

## Contextualised skill acquisition research : a new framework to study the development of sport expertise

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20

## Abstract

21 Objective: Research on expertise in sport has rarely attempted to examine socio-cultural  
22 constraints on athletes. Here, we outline a new contextualised approach to studying socio-  
23 cultural constraints on individuals, proposing an interpretive, multi-method approach to  
24 holistically investigate the interacting constraints on an athlete's development pathway.

25 Aims: We explain a rationale for adopting an interpretive research paradigm (in contrast to  
26 traditional positivist approaches) for exploring socio-cultural constraints. The epistemological  
27 and methodological assumptions of Bronfenbrenner's Bioecological Model of Human  
28 Development are proposed as an underpinning framework for data collection and  
29 organisation of material. We advocate for ethnographic strategies of inquiry, followed by a  
30 discussion of potential methods for generating and analysing data: contextual analysis,  
31 participant-observation, and open-ended interviews. Finally, we discuss evaluation criteria for  
32 this contextualised approach viewed from a coherence theory of truth.

33 Purpose: This position statement seeks to: 1) promote methodological possibilities to  
34 investigate the effect of socio cultural constraints on expertise acquisition in sport; and 2),  
35 offer significant new theoretical and epistemological insights from the constraints-led  
36 approach to expertise and to integrate some of the interdisciplinary differences that exist in  
37 the body of sciences.

38

39 Keywords

40 socio-cultural constraints, ethnography, constraints-led approach, bioecological model,  
41 coherence theory of truth

42

## 43 **Introduction**

44 The acquisition of perceptual-motor expertise in different performance domains (e.g.,  
45 clinical, physical education, music, sport coaching) is a complex, contextualised process.  
46 Theoretically, the constraints-led<sup>1</sup> approach to motor learning has provided major insights,  
47 mainly from empirical research on individual and task constraints (see 2008). However, there  
48 is a need to further explore the socio-cultural environmental constraints of this model.  
49 Environmental constraints that impinge upon a learner's development are multiple,  
50 intangible, intertwined and dynamic (Davids et al. 2013). To understand such processes, a  
51 broad, yet sensitive set of research tools is required. Motor learning research has traditionally  
52 persevered with a relatively narrow range of research tools emanating from a long history of  
53 a positivistic, laboratory-based research paradigm. Such tools seem suitable for investigating  
54 how unique personal constraints interact with task-related factors in the skill acquisition  
55 process (Araújo and Davids 2011). However, for the study of socio-cultural constraints, other  
56 methodologies may be more functional.

57 On a day-to-day basis, physical education and sports coaching practitioners are  
58 confronted with learners whose personal experiences and attributes have been shaped by the  
59 socio-cultural constraints that surround them. Movement preferences, individual differences  
60 and nonlinear rates of development are as much a function of social milieu in which learners  
61 have developed as they are of an individual's physiology, anatomy or psychology. Here, we  
62 highlight the importance of socio-cultural constraints during learning and argue that  
63 practitioners and researchers would benefit from greater awareness of their influence.

64 We propose contextualised skill acquisition research as a new research framework  
65 that is relevant for examining the nature of interacting, dynamic socio-cultural constraints on  
66 expertise acquisition. In advocating exploration of socio-cultural constraints via this

67 methodological framework, we also hope to offer new epistemological insights on how to  
68 integrate quantitative and qualitative research approaches, as well as positivist and  
69 social/interpretive research paradigms. We are not the first to propose a potential solution for  
70 these limitations of kinesiology and physical education (e.g., Ingham 1997; Andrews 2008).  
71 Andrews et al. (2013) paint an explicitly socially critical vision for kinesiology – under the  
72 aegis of Physical Cultural Studies as: “an interdisciplinary field ground within a critical  
73 curriculum of the corporeal that draws on a range of exciting and innovative methodologies  
74 that can provide the languages of, and possibilities for, a politically progressive, socially just,  
75 and democratic citizenry.” Although not grounded in critical paradigms and political projects  
76 in precisely the same way, we too envisage future possibilities in which biophysical sciences  
77 and socio-cultural sciences may be inextricably linked. We acknowledge that our tentative  
78 contribution to the development of this new paradigm is to build bridges across the  
79 methodological boundaries between sociology and motor learning in the first instance, rather  
80 than offering a unifying approach for the whole field.

81 Our aim here is to construct a rationale for contextualised skill acquisition  
82 exemplified by philosophical, theoretical and methodological foundations (see Table 1). The  
83 scope of this paper is limited to justification and explanation of the new contextualised skill  
84 acquisition approach. Later in this position paper, we will refer to the first author’s PhD  
85 research programme to clarify how contextualised skill acquisition processes can be  
86 investigated. The specific purpose of this position statement is to provide a foundation for  
87 future empirical papers on this topic and to stimulate other researchers to consider the  
88 framework.

89 Insert Table 1 about here

90 **Philosophical Foundations of Contextualised Skill Acquisition Research**

91 Research in the related sub-disciplines of movement science and motor learning has  
92 burgeoned over the past five decades (Button and Farrow 2012). Traditionally, studies in this  
93 area have been guided primarily by methods of quantitative inquiry (Mullineaux, Bartlett, and  
94 Bennett 2001), underpinned by philosophical assumptions of the positivist paradigm (see  
95 Abernethy and Sparrow 1992). Laboratory-based research has been ubiquitous in this  
96 positivist approach, where experimental design and methods are rigorously controlled.  
97 Traditional analyses have been limited to movement models involving few motor system  
98 degrees of freedom (i.e. joints, muscles, body segments). A considerable challenge for  
99 researchers is to apply the data and models of motor learning, developed with such  
100 laboratory-based tasks, to the study of behavioural phenomena in sport performance and  
101 learning environments (Davids et al. 2006). On a broader but related note, there are  
102 increasing concerns that the field of kinesiology has become too fragmented and that the  
103 current positivist hegemony may be restricting our understanding of human behaviour. An  
104 implication of traditional approaches is the marginalisation of the study of the broader  
105 socio-cultural contexts and problematics of human performance and learning (e.g., Andrews  
106 2008; Larsson and Quennerstedt 2012).

107         These issues raise a number of philosophical challenges. While there has been a lot of  
108 quantitative research on informational and instructional constraints on action (e.g., Renshaw  
109 et al. 2010), there is a paucity of qualitative research addressing socio-cultural constraints in  
110 the environment (Araújo et al. 2010). It is beyond the scope of this article to fully explicate  
111 the foundation of positivism, as well as other philosophical orientations, but we briefly  
112 highlight and contrast key paradigmatic concepts to discuss how future research might be  
113 guided.

114 **Positivist, Quantitative Paradigms**

115 Historically, positivism has been the dominant paradigm in many different academic  
116 disciplines (see Sparkes 1992). The positivist paradigm is conceptualised according to realist  
117 external ontology, objectivist epistemology, and experimental/manipulative methodology. A  
118 major assumption is that a singular reality exists independent of the researcher and that it  
119 operates according to natural laws. Thus, the aim of science is to objectively elucidate such a  
120 reality through controlled manipulations by the inquirer, while attempting to avoid biases by  
121 controlling unwanted interference. In addition, rigorous controlled experimental conditions  
122 are used to yield a valid and reliable nomothetic research programme that can test pre-  
123 conceived hypotheses and assumptions underpinned by theoretical frameworks (Guba 1990).  
124 The field of motor learning readily adopted such assumptions from its parent discipline of  
125 experimental psychology as it sought to establish itself as a valid, rigorous field of study in its  
126 own right (Abernethy and Sparrow 1992).

127         The positivist paradigm leans toward quantitative modes of data collection, through  
128 which deterministic relationships of cause and effect are sought in order to report outcomes  
129 that can be generalised and representative (see Denzin and Lincoln 2005; Guba 1990).  
130 However, in the last few decades many qualitative researchers have been critical of this  
131 reductive model that is premised on being independent of cultural context and politically  
132 neutral when it is applied to the infinite, multiply layered complexities of the social world. A  
133 key question concerns how movement cultures are the product of social, economic and  
134 historical contexts.

### 135 **Interpretive, Qualitative Paradigms**

136 Andrews (2008) rejects the notion that socio-cultural constraints can be productively  
137 investigated in the same objective way as the natural sciences. Indeed, the richly complex,  
138 socio-cultural contexts in which skill acquisition occurs contains a plethora of unconventional

139 ‘variables’ that can be best illuminated from an interpretive perspective. Specifically, this  
140 interpretive approach is centred upon understanding phenomena within, not independent of  
141 their social context.

142 Qualitative research, however, is not a unified ‘church’, but cuts across disciplines  
143 and fields and encompasses different methods, strategies of inquiry, and paradigms (Table 1).  
144 It has a long history and tradition in the humanities, sociology and cultural anthropology  
145 (Denzin et al. 2000). On a philosophical level, Denzin et al. (2005) proposed that qualitative  
146 research is located on a continuum between postpositivism at one extreme and  
147 poststructuralist perspectives at the other. The closer research is to postpositivism, the more  
148 realist and objectivist it will be<sup>1</sup>. In contrast, the closer research is situated to  
149 poststructuralism, the more relativist and subjectivist the research will be<sup>2</sup> (see Denzin et al.  
150 2005).

151 Across the qualitative spectrum, there are several paradigms that have undergirded  
152 qualitative research in physical education (see Sparkes 1992). Pertinent to our multi-method  
153 approach is the interpretive paradigm. Interpretivists adopt an internal-idealist ontology and a  
154 subjectivist epistemology (see Table 1). The internal-idealist ontology takes reality to be  
155 mind-dependent. Consequently, mind and object cannot be separated, signifying that ‘the  
156 knower and the process of knowing cannot be separated from what is known and we can  
157 never hope to see the world outside of our place in it’ (Sparkes 1994, 13). Further,  
158 interpretivists believe that there are multiple realities, which means that an inquiry must  
159 engage multiple interpretations (Sparkes 1992). With regard to the subjectivist epistemology,

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<sup>1</sup> Postpositivists believe that reality exists, as positivists do. But such reality is imperfectly attainable due to the inevitable influence of the researcher (for further details, see Guba 1990).

<sup>2</sup> Poststructuralism refers to a school of thought that is very similar to the theoretical perspectives of postmodernism (Fawcett 2008). “One general distinction (with many exceptions) is that poststructuralism tends to be more abstract, more philosophical, and less political, than postmodernism” (Ritzer 1997).



160 reality is constructed and sustained through the meanings and actions of the individual and  
161 the researcher interacts and personally engages in the process of investigation (Sparkes  
162 1992). Therefore, the researcher is the main research tool, which differs to positivism where  
163 the main tool of investigation is typically a detached technical instrument, such as, for  
164 example, a highly structured questionnaire or a high-speed camera to film skill performance  
165 (Sparkes 1992). Interpretivists believe that investigated phenomena, and hence data, cannot  
166 be understood in an objective way, but are subject to interpretation.

167         In summary, the traditional philosophical paradigms that have been adopted by skill  
168 acquisition researchers (i.e., positivist, objective) have arguably created an organismic  
169 asymmetry (Davids & Araújo, 2010) in which the role of the learning environment has been  
170 underemphasised. Furthermore, the traditional reductionist tendency to consider factors in  
171 isolation does little to capture the richness of the complex interactions that typify an athlete's  
172 world. A less radical and arguably more practical message, however, is that when it comes to  
173 choosing between either qualitative or quantitative research paradigms, one is not superior to  
174 the other. Rather each provides a different means with which to conduct research. This is the  
175 position adopted in our current programme of work investigating socio-cultural constraints on  
176 the acquisition of expertise in sport. It also aligns with the views of Silverman (2006 ), who  
177 stated that 'the choice between different research methods should depend upon what you are  
178 trying to find out' (p. 34). These ideas suggest that movement scientists need to consider how  
179 a range of interpretive, qualitative philosophies can provide added benefit when examining  
180 skill acquisition.

### 181 **Theoretical Foundations of Contextualised Skill Acquisition Research**

182 In recent decades, the dominant research philosophy within motor learning has been  
183 questioned through emerging theories, namely ecological psychology and dynamical systems

184 theory under the umbrella of the constraints-led approach (see Davids, Button & Bennett,  
185 2008). The framework of ‘ecological dynamics’ conceptualises movement coordination as an  
186 emergent property resulting from interacting individual, task, and environment constraints  
187 (Seifert, Button, and Davids 2013). As indicated in Table 1, researchers have also advocated  
188 strongly for representative design, resulting in a better understanding of the information  
189 needed to be included in empirical investigations, whether in the field or laboratory (Pinder et  
190 al. 2011). However, whilst theoretical advances such as representative design have had a  
191 positive impact within the motor learning discipline, the influence of the environment, and in  
192 particular socio-cultural constraints, upon learning have yet to be fully elucidated. The social  
193 and historical “context” in which skill acquisition occurs is still undervalued in empirical  
194 investigations.

195 Urie Bronfenbrenner (1995) proposed an important model which may help to  
196 strengthen the theoretical basis of ecological dynamics. In general terms, the bioecological  
197 model conceives human development as function of the interaction between nature and  
198 nurture (see Krebs 2009). Under the notion of contextualisation, mutual co-determination  
199 between individual and context provides common ground between the bioecological  
200 approach and the constraints-led approach to skill acquisition (Davids et al. 2008). The  
201 mutual interactions between performers and context create an ecological dynamic which can  
202 eliminate the organismic asymmetry (bias towards the person) typical of traditional research  
203 approaches in the behavioural sciences (Davids and Araújo 2010). In addition, within the  
204 parameters of contextualisation, analysis cannot be maintained with a linear deterministic  
205 focus. For this reason, Bronfenbrenner advocated that environmental properties cannot be  
206 ‘distinguished by reference to linear variables but analysed in systems terms’ (Krebs 2009,  
207 117).



232 interaction...’ (626). A contextualised historical analysis recognises these proximal processes  
233 and their evolution over time, as non-linear idiosyncratic interactions between athlete and  
234 environment, which co-constrain skill development. Clearly each individual has the capacity  
235 to influence proximal processes through their unique experience and attributes.

236         The second component of the Bioecological Model is the person, analysed by means  
237 of his/her biopsychological characteristics developed during person-environment interactions  
238 (Bronfenbrenner and Morris 1998). As a specific example, (Stattin and Magnusson 1990)  
239 illustrate person-environment interactions by assessing the implications of the biological  
240 maturation rate for the developmental process of females. They showed that the behavioural  
241 patterns (social adaptation) of post-pubescent girls were related to factors such as age of  
242 menarche and association with older, working boys. The authors acknowledge that to  
243 understand the role of biological factors on personal development one must also consider  
244 mental factors and environmental factors simultaneously.

245         The third component of the bioecological model is context. In human development,  
246 context is emphasised as a joint function of characteristics of the person and the environment.  
247 It ‘encompasses the physical, social, and cultural features of the immediate settings in which  
248 human beings live (e.g. family, school, and neighbourhood) as well as the still broader  
249 contemporary and historical context in which an individual is born (Moen 1995). Steinberg et  
250 al. (1995) recognised the importance of context in analysing parenting style on youngsters’  
251 development. They suggest that although authoritative parenting “works”, in that adolescents  
252 typically fare better when their parents behave this way, it works better in some contexts than  
253 others. In certain ecologies, proximal processes outside the control of parents may entirely  
254 overwhelm the benefits of authoritative parenting (Steinberg, Darling, and Fletcher 1995).

255           Bronfenbrenner conceptualised the environment in terms of nested systems of four  
256 levels: microsystem (e.g. family support), mesosystem (e.g. training facility), exosystem (e.g.  
257 demography), and macrosystem (e.g. national historical context) (see Krebs 2009). These  
258 systems can be conceived of as a fitting concentric structure, each containing the other,  
259 forming the ecological environment (see Figure 1).

260           The microsystem is the innermost level in which the developing person is directly  
261 involved in activities, roles, and interpersonal relationships with the immediate physical,  
262 social and symbolic features of their environment. In a microsystem, the mechanism of  
263 proximal process functions to initiate development, but its quality depends on structure and  
264 content of the microsystem (Bronfenbrenner et al. 1998). To exemplify, interactions between  
265 family, school, clubs, and neighbourhood in a particular society will shape the quality of a  
266 child's development. Domingues & Gonçalves (2012) demonstrated how the bioecological  
267 model can be used to help influence how environmental practices and significant others  
268 operate over time to shape sport experiences. In contrasting social and youth football club  
269 settings, they observed that sport can be a social mechanism of change which can reduce anti-  
270 social, delinquent behaviours and develop close relationships between athletes, coaches and  
271 significant others.

272           The mesosystem is a system of microsystems. When a person transits from one  
273 microsystem to another, a mesosystem is created. A mesosystem entails interrelations  
274 emerging between two or more settings containing the developing person. In other words,  
275 interactions of a person in one place, (e.g., workplace) are influenced by interaction with other  
276 contexts, such as the family (see Bronfenbrenner 1979; Krebs 2009).

277           The exosystem comprises the settings in which the developing person participates,  
278 including at least one which does not contain that person, but in which events occur that

279 indirectly influence the person's development (Bronfenbrenner 1979; Krebs 2009). Three  
280 important exosystems that are likely to indirectly affect the development of children and  
281 youth are the parents' workplace, and the family social network, and neighbourhood-  
282 community. In line with these ideas, it's worth noting that previous researchers in skill  
283 acquisition have reported how certain characteristics of a neighbourhood community, such as  
284 population size of a city, may influence expertise acquisition in sport (see Carlson 1988).

285         The last level of the nested system is the macrosystem which embraces all the possible  
286 linkages amongst microsystems, mesosystems and exosystems. This system was defined by  
287 Bronfenbrenner (2005) as 'the overarching pattern of micro, meso-, and exosystems  
288 characteristics of a given culture, subculture or other broader social context'. As such the  
289 macrosystem level includes a range of putative influences (such as political, economic, and  
290 sociocultural) upon the developing individual which are undeniably present but rarely  
291 considered within the context of motor learning. For example, the broad macrosystem  
292 dimension may help us to describe and interpret historical playing styles, cultures and  
293 stratifications that characterise certain sports and nations (e.g., New Zealand rugby union,  
294 Brazilian football, Australian rules football, Indian cricket, American basketball, Russian  
295 gymnastics, and Nordic winter sports).

296         The final component of the Bioecological system is time, which permits an analysis of  
297 both '...the historical period through which a person lives [and the] ...timing of biological  
298 and social transitions as they relate to the culturally defined age, role expectations, and  
299 opportunities occurring throughout the life course' (Bronfenbrenner 1995, 641).  
300 Bronfenbrenner and Morris (1998) classified time into three levels: micro-time, meso-time  
301 and macro-time. These different timescales distinguish between the rapid discontinuities  
302 associated with certain momentary proximal processes (micro), the regular periodicity of

303 other interactions over days, weeks and months (meso), in contrast to the more gradual  
304 evolution of other episodes that may occur over a lifespan (macro).

### 305 **Methodological Foundations of Contextualised Skill Acquisition Research**

306 To summarise so far, contextualised skill acquisition research can be conceived of as a  
307 general framework to identify and classify key constraints on an athlete's development.

308 Although many scholars have attempted to apply the bioecological model in new research  
309 designs (see Moen et al. 1995), the model has seldom been used to examine skill acquisition  
310 processes (Krebs 2009). It is possible that a lack of familiarity with qualitative research  
311 methods has hindered application of Bronfenbrenner's model, particularly in sports science  
312 (Mullineaux, Bartlett & Bennett, 2001). However, according to Krebs (2009, p. 123)

313 "Bronfenbrenner's bioecological model offers a possibility to use new research designs to  
314 conduct better investigations to assess the athlete's personal attributes". In a similar line of  
315 focus, Salmon and Timperio (2007) highlighted that more multilevel study designs that  
316 incorporate various dimensions (i.e., PPCT) of Bronfenbrenner's model are needed. Gabbard  
317 and Krebs (2012) go one step further providing two examples on how the PPCT model might  
318 be applied by motor learning researchers. The first suggested line of research concerns  
319 environmental influences on fundamental motor skill ability and later physical activity level  
320 in children. The second line of enquiry addresses the relationship between motor  
321 development and cognitive ability (for further details see Gabbard and Krebs 2012).

322 More pertinent to the examples used in this article, Araújo et al.'s (2010) study  
323 exemplifies how to perform qualitative research to investigate the role of ecological  
324 constraints on the development of Brazilian footballers. Findings were interpreted and  
325 organised by the nested contextualised systems of Bronfenbrenner's model. For instance, the  
326 following constraints identified as unstructured practice environment (micro), training

327 quality (micro) and family support (meso), birth of location (exo), and poverty (macro) were  
328 organised under the scope of the different systems of Bronfenbrenner's model.

329 However while Araújo et al. (2010) provide an important contribution on how to address and  
330 investigate socio-cultural constraints influencing expertise development, their scope was  
331 limited by an empirical design which only included a document analysis form of inquiry. As  
332 such, it lacks on explaining how the environment is connected with individual and vice-versa.

333 This paper proposes a framework that addresses this issue by relating the different  
334 environmental dimensions (e.g. the macrosystem) with individual's lived experiences. To  
335 achieve that, we propose an extensive thorough investigation by using other forms of  
336 qualitative inquiries such as interview and participant-observation. Thus, contextualised skill  
337 acquisition research follows the initial steps taken by Araújo et al. (2010) but extends that  
338 work by using the bioecological model to organise prospective findings from different  
339 aspects of qualitative research inquiry (see further details on the ethnographic section below).  
340 Next, we shall demonstrate how the bioecological model can be applied to identify  
341 constraints that affect development of expertise of perceptual motor skills of Brazilian  
342 football players.

### 343 **Researcher as a Tool and as a Bricoleur**

344 As discussed earlier, direct and active involvement of researchers is a key characteristic of  
345 interpretivism. The researcher's personal background needs to be acknowledged so 'the  
346 audience can better understand the topic, the setting, or the participants and the researcher's  
347 interpretation of the phenomenon' (Creswell 2009).

348 An example taken from the first author's current doctoral programme is helpful to  
349 consider at this point. As such the narrative of this article will temporarily transit to the first  
350 person. In my PhD research programme, I (first author) aim to adopt the contextualised skill



351 acquisition approach to examine the development of football players in Brazil. As a Brazilian  
352 myself, I understand that my personal, cultural, and historical experiences inevitably shape  
353 how I approach fieldwork, interact with participants, and interpret findings. Throughout my  
354 analysis, my background will be acknowledged so that readers understand the dialogic  
355 interpretation of the empirical findings emerging from field notes (participant-observation)  
356 collected at different venues as well as from interviews conducted with players, coaches and  
357 other relevant people. To make sense of their understanding of how football players in Brazil  
358 acquire relevant perceptual-motor skills, I inductively explore their views and subsequently  
359 attempt to develop a theory or patterns of meanings. In doing so, my secondary aim is to  
360 offer a methodological and epistemological framework for investigating effects of socio-  
361 cultural-historical constraints on skill acquisition.

362         To achieve this aim, I need to proceed as a bricoleur. In qualitative research terms, a  
363 bricoleur implies a qualitative researcher who can draw coherently from multi-disciplinary  
364 perspectives, distinct theoretical and philosophical orientations, and various methods of  
365 inquiry in order to interpret a complex phenomenon generated by complex variables, such as  
366 those evidenced in socio-cultural studies (see Denzin et al. 2005).

367         Bricolage supports an adequate multi-method approach that can inform the parameters  
368 of interpretive inquiry. In the context of Brazilian football these include: music; dancing;  
369 social inequalities; education; and even corruption that are embedded in Brazilian culture.  
370 These socio-cultural constraints are important because they affect skill acquisition within  
371 Brazilian football, leading players to infuse their movement coordination processes with  
372 unique characteristics such as the idea of playing with *ginga* (sway), flamboyance and flair.  
373 Thus, my principal challenge is how to analyse and integrate these constraints that  
374 anecdotally have been at the root of the development of the skills of Brazilian football  
375 players?

376 To effectively conduct such an analysis, it is necessary to employ a multi-qualitative  
377 approach that offers suitable theoretical and methodological insights to excavate linkages  
378 between socio-cultural environmental forces and cultural and corporeal practices of Brazilian  
379 footballers. Further, such analyses have to be historically contextualised so that meaningful  
380 interpretations of the acquisition of expertise in football can be made in Brazil.

381 Contextualised skill acquisition research requires a bricolage that intertwines epistemological  
382 and methodological concepts from the following: Bronfenbrenner's bioecological model of  
383 human development, ethnography, and the coherence theory of truth.

#### 384 **Ethnographic Strategy of Inquiry**

385 In its most basic sense, ethnography refers to a 'sketch' of life in its everyday lived context.

386 Ethnographic strategies are influenced by Paul Willis' (2000) notion of '*the ethnographic*  
387 *imagination*', which involves the subjectivity and bias of the researchers; practical criticism,  
388 rather than being only descriptive; and analysis of lived everyday culture from different  
389 sources. As Willis (2000) pointed out '... [the] ethnographic imagination is relevant to the  
390 production of all kinds of intellectual work. Non-field-based writing and intellectual work  
391 can certainly inform the crafts and methods of ethnography' (113). Thus, under the umbrella  
392 of the ethnographic imagination, methods of data collection and analysis consider 'the  
393 importance of maintaining a sense of the investigator's history, subjectivity and theoretical  
394 positioning as a vital resource for the understanding of, and respect for, those under study'  
395 (Willis 2000, 113).

396 To describe the ethnographic data collection methods undertaken by the first author, it  
397 is appropriate once more to adopt the first person narrative. I shall highlight the methods  
398 employed for my doctoral studies: contextual analysis (conducted prior to field-work in  
399 Brazil); participant-observation, and unstructured interviews (conducted during field-work in

400 Brazil). These three methods are complementary and interrelated meaning that they do not  
401 follow a one-way linear path in the analysis. Rather, it was a nonlinear, non-sequential  
402 research process based on the notion of reflexivity described by Dowling (2008). From this  
403 view, I had to reflexively move back and forth between the methods, theories and paradigms  
404 in order to adjust and in turn enhance the quality of empirical procedures. Each of these  
405 methods are discussed below beginning with contextual analysis which is predominantly  
406 informed by written texts (document analysis) regarding the social history of Brazilian  
407 football as well as the general history of Brazil.

#### 408 **Contextual Analysis**

409 Contextual analysis investigates the socio-cultural context in which a phenomenon has been  
410 historically constructed. The historical, economic, political, socio-cultural context in which  
411 acquisition of football expertise in Brazilian players occurs is significant for this  
412 investigation. Indeed, the historical contextual analysis was required to reconstruct a number  
413 of socio-cultural and political-economic sites of articulation – that is, how these pressures and  
414 contexts interact to shape patterns – of Brazilian football in order to inform the participant  
415 observation and interview methods. From a methodological viewpoint, such analysis has  
416 been useful in informing what data should be collected in the field. In contrast, given the  
417 exploratory nature of the present research, emerging data from fieldwork may also be used to  
418 inform what should be added or changed to the contextual analysis as the research proceeds.

#### 419 **Participant Observation**

420 Fieldwork in the form of participant-observations, or sometimes only observations, was  
421 performed in São Paulo, Brazil in 2011. Through my contacts as a former player in this  
422 region and current football agent, I gained access to a professional football club called  
423 Paulista FC, a football school affiliated with São Paulo FC, and to a football pelada in a

424 favela called Vila Ana. I also took notes from children playing informal football in parks and  
425 streets of my hometown Jundiai.

426 The parameters used around the chosen locations for data collection were based on  
427 contemporary commentaries regarding the ‘History of Brazilian football’, which shows that  
428 many successful players emerged from underprivileged suburbs around Brazil. Before they  
429 were scouted and sent to a club, they used to make and improvise their own playing field,  
430 whether it was on the street, waste ground, or beach (see Goldblatt 2006; Taylor 1998).

431 To be able to scrutinise the topic and generate rich and relevant evidence, I was  
432 prepared to collect data from whatever and whoever provided an opportunity, be it from  
433 structured or non-structured settings, professional or non-professional people related to  
434 football. However, fieldwork practice was limited by the funding available and also by  
435 accessibility in Brazil. In this sense, growing up in the city of Jundiai, province of São Paulo,  
436 I was privileged to gain access to football professionals and clubs in the local area that would  
437 not have occurred in other regions. There, I started with two key gatekeepers (i.e. contacts)  
438 **who** helped to “open the door” to this world by introducing me to the right people. Through a  
439 snowball sampling technique (i.e. one person indicates other(s)) accessibility was further  
440 expanded (see Patton 2002).

#### 441 **Open-Ended Unstructured Interview**

442 Concurrently with the participant observation fieldwork, a face to face unstructured open-  
443 ended interview technique was undertaken. In order to maximise the exploration of this topic,  
444 I asked open-ended questions, eliciting the views and opinions of participants (see Denzin, et  
445 al. 2000; Patton 2002). **As an example, when the topic of socio-cultural such as dance,**  
446 **poverty (etc.) was brought into the discussion, I then asked: “Tell me about how you perceive**  
447 **the relationship between dance and Brazilian football?” Depending on the response received,**

448 I could be more specific and probe further: “Tell me about how you perceive the effect of  
449 samba on the development of skills of Brazilian football players?” As such the broad macro-  
450 level dimension of samba as a socio-cultural constraint in Brazil can be explicitly linked with  
451 each individual’s lived skill experiences. Bear in mind that, as explained above, such topics  
452 and lines of questioning were informed by the historical-context analysis performed prior to  
453 the field work in Brazil.

454         Given the open-ended nature of this study, the amount of data collection required to  
455 make this study coherent was based on the parameters of ‘point of saturation’ or the point  
456 where new information no longer emerges (Lincoln and Guba 1985). This is important  
457 because, if the amount of data is insufficient, then important information may be missed,  
458 providing an incomplete exploration of the topic. On the other hand, if data were  
459 oversaturated, then redundant information will be displayed (see Patton 2002).

#### 460 **Evaluation in the form of Coherence Theory of Truth**

461 Having described some of the methods that can be used to conduct a contextualised skill  
462 acquisition research study, our final task is to explain how the quality of the research can be  
463 evaluated. Paradigmatic differences that influence the way that research is conducted result in  
464 different ways of evaluating the quality and adequacy of research. With regard to the  
465 evaluation of the positivist research paradigm, key gauges are validity and reliability. Validity  
466 is the degree to which a test or instrument measures what it purports to measure. Whereas,  
467 reliability refers to acceptable agreement between repeated tests made under similar  
468 conditions (Thomas and Nelson 2001). In order to achieve valid and reliable research,  
469 positivists adhere to a correspondence theory of truth, by which ‘true statements are those  
470 that are judged to have accurately reflected the qualities and characteristics of what are out  
471 there’ (Sparkes 1994, 23). Thus, ‘reality’ can be understood by the correct application of

472 formalised methods, such as, highly structured questionnaires, essential in ensuring validity  
473 and reliability. This application permits the separation of personal opinions from the object of  
474 study (Sparkes 1992).

475         In qualitative research evaluation criteria are underpinned by the interpretive  
476 paradigm, in which validity and reliability are substantively reframed in a subjective  
477 epistemology. That is, the researcher is observing and interviewing participants in their  
478 natural settings, and given that he or she is the main tool, there are no reliability and validity  
479 coefficients for the researcher (Brow 1988, cited in Sparkes 1992).

480         In order to evaluate research, interpretivists adhere to a coherence theory of truth  
481 whereby “the basis of truth or trustworthiness is social agreement; what is judged true or  
482 trustworthy is what we can agree, conditioned by time and place, is true or trustworthy”  
483 (Sparkes 1992, 30). Within a coherence theory of truth, one event can have many co-existing  
484 interpretations so that a richer and broader view of a culture is given (Sparkes 1994).  
485 However, this multiple interpretation might be challenging for researchers studying culture to  
486 agree on the most correct interpretation (Sparkes 1994, 14). Such a problem falls within the  
487 notion of relativism, which generally challenges the notion of the legitimacy of a single  
488 reality or absolute truth. From a relativist researcher’s point of view, truth of a phenomenon  
489 is subjectively constructed by the writer and ultimately by readers of the research.

490         Despite these issues, the coherence theory of truth is best equipped for purposes of the  
491 interpretive paradigm and qualitative philosophical assumptions of this research approach. In  
492 applying the coherent theory of truth as an attempt to ensure the quality and adequacy of  
493 research, this approach draws upon an eclectic body of theoretical informants and research  
494 strategies, including the concept of contextualisation, ethnographic strategy of inquiry



519 examination and explanation of how they have influenced a research project (747)'. With this  
520 in mind, throughout the development of this project I have continuously questioned the  
521 methodological decisions made so that, if necessary, I can adjust my research focus without  
522 necessarily losing the purpose of it. For example, under constant thorough investigation and  
523 reflective actions, a multi-methodology approach has been employed to explore the present  
524 research.

525         Finally, in order to make the notion of reflexivity meaningful, it is crucial to take into  
526 consideration one of the key aspects of qualitative methods of inquiry: the researcher  
527 him/herself. As can be seen, the researcher has a key role in making ontological,  
528 epistemological and methodological decisions, and his/her experience and background  
529 inevitably influences the analysis and interpretation of the research. The role and background  
530 of the researcher has to be acknowledged in advance so readers can interpret the researcher's  
531 interpretation of the practice and beliefs of others, and make their own "truth" conclusions.  
532 Accordingly, I have reflected, examined, and as highlighted earlier, explained how my  
533 Brazilian background and subsequent experience living overseas may influence the way that I  
534 will dialogically/dialectically interpret this research.

## 535 **Discussion and Conclusions**

536 In this article we have proposed a novel research framework (contextualised skill acquisition  
537 research) that has considerable potential for analysis of socio-cultural constraints upon skill  
538 acquisition. We signalled the need to extend beyond positivist research philosophies in order  
539 to investigate unconventional variables in motor learning. We also justified why the  
540 interpretive paradigm and its qualitative research tools are best suited this purpose.  
541 Bronfenbrenner's Bioecological model has considerable value to help decide what factors  
542 and processes to consider and how best to organise material into suitable levels. To underpin



543 the parameters of this approach, we provided an account of the subjectivist focus of the study,  
544 the function of the multi-method approach employed, and a researcher's role as a bricoleur  
545 for dialogical interpretations. Finally, we explained the coherence theory of truth as the  
546 evaluation criteria employed to maximise the quality or credibility of findings. We also  
547 discussed the process of reflexivity, in which researchers need to continuously reflect and  
548 analyse all phases of research so that epistemological and methodological adjustment can be  
549 made as a means to raise a meaningful interpretation.

550 Overall, it is proposed that this framework will contribute to the epistemological,  
551 theoretical and methodological knowledge across the sub-disciplines of motor learning and  
552 sociology. In particular the approach provides researchers with the tools/rationale to link  
553 different systems within which an individual develops. As such an enriched understanding of  
554 the individual's lived experiences within the broader social, geographical, historical (etc.)  
555 context can be reached. In practical terms, the proposed approach may benefit understanding  
556 of processes of skill acquisition, talent identification and athlete development. The  
557 limitations, however, suggest that practical implications of the framework may not be directly  
558 obvious to teachers, coaches and professionals alike. Indeed to influence either social or  
559 cultural influences on the learner is not a simple process due to the extended timescales over  
560 which such variables act. Moreover, results viewed from interpretive paradigms can have  
561 multiple interpretations and unlike traditional research in motor learning, results cannot be  
562 generalised. It is our hope that this article will provoke feedback, discussion and possibly  
563 inspire others to consider the contextualised skill acquisition research framework in the  
564 future.

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567 **References**

- 568 Abbott, A.J., C. Button, G-J. Pepping, and D. Collins. 2005. Unnatural selection: Talent  
569 identification and development in sport. *Nonlinear Dynamics, Psychology and Life*  
570 *Sciences*. 9 (1):61-88.
- 571 Abernethy, B., and W.A. Sparrow. 1992. The rise and fall of dominant paradigms in motor  
572 behaviour research. *Advances in Psychology* 84:3 - 45.
- 573 Andrews, D. L. 2008. Kinesiology's inconvenient truth and the physical cultural studies  
574 imperative. *Quest* 60:46-63.
- 575 Araújo, D, and K Davids. 2011. What exactly is acquired during skill acquisition? *Journal of*  
576 *Consciousness Studies* 18 (3-4):7-23.
- 577 Araújo, D, C Fonseca, K Davids, J Garganta, A Volossovitch, R Brandao, and R. Krebs.  
578 2010. The role of ecological constraints on expertise development. *Talent*  
579 *Development & Excellence* 2 (2):165-179.
- 580 Bronfenbrenner, U. 1995. Developmental ecology through space and time: A future  
581 perspective. In *Examining lives in context: Perspectives on the ecology of human*  
582 *development*, edited by P. Moen, G. H. Elder and K. Luscher. Washington, DC:  
583 American Psychological Association.
- 584 Bronfenbrenner, U. 2005. Bioecological theory of human development. In *Making human*  
585 *being human: Bioecological perspectives on human development*, edited by U.  
586 Bronfenbrenner. Thousand Oaks, CA: Sage Publication, Inc.
- 587 Bronfenbrenner, U, and P Morris. 1998. The ecology of developmental process. In *Handbook*  
588 *of child psychology: Vol. 1. Theoretical models of human development*, edited by W.  
589 Damon and R. M. Lerner. New York: John Wiley.

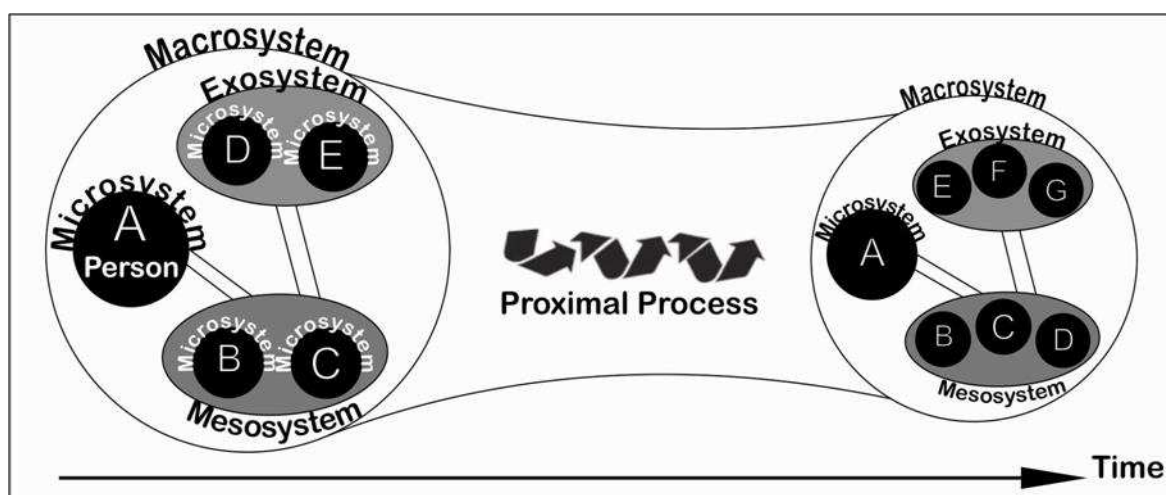
- 590 Bronfenbrenner, U, and P Morris. 2006. The bioecological model of human development. In  
591 Handbook of child psychology: Vol. 1. Theoretical models of human development,  
592 edited by W. Damon and R. M. Lerner. New York: John Wiley.
- 593 Button, C, and D. Farrow. 2012. Working in the field (Southern Hemisphere). In Skill  
594 aquisition in sport, edited by N. J. Hodges and A. M. Williams. London: Routledge.
- 595 Carlson, R. C. 1988. The socialization of elite tennis players in Sweden: An analysis of the  
596 players' backgrounds and development. *Sociology of Sport Journal* 5:241 - 256.
- 597 Creswell, J.W. 2009. Research design: Qualitative, quantitative, and mixed methods  
598 approaches. Edited by 3. Thousand Oaks: Sage Publications.
- 599 Davids, K, and D Araújo. 2010. The concept of 'organismic asymmetry' in sport science.  
600 *Journal of Science and Medicine in Sport* 13 (6):633 - 640.
- 601 Davids, K, C Button, I Renshaw, D Araújo, and R Hristovski. 2006. Movement models from  
602 sports provide representative task constraints for studying adaptive behavior in human  
603 motor systems. . *Adaptive Behavior* 14 (1):73-95.
- 604 Davids, K, C. Button, and S. Bennett. 2008. Dynamics of Skill Acquisition: A Constraints-Led  
605 Approach. Champaign, IL: Human Kinetics.
- 606 Davids, K, R Hristovski, D Araújo, N Balaque-Serre, C Button, and P Passos. 2013.  
607 Complex systems in sport. London: Routledge.
- 608 Davis, C. S. 2008. Representation. In *The sage encyclopedia of qualitative methods*, edited by  
609 L. M. Given. Los Angeles: Sage Publications, Inc.
- 610 Denzin, N.K. 1989. Interpretive interactionism. Newbury Park, CA: Sage Publications.
- 611 Denzin, N.K, and Y.S Lincoln, eds. 2005. The sage book of qualitative research. Thousand  
612 Oaks: Sage Publications.

- 613 Domingues, M., and C.E Gonçalves. 2012. Social sport club and youth sport expectations:  
614 Personal and social determinants in contrasting ecologies of practice. *American*  
615 *Journal of Human Ecology* 1 (3):71-78.
- 616 Dowling, M. 2008. Reflexivity. In *The sage encyclopedia of qualitative research methods*,  
617 edited by L. M. Given. Los Angeles: Sage Publications, Inc.
- 618 Fawcett, B. 2008. Poststructuralism. In *The sage encyclopedia of qualitative research*  
619 *methods*, edited by L. M. Given. Los Angeles: Sage Publications, Inc.
- 620 Gabbard, C, and R. Krebs. 2012. Studying environmental influence on motor development in  
621 children. *The Physical Educator* 69:136-149.
- 622 Goldblatt, D. 2006. *The ball is round: A global history of football*. London: Penguin.
- 623 Guba, E.G. 1990. *The paradigm dialog*. Newbury Park: Sage Publications.
- 624 Hall, G. 2002. *Culture in bits: The monstrous future of theory*. London & New York:  
625 Continuum.
- 626 Ingham, A. G. . 1997. Toward a department of physical cultural studies and an end to tribal  
627 warfare. In *Critical postmodernism in human movement, physical education, and sport*,  
628 edited by J. Fernandez-Balboa. Albany: State University of New York Press.
- 629 Krebs, R. J. 2009. Bronfenbrenner's bioecological theory of human development and the  
630 process of development of sports talent. *International Journal of Sport Psychology* 40  
631 (1):108-135.
- 632 Larsson, H, and M. Quennerstedt. 2012. Understanding movement: A sociocultural approach  
633 to exploring moving humans. *Quest* 64 ( 4 ):283-298.
- 634 Lincoln, Y.S., and E.G. Guba. 1985. *Naturalistic inquiry*. Beverly Hills: Sage Publications.
- 635 Moen, P. 1995. Introduction. In *Examining lives in context: Perspectives on the ecology of*  
636 *human development*, edited by P. Moen, G. H. Elder and K. Luscher. Washington,  
637 DC: American Psychological Association.

- 638 Mullineaux, David R., Roger M. Bartlett, and Simon Bennett. 2001. Research design and  
639 statistics in biomechanics and motor control. *Journal of Sports Sciences* 19:739-760.
- 640 Pinder, R, K Davids, I Renshaw, and D Araújo. 2011. Representative learning design and  
641 functionality of research  
642 and practice in sport. *Journal of Sport & Exercise Psychology* 33 (1):146-155.
- 643 Renshaw, I, J-Y Chow, K Davids, and J Hammond. 2010. A constraints-led perspective to  
644 understanding skill acquisition and game play: A basis for integration of motor  
645 learning theory and physical education praxis? *Physical Education and Sport  
646 Pedagogy* 15 (2):117-137.
- 647 Ritzer, G. 1997. *Postmodern social theory*. New York: The McGraw-Hill Companies, Inc.
- 648 Salmon, J., and A. Timperio. 2007. Prevalence, trends and environmental influences on child  
649 and youth physical activity. . *Medicine in Sport Sciences* 50:183-199.
- 650 Saukko, P. 2005. Methodologies for culture studies: An integrative approach. In *The sage  
651 book of qualitative research*, edited by N. K. Denzin and Y. S. Lincoln. Thousand  
652 Oaks: Sage Publications.
- 653 Seifert, L, C Button, and K Davids. 2013. Key properties of expert movement systems in  
654 sport. *Sports Medicine* 43 (3):167-178.
- 655 Silverman, D. 2006 *Interpretative qualitative data*. 3 ed. London: Sage Publications.
- 656 Sparkes, A. C. 1992. *Research in physical education and sport: Exploring alternative visions*.  
657 London: Falmer Press.
- 658 Stattin, H., and D. Magnusson. 1990. *Paths through life: Pubertal maturation in female  
659 development*. Vol. 2. Hillsdale, NJ: Erlbaum.
- 660 Steinberg, L, N. E Darling, and A. C Fletcher. 1995. Authoritative parenting and adolescent  
661 adjustment: An ecological journey. In *Examining lives in context: Perspectives on the*

- 662 ecology of human development, edited by P. Moen, G. H. Elder and K. Luscher.  
663 Washington, DC: American Psychological Association.
- 664 Taylor, C. 1998. The beautiful game: A journey through latin america football. London:  
665 Phoenix.
- 666 Thomas, J. R., and J.K. Nelson. 2001. Research methods in physical education. 4th ed.  
667 Champaign, Illinois: Human Kinetics.
- 668 Willis, P. 2000. The ethnographic imagination. Malden, MA: Blackwell Publishers Inc.
- 669
- 670
- 671
- 672
- 673
- 674
- 675
- 676
- 677
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700 Figure 1. Illustration of Bronfenbrenner's bioecological model. N.B.: In relation to the  
 701 context, only microsystems are physically located. The others are "events or forces"  
 702 that influence the person and the particular microsystem under analysis. The  
 703 mesosystem encompasses other microsystems frequented by the person. The exosystem  
 704 comprises the microsystems that indirectly influence the person and the microsystem  
 705 under analysis. The macrosystem embraces the overarching patterns of the micro-,  
 706 meso, and exosystems contexts of a given culture. Further than the person and the  
 707 context, the bioecological model comprises time and process. Process expresses the  
 708 characteristics of person-context interactions over time. Additionally, person and  
 709 context change over time (Based on ideas of Araújo, et al., 2010).  
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724 Table 1. The philosophical, theoretical and methodological basis of contextualised skill  
 725 acquisition research. N.B.: for explanatory purposes it is necessary to describe constructs and  
 726 concepts as independent, however several concepts and ideas in the table are closely linked.  
 727 Rather than attempting to capture such complex and important relationships through a  
 728 simplified figure we recommend consulting the suggested sources of evidence and  
 729 background reading for further clarification.

730

<b>Construct</b>	<b>Concept</b>	<b>Suggested evidence &amp; background information</b>
Philosophical influences	Interpretive paradigm	Internal-idealist ontology: Denzin (1989); Sparkes (1992) Subjectivist epistemology: Andrews (2008)
	Holistic model of skill acquisition	Constraints-led approach, e.g., Davids, Button & Bennett (2008); Handford et al., (1997); Newell (1985)
Theoretical underpinnings	The athlete and environment conceptualised as a complex, dynamic system	Dynamical systems theory, e.g., Kelso (1995) Ecological psychology, e.g., Gibson (1979)
	Field-based study	Representative design, e.g., Brunswik (1955); Pinder et al., (2011)
	Sensitive to socio-cultural influences	Bioecological model of human development e.g., Bronfenbrenner (2006); Moen, Elder & Lüscher (2005)
Methodological tools	Bricolage	e.g., Denzin & Lincoln (2005); Creswell (2009)
	Ethnography, multi-method	e.g., contextual analysis, observation, field notes, interviews. For overviews, see: Patton (2002); Silverman (2006)
	Versatility and reflexivity	e.g., Dowling (2008); Fawcett (2008)
	Evaluation and coherence	e.g., Sparkes (1992; 1994)

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738 Table 2. Examples of inclusion criteria to be cross-referenced against information generated  
739 in interpretive research (Denzin 1989, 81).

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	<b>Inclusion criteria</b>
1.	Do they illuminate the phenomenon as lived experience?
2.	Are they based on thickly contextualised materials?
3.	Are they historically and relationally grounded?
4.	Are they processual and interactional?
5.	Do they engulf what is known about the phenomena?
6.	Do they incorporate prior understandings of the phenomena?
7.	Do they cohere and produce understanding?
8.	Are they unfinished or inconclusive?

746 **Rebuttal letter**

747 Once more we thank the Editor and reviewers for inviting us with the opportunity to revise  
 748 and resubmit our article. The questions raised by the reviewers prompted us to make the  
 749 following changes to the manuscript:

- 750 1) Inclusion of Figure legends and Table titles which were missing in the last  
 751 submission.
- 752 2) Clarification and additional references to support the rationale in the Introduction for  
 753 an interdisciplinary approach in PE and kinesiology.
- 754 3) More detail and references in the section on Bronfenbrenner's bioecological model to  
 755 elucidate the important role of this framework.
- 756 4) Clarification of the nonlinear/non-sequential processes suggested in the methods as  
 757 well as an example open-ended question.
- 758 5) Discussion of ways to link the broader (macro) context with individual skill  
 759 experiences.

760 The changes to the manuscript are clearly marked in highlighted text. A more detailed point-  
 761 by-point response to each reviewer also follows this letter. We should point out that due to  
 762 space limitations imposed by the journal we have been unable to act upon all of the  
 763 reviewers' suggestions but hope that the changes we have made sufficiently address the  
 764 concerns raised.

765 **Reviewer: 1**766 **1) More comprehensive explanation of Figure 1**

767 **The authors have tried to explain Figure 1 in the main body of the manuscript. However, I**  
 768 **was hoping that more detailed reference to what Figure 1 really means can be provided.**

769 It appears that the legends for Figure 1 and Tables 1/2 were not included in the original  
 770 submission. We apologise if this was our oversight (and not an upload error), the  
 771 explanations of the Tables and Figure are now included in the latest revision.

772 **2) Additional reference to support statement**

773 **Can the authors provide more references to support the statement made in line 51?**

774 Thank you for drawing our attention to these useful references and our slight  
 775 misinterpretation of Physical Cultural Studies. We have made subtle changes to the text to  
 776 reflect the different positions of the works that Reviewer 2 recommended to us. This new  
 777 information is highlighted on pg. 3:

778 "We are not the first to propose a potential solution for these limitations of kinesiology and  
 779 physical education (e.g., Ingham, 1997; Andrews, 2008). Andrews et al. (2013) paint an  
 780 explicitly socially critical vision for kinesiology – under the aegis of Physical Cultural  
 781 Studies as: "an interdisciplinary field ground within a critical curriculum of the corporeal that  
 782 draws on a range of exciting and innovative methodologies that can provide the languages of,

783 and possibilities for, a politically progressive, socially just, and democratic citizenry.”  
 784 Although not grounded in critical paradigms and political projects in precisely the same way,  
 785 we too envisage future possibilities in which biophysical sciences and socio-cultural sciences  
 786 may be inextricably linked. We acknowledge that our tentative contribution to the  
 787 development of this new paradigm is to build bridges across the methodological boundaries  
 788 between sociology and motor learning in the first instance, rather than offering a unifying  
 789 approach for the whole field.”

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791 **3) Further clarification on nonlinear and non-sequential research process**

792 **How would the authors define these nonlinear and non-sequential processes? Do you**  
 793 **follow any pre-set parameters to determine how to do these?**

794 These ‘reflexive’ processes in which qualitative researchers may need to switch between  
 795 different aspects of the research process are described comprehensively by Dowling (2008).  
 796 There are no pre-set parameters to determine how to research with reflexivity, indeed by  
 797 definition one must respond to key issues as they emerge. One might argue that one  
 798 parameter that is adopted within our approach of ‘*point of saturation*’ is pre-set, however one  
 799 cannot determine that point in advance instead one must carefully interpret the findings  
 800 ongoingly to identify it.

801 **4) ‘*eho*’**

802 **What does this mean? Line 376**

803 It should have read ‘who’ - this has been corrected.

804 **5) Provide some sample questions**

805 **Could the authors provide some examples of such open-ended questions? Line 382.**

806 A sample open-ended question is now provided in this section.

807 **6) Leverage on past studies of similar nature**

808 **Can the authors provide more examples (past studies) that have used very similar design to**  
 809 **what you intend to do? Are there any specific detailed study to provide as an example? This**  
 810 **will give the reader a better idea of what has been previously done that you are proposing**  
 811 **in your work.**

812 As we point out in the article relatively few studies to date have adopted the interdisciplinary  
 813 philosophy and range of methods that we propose. That said we have added references from  
 814 the motor development literature that utilise Bronfenbrenner’s model and certain aspects of  
 815 the ethnographical approach that we advocate (e.g.....). Araújo et al.’s (2010) study is  
 816 probably the most pertinent example that we can offer and whilst not without its limitations,  
 817 we have discussed their work at length (pg.13-14).

818 **Reviewer: 2**

819 **1. The major issue centers on the lack of engagement with the various dimensions of**  
820 **Bronfenbrenner's ecological systems model. I was fully expected the macros/meso/micro**  
821 **systems to be discussed within the differing scalar contexts of Brazilian soccer culture, but**  
822 **this was rather overlooked. Some systems were alluded to, however, not in sufficient depth**  
823 **or detail. I think a paragraph on each would greatly embellished the contextualized nature**  
824 **of the approach, and of this example.**

825 Additional details in the main text and to Figure 1 have been provided. It was not the aim of  
826 this article to provide a comprehensive overview of Bronfenbrenner's bioecological model  
827 (suitable references are provided in that regard). Instead our intentions were to overview the  
828 main concepts within the model and then allude to how it may provide a supporting  
829 framework when analysing information from a contextualised skill acquisition approach. The  
830 word limit of the journal meant that we could not add more detail regarding the different  
831 scalar contexts of Brazilian soccer culture but that will certainly be a primary objective in  
832 forthcoming publications.

833 **2. I was wholly lost and confused by the tables/figures, and was never quite sure to which**  
834 **the text was referring.**

835 This was an oversight on our behalf. The legends for the Figure and Tables were not included  
836 in the original submission and this has now been addressed in the latest revision. We have  
837 also rechecked the manuscript to ensure that the references to tables and the figure are clear  
838 and accurate.

839 **3. The reference to Physical Cultural Studies is slightly awry. Ingham (1997) certainly**  
840 **advocated a "whole field" approach, whereas Andrews (2008), and for that matter Silk and**  
841 **Andrews (2011) and Andrews et al (2013) were less ambitious in their inter-disciplinary**  
842 **vision.**

843 Thank you for drawing our attention to these useful references and our slight  
844 misinterpretation of Physical Cultural Studies. We have made subtle changes to the text to  
845 reflect the different positions of the works that Reviewer 2 recommended to us. This new  
846 information is highlighted on pg. 3:

847 “We are not the first to propose a potential solution for these limitations of kinesiology and  
848 physical education (e.g., Ingham, 1997; Andrews, 2008). The words of Andrews et al. (2013)  
849 paint a utopian vision for kinesiology as: “an interdisciplinary field ground within a critical  
850 curriculum of the corporeal that draws on a range of exciting and innovative methodologies  
851 that can provide the languages of, and possibilities for, a politically progressive, socially just,  
852 and democratic citizenry.” Indeed, we too envisage a future in which biophysical sciences  
853 and socio-cultural sciences are inextricably linked. We acknowledge that our tentative  
854 contribution to the development of this new paradigm is to build bridges across the sub-  
855 disciplines of sociology and motor learning in the first instance, rather than offering a  
856 unifying approach for the whole field.”

857 **4. There could have been a little more detail regarding the outlining of precisely what new**  
 858 **forms understanding this contextualized approach to skill acquisition elicited. This is**  
 859 **alluded to in numerous places, I simply felt the rationale for the project would be stronger**  
 860 **if these were made more explicit.**

861 Some of the new forms of understanding that the contextualised approach to skill acquisition  
 862 can elicit are now explicitly discussed in the Introduction and final section of the article. For  
 863 example, the following text has been added to the conclusion section (pg 23):

864 “In particular the approach provides researchers with the tools/rationale to link different  
 865 systems within which an individual develops. As such an enriched understanding of the  
 866 individual’s lived experiences within the broader social, geographical, historical (etc.) context  
 867 can be reached.”

868 **5. Personally (and I am certainly not expecting the authors to change this, its just an**  
 869 **observation I feel I needed to make), I much prefer the notion of context to constraints, as**  
 870 **the latter seems to deny the possibility of enabling factors? This, of course, could be**  
 871 **because I am not familiar with skill acquisition research or rhetoric, I just felt context was**  
 872 **a more open category?**

873 Thank you for your suggestion. This is a common misconception of the constraints concept  
 874 (i.e., that they serve only to restrict movements whereas in fact they too enable movement to  
 875 occur). As the constraints-led approach is such an important theoretical and philosophical  
 876 influence on our work we have chosen to stick with this concept with the inclusion of  
 877 additional clarification to the enabling nature of constraints (highlighted footnote pg. 2):

878 “Constraints are the range of factors that can both limit, and facilitate, the organisation of  
 879 human movement coordination. Constraints can be broadly categorised into three types,  
 880 namely; Task, Environmental, and Organismic. The constraints-led approach forms a  
 881 multidisciplinary and holistic foundation upon which an understanding of motor behaviour  
 882 can be constructed (Davids, Button, & Bennett, 2008).”

883 **6. In their description of Bronfenbrenner's ecological systems model, the authors have**  
 884 **categorized the macro system (pp. 11-12) in a manner which privileges the immediate**  
 885 **sporting context, overlooks the social, political, economic, and technological contexts with**  
 886 **which sport is dialectically related. Later in the discussion, these contextual dimensions**  
 887 **are referred to in the Brazilian context (though in a rather vague and ambiguous way), but**  
 888 **here they are not mentioned.**

889 Thank you for drawing our attention to this important point, it was not our intention to  
 890 privilege any one context over any others. Additional details in the main text and to Figure 1  
 891 have been provided as suggested (e.g., p. 12 & 14). Due to space limitations it was not  
 892 possible to provide further detail with regard how these contextual dimensions are manifest in  
 893 the Brazilian context. We have another manuscript in preparation that will achieve this  
 894 purpose.

895 **7. Another key relationship that is presently under-developed is that between the broader**  
896 **(macro-context) and lived/embodied/skill experience. How do we connect these different,**  
897 **yet clearly interrelated dimensions? The authors did not really provide an framework for**  
898 **linking them. Yes, they identified the necessary linkages, but is there a more nuanced way**  
899 **of thinking through the specifics of these relations? How do we connect these two, quite**  
900 **different, forms of data?**

901 This is a useful observation and we have attempted to provide suggestions about how to link  
902 disparate forms of data in the revised submission. For example by adding an example of one  
903 open-ended question (Reviewer 1's request) we also used the opportunity to elaborate in  
904 more detail how a broad macro-level context can influence and be linked to an individual's  
905 lived experiences and beliefs (pg. 19).

906 "As an example, when the topic of socio-cultural such as dance, poverty (etc.) was brought  
907 into the discussion, I then asked: "Tell me about how you perceive the relationship between  
908 dance and Brazilian football?" Depending on the response received, I could be more specific  
909 and probe further: "Tell me about how you perceive the effect of samba on the development  
910 of skills of Brazilian football players?" As such the broad macro-level dimension of samba as  
911 a socio-cultural constraint in Brazil can be explicitly linked with each individual's lived skill  
912 experiences. Bear in mind that, as explained above, such topics and lines of questioning were  
913 informed by the historical-context analysis performed prior to the field work in Brazil."

914 **8. A few of the references (i.e. Saukko, 2005; Hall, 2006) could not be found in the**  
915 **reference list.**

916 Apologies for this oversight, the missing references have now been added.

917