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A qualitative synthesis of research into social motivational influences across the athletic career span

R.J. Keegan^{a*}, C.M. Spray^b, C.G. Harwood^b and D.E. Lavallee^c

^aNational Institute of Sport Studies, Faculty of Health, University of Canberra, Bruce, Australian Capital Territory, Canberra, Australia; ^bSchool of Sport, Exercise and Health Sciences, Loughborough University, Loughborough, UK; ^cSchool of Sport, University of Stirling, Stirling, UK

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This study represents a qualitative synthesis of research examining the socio-environmental influences of coaches, parents and peers on athlete motivation, across the athletic career-span. Using a critical-realist perspective, meta-interpretation methodology was deployed to search and analyse the literature. On-going, iterative analysis generated new areas of enquiry and new search terms, until the emerging analysis reached the points of saturation. Inclusion and exclusion criteria were developed during this process to produce a clear statement of applicability for the study. In the final analysis, a developmental structure was specified to describe the athletic career trajectory, together with a horizontal structure capturing seven domains of the motivational atmosphere surrounding athletes (competition, training, evaluation, emotion, authority, social-support, and relatedness), and a vertical structure varying in terms of level-of-abstraction: The global/broad 'motivational atmosphere' containing contextual 'climates', built from immediate/situational 'motivational conditions'. A model of the overall 'motivational atmosphere' in sport, based on a meteorological analogy, is offered with a view to stimulating critical debate and new research directions that reflect the complexity of interpersonal motivation in sport.

Keywords: motivation; climate; coaching; parent influences; peer influences

Motivation is an important and recurring theme in sport psychology: any behaviour exhibited (or not) is a result of motivational processes (Deci and Ryan 1985). Motivation is often confused with ideas concerning energisation or arousal, but it is better understood as a function of the goals, or reasons, behind the motivated activity (Roberts 2001). Hence, when studying the social influences on the motivation of athletes, one is examining the reasons behind the motivated actions and the ways in which coaches, parents and peers, for example, can influence these reasons. These three social agents, taken together, are perhaps the most consistent and reliable sources of influence across the athlete's sporting experience. A number of qualitative studies have recently examined these influences (e.g. Vazou *et al.* 2005, Beltman and Volet 2007, Keegan *et al.* 2009, 2010a, 2010b), and this study is an attempt to

*Corresponding author. Email: richard.keegan@canberra.edu.au

This article was originally published with an error. This version has been corrected.

reach a synthesis of these papers such that key themes and trends may be identified and drawn out.

In recent years, qualitative studies (e.g. Vazou *et al.* 2005, Garcia Bengoechea and Streaun 2007, McCarthy and Jones 2007, Keegan *et al.* 2009, 2010b) have suggested a complex interactivity between motivationally relevant behaviours and their impact on athletes' motivation. The influence of all motivationally relevant behaviours from key social agents were argued to be moderated by other factors such as: (1) the behaviours immediately preceding the event; (2) co-occurring behaviours – that is, 'it's not what you said, it's the way (or moment, or place) you said it'; (3) the consistency of the behaviour in relation to the person concerned and in comparison to others; (4) the relationship between the athlete and protagonist; and (5) other contextual or environmental variables (e.g. training vs. competition setting, stage-of-season – cf. Keegan *et al.* 2009). Other studies have also concluded by calling for a fine grained deconstruction of the motivational climate construct (Elliot 1999, Morgan *et al.* 2005, Smith *et al.* 2007). The studies by Keegan *et al.* proposed that the roles assigned to each social agent, and the manner in which they were performed, seemed to be the most pertinent way of analysing social motivational influences in sport. Where roles were similar, social agents were reported to influence motivation through very similar means (e.g. coach leadership, parent leadership). Where roles differed or diverged, the means-of-influencing athlete motivation became notably different (e.g. coaching centred around instruction, parenting centred around logistical and emotional support). Hence, research suggests that a deeper understanding of the roles played by people surrounding the athlete *and* the ways in which these roles are performed/fulfilled will lead to a vastly improved understanding of social influences on athlete motivation.

Theoretical and philosophical context

One term that has dominated research in this area is *motivational climate* – defined as the perceived structure of the achievement setting established by specific pragmatic situational and contextual cues (Ames 1992). This term originated within achievement goal theory (AGT – Nicholls 1989), wherein sport participants' immediate goals were hypothesised to be determined by the interaction of their *goal orientation* (a tendency or proneness in individuals towards adopting certain achievement goals), with the situational *goal climate* – key indices of the social environment such as how groups are selected or the nature of evaluation (normative vs. individual) that should influence the perception of motivational climate by the athlete. The traditional dichotomous AGT framework defined these goals, at all three levels (involvement, orientation and climate), in one of two ways: performance/ego goals emphasised normative evaluations of competence and outperforming others, whereas mastery/task goals emphasised effort, personal improvement and task mastery (Nicholls 1989). As such, perceptions of climate combine with pre-existing dispositions towards each goal in determining the momentary goal-involvement that the individual experiences. Extensive research, frequently using questionnaires, suggested that perceptions of a task/mastery climate (usually 'coach-instigated') correlated with many motivationally adaptive outcomes, whereas perceptions of an ego/performance climate either showed no such relationships, or correlated with negative outcomes, such as anxiety and tension (for reviews see Ntoumanis and Biddle 1999, Harwood *et al.* 2008). However,

theorists' classification of the complex social milieu that influences an athlete's motivation into only two broad categories has been criticised as an over-simplification – that is, too parsimonious (e.g. Keegan *et al.* 2010a).

Importantly, this proposed departure from parsimonious approaches – for example: bi-partite for Nicholls' (1989) achievement goals; tri-partite for Elliot's (1999) achievement goals and also Deci and Ryan's (1985) basic needs theory (from self-determination theory – SDT); and quad-partite for Elliot and McGregor's (2001) two-by-two framework – also required the adoption of what is termed a 'theoretically agnostic' approach (Sandelowski 1993, Henwood and Pidgeon 2003). This would involve declining to adopt a single guiding explanatory framework a priori and instead engaging with the data in the full knowledge of existing theories (i.e. not naïve) but critically and effortfully seeking to avoid allowing one theory to steer data collection or interpretation. This approach is argued to be necessary, at least to complement and extend existing research, because relying on parsimonious approaches may force researchers to: (1) examine *specific questions* (e.g. exclusively derived from the guiding theory); (2) using *specific methods* (usually questionnaires, also derived from the guiding theory, and/or using mathematical modelling that seeks parsimony and rejects interaction/'cross-loadings'); (3) be constrained by *specific analytic techniques* (usually correlational, and therefore never addressing causality – Aldrich 1995); and (4) to ultimately deliver very *similar answers* (perceptions of x correlate with perceptions of y , making the most likely source of consistency/correlation the perceiver, not the environment – cf. Keegan *et al.* 2010a). In effect, theoretical agnosticism involves abandoning the study of a particular theory (which often involves believing/adopting it beforehand, a priori – that is, 'I am a _____ theorist' – cf. Kuhn 1962) and instead studying the objective and complex reality – appropriately informed by existing theory but also informing the development of new theories.

In this approach, which embodies the philosophy-of-science termed *critical realism* (cf. Bhaskar 1975, 1989), theories are to be constantly updated, tested-to-failure and then replaced, rather than being staunchly defended and maintained as 'true' (e.g. Treasure *et al.* 2001). In critical realism, a theory is never considered true or proven, but rather awaiting falsification and/or improvement (see also Popper 1969). Hence, in order to achieve the desired fine-grained detail, and to better represent the complex interactivity of the ways social influences determine athlete motivation, a theoretically agnostic and critical realist approach was adopted to this research. At the very least, asking different questions and using different methods will provide ostensibly different answers, and this represents an advancement of current understanding.

Qualitative research synthesis

Research synthesis is an area of fervent debate within the sport sciences (Biddle 2006), but this tension is at its most pronounced in the synthesis of qualitative papers (Weed 2006, 2008). Sandelowski (2006) proposed that meta-synthesis, 'the science of summing up' (cf. Light and Pillemer 1984), can be either quantitative or qualitative, but criticised a situation of institutionalised quantitativism, leading to the process being almost entirely determined by quantitative methods (see also, Hagger and Chatzisarantis 2011). With a number of interesting qualitative studies examining social and environmental influences on motivation, establishing a suitable method of qualitative research synthesis was a necessary foundational step.

Weed (2006, 2008) proposed a meta-interpretation (MI) methodology as a way of extracting the findings of multiple qualitative studies from different research studies/teams, and then continuing the analysis. This approach is analogous to Grounded Theory's (GT – Glaser and Strauss 1967, Strauss and Corbin 1990) *formal theory* stage (following the *substantive theory* development). GT concepts of theoretical sampling, saturation, constant comparison and transparency permeate the process, with an added emphasis on active interpretation as opposed to 'passive' emergence (Glaser 1992). The interested reader is recommended to read Weed (2006, 2008) for a full explanation of the procedure, which is also detailed in Figure 1. The MI methodology has been successfully implemented in a recent study by Arnold and Fletcher (2012), although a tighter conceptual focus allowed for many fewer iterations of the analysis process (see Method).

Study aims

As a result of the issues described in this introduction, this meta-interpretive study set out to address the following aims: (1) creating a synthesis of findings regarding the behaviours, values and interactions that constitute the socio-environmental influences on motivation; (2) building an understanding of how these influences change and transform across the athletic career trajectory; and (3) building towards a coherent approach to the study of socio-environmental influences on motivation in sport.

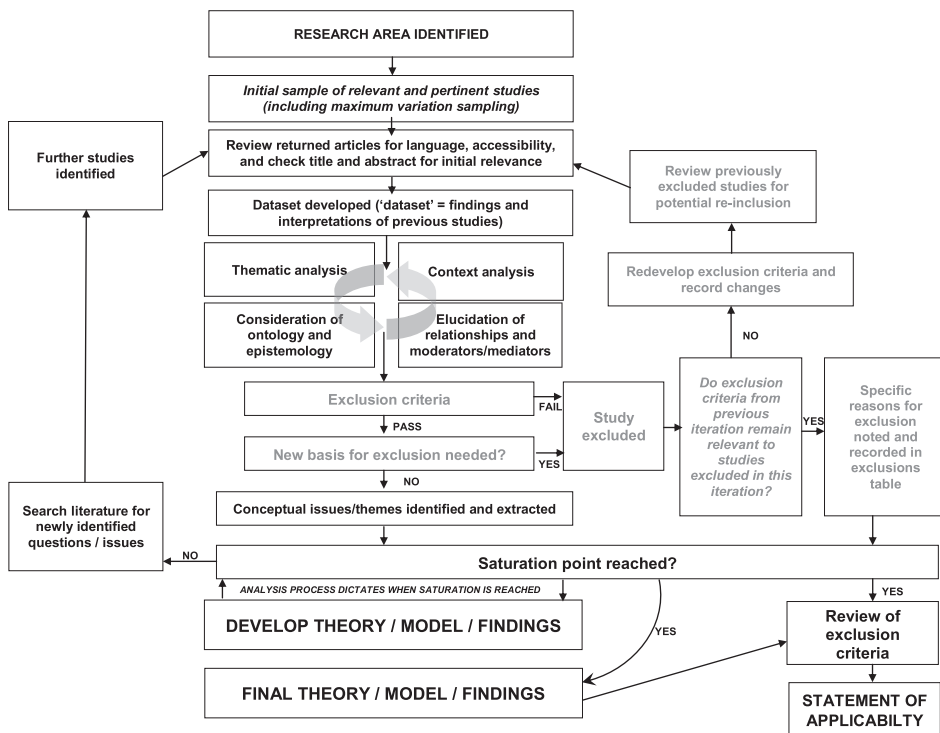


Figure 1. A diagram describing the MI methodology deployed in this study, adapted from Weed (2006).

Method

Sources

The search strategy was an iterative process, determined in relation to the on-going analysis. This procedure simultaneously raised new areas for theoretical sampling, as well as stimulating adaptations of the inclusion/exclusion criteria. Each time the (re)engagement of literature was required, searches used the following three sources to locate studies: (1) electronic searches of computerised databases, including Web of Science, SPORTDiscus and ScienceDirect (search terms were recorded in the audit trail); (2) the authors' own knowledge of published research articles, reviews and chapters in the area (i.e. recalling recent searches and reviews of papers); and (3) citations in papers identified by the electronic searches. The particular search strategy used depended on the state of the analysis and the ideas/themes being developed. Keyword combinations used included *motivat**, *climat**, *sport*, *career*, *transition*, *athlete*, *coach**, *parent** (stars in these search terms allow any combination of letters thereafter). One inclusion criterion that was specified before the study was undertaken was that articles must have been published in the English language. Literature searching was finalised in July 2013, meaning papers published after this date are excluded from the findings of this paper.

Procedure

The MI methodology outlined by Weed (2006) was adapted for this study (see Figure 1). Electronic and hard copies of publications were obtained and assessed for: relevance/pertinence (in relation to the current stage of the analysis); methodological transparency; ontological/epistemological position; analytic procedure; and availability of findings. Where findings were accessible, relevant (i.e. theoretical sampling), and transparent, then studies were retained and their findings contributed themes to the analysis. Studies could contribute raw themes (e.g. findings), structure (e.g. the career progression and transitions within it), and guidance in proposing relationships/associations. As the analysis progressed, studies were included that elucidated key relationships or indicated the similarity and compatibility of concepts (e.g. 'social support' and 'relationships' emerged to be quite similar ideas but contained different themes. On-going engagement with the literature and studies supported this distinction, as well providing sufficient justification to locate them close to each other in the model).

During the course of the analysis, 80 iterations of the MI procedure (illustrated in Figure 1) were recorded, each time conducting several literature searches and repeating/refining them until no new papers emerged. Chronologically, the initial stages of the analysis involved generating a list of known papers pertaining to athletic career development and social motivational influences. Thereafter, one iteration was devoted to identifying and coding career stages (the 'developmental structure'), resulting in three clear career stages. Subsequently, six iterations involved generating a range of broad search terms/areas, resulting in seven distinguishable areas of social influence on motivation (the 'horizontal structure' – see below). Subsequently, repeated searches were conducted for all three social agents, at all three career stages, across all seven identified areas, accounting for 63 iterations of the MI process. Changes to search terms and inclusion/exclusion criteria accounted for the remaining ten iterations. This exhaustive and iterative approach

rendered the recording of the exact number of papers rejected at each stage (or in total) impractical, due to extensive replication in the repeated searches.

Data analysis

The process of data analysis started immediately once the first cohort of studies had been selected. On-going reflections, for example regarding abductive/retroductive inferences, and critical discussions took place between the analyst and co-authors, arriving at new ideas and themes to explore. The aim of this theoretical sampling, in combination with on-going analysis, was to ‘refine ideas, not increase the size of the original sample’ (Charmaz 2000, p. 159). The following procedures were implemented to maximise transparency and trustworthiness: (1) a clear *audit trail* was created and maintained so that colleagues and peers could question analytic decisions and ‘follow the workings’; (2) athlete *critical friends* were recruited and interviewed in focus groups ($n = 3$) in order to create a dialogue about the fairness, appropriateness and believability of interpretations offered (cf. Tracy 2010, Smith and Caddick 2012). Following the initial presentation of themes, participants’ responses were recorded with a view to informing both the continuing sampling of literature and the critical reflections and peer debriefing processes. The different perspectives offered by these critical friends were used as a resource for challenging and developing the interpretations made by the analyst, to assist in constructing a coherent and defensible analysis (cf. Smith and Deemer 2000), and not as a validity or reliability ‘check’; (3) an iterative *consensus validation* procedure was undertaken with two members of the research team to ensure the integration of themes and ideas made the most analytic sense; and (4) a *critical peer debrief* was conducted in review of the final analysis. Within the analysis, the interpretations and findings of previous research papers were treated as the raw data, and processes of constant comparison, open and focused coding, memo-writing/diagram drawing, critical reflection (alone or in discussions), and theoretical (re)sampling, as well as the constant maintaining and updating of inclusion criteria were all deployed during the analysis.

Included and excluded studies

Search results were initially judged on their content by assessing the abstract, resulting in the immediate exclusion of many papers (sometimes repeatedly), before the paper was sampled and analysed (i.e. not recorded). In total, 134 papers were isolated as being relevant during the analysis. After applying the inclusion criteria, 45 papers were able to contribute meaningfully to the final analysis. Many studies were identified repeatedly, in separate searches, and the applicability was always assessed anew depending on the operative inclusion criteria. However, their status at the end of the analysis can be summarised as follows: (1) *Language* – article must be published in the English language; (2) *Peer reviewed* – papers must have been published in journals using a clear peer review process. This led to the exclusion of ‘grey’ literature, but only after extensive engagement with unpublished papers led to the conclusion that the difficulty accessing these papers, along with the lack of robust peer review, outweighed any potential advantages of including them; (3) *Inductive emphasis* – articles must contain an inductive component (e.g. inductive qualitative analysis, exploratory factor analysis). Written alternatively, papers that

analysed data in a highly deductive fashion (in relation to one ‘preferred’ theory at the exclusion of other explanations) were excluded. Seven iterations were undertaken in the early stages of the analysis wherein this rule was not yet in effect, at a stage when the analyst was attempting to define and clarify the ‘horizontal structure’ – the arrangement of sub-climates within the broader atmosphere; (4) *Transparency* – articles must present sufficient and transparent explanations of analytic procedures. The term transparency was also applied to results (which formed the raw data for the current study), such that if a concept/theme was considered either too abstract or nebulous, or to be inconsistently/unclearly coded, then this would result in the exclusion of the theme or (if persistent) the study. This process is argued by Weed (2006) to be comparable with the way in which segments of interview/focus group content are sometimes overlooked if the analyst cannot find a place for them in the analysis; (5) *Relevance* – each paper had to return one-or-more themes relevant to the immediate question being asked by the present analysis (e.g. ‘What concepts/themes might be relevant when considering the influence of [coach/athlete/peers] in the context of [competition/training/evaluation/social-support, etc.] for [sampling/specialising/mastery] athletes?’). The iterative searching and analysis ensured the maximum likelihood of relevant papers being uncovered; (6) *Sport specific* – papers examining social motivation in exercise, academic settings, PE and the workplace were marked for exclusion; (7) *Motivation specific* – papers and themes had to explicitly pertain to motivation and social motivational processes. A number of papers relating to anxiety, stress, confidence and other associated themes were excluded; (8) *Social and environmental influences only* – studies examining intrapersonal variables were excluded and, as a result, a rule was quickly introduced to overlook any studies/findings that focused on intra-individual constructs such as trait goal-orientations or perceived competence; and (9) *Avoid redundancy* – a rule was introduced during the content analysis stage to prevent the replication of themes within career-stages. Repetition of themes across the horizontal structure was deemed undesirable as it risked blurring boundaries between sub-climates and falsely ‘padding out’ the findings. Given that the paper is explicitly an MI, the co-authors (in their respective roles) recommended that the analyst should make an analytic judgement rather than ‘leaving it open’. A table of extracts from the audit trail, detailing key decisions around each exclusion/inclusion criteria, is shown in Table 1. Likewise, a summary of the studies that were included, and where they contributed content, can be viewed in Table 2 (NB: a table, showing studies that were considered but excluded, with reasons, is available on request from the first author).

Statement of applicability

A review of the above exclusion/inclusion criteria leads to the following statement of applicability:

This study and its findings relate to the motivationally-relevant interpersonal processes occurring between athletes and their coach(es), parents, and peers in the sporting context. It is based upon research written in English in peer reviewed scientific publications. Every effort has been made to manage/reduce the impact of pre-existing theories in influencing the analysis (i.e. theoretical agnosticism). This study presents a taxonomy (Figure 2) and a model (Figure 3) of motivational processes that are intended to stimulate thinking in the area and contribute ideas. These proposals are not intended to present an explanatory/predictive theory in their current state. Intrapersonal variables are not included in this analysis.

Table 1. Samples of the audit trail generated during the development of the inclusion/exclusion criteria.

Number (order of development)	Inclusion criterion	Audit trail notes (made during development)
1	Language	Unable to read or speak other languages, translation software not up to scratch. Plus searching in English-language and English-databases. Majority of work in this area does appear to be in English-language journals so impact, whilst unknowable, should be tolerable
2	Peer reviewed	Experimented with grey literature (opengrey and Google Scholar) but found relatively few results, and findings were often of little help. 'Quality assurance' of using peer reviewed journals seems to far outweigh any detectable benefits of using grey literature
3	Inductive emphasis	First exclusion criteria is to avoid speculating about the correctness (or otherwise) about the competing theories of motivation. Qualitative studies where analysis has been explicitly or implicitly (i.e. strong suspicion) informed by theoretical guidelines must be excluded or else we will simply 'rediscover' existing theories ... [later] Studies using questionnaire designs must be explicitly and transparently inductive (e.g. EFA/CFA), not informed by existing theories. Correlations must be only be used to inform the ordering of the horizontal structure, nothing more
4	Transparency	Impenetrable ontological or epistemological assumptions – this undermines any attempt to contextualise the study or properly understand the findings. NB: undeclared ontology/epistemology is fine, as long as it is easily inferred – on the grounds of the sheer prevalence of this reporting behaviour (otherwise there wouldn't be any studies to include)
5	Relevance	Upon inspecting the themes in the article, if it is clear that none of them are of relevance to the immediate question being asked (e.g. career stage, horizontal structure, specific motivationally-relevant behaviours) then the study should be excluded. Future iterations will pick it up again if the questions change/evolve
6	Sport specific	Exclude articles referring to exercise motivation ... Be very careful with articles addressing PE. Unless there are exceptional reasons, these should also be excluded. <<Update – exclude PE as well: different aims/context. Definitely exclude non-PE academic pursuits. <<Update – exclude recreational samples, i.e. ones that are not reconcilable with initiation or specialisation career stages
7	Motivation specific	Papers on anxiety and confidence etc. keep coming up. Need to try and focus on to motivation – many

(Continued)

Table 1. (Continued).

Number (order of development)	Inclusion criterion	Audit trail notes (made during development)
8	Social and environmental influences	of these studies are loosely related or contain the word in their text/abstract but do not actually focus on motivation – must make informed appraisal in each instance Need to avoid studies that ultimately focus on intrapersonal variables, as these are not the focus on this analysis. Likewise need to avoid studies that only assess the individuals' general perceptions (impressions) of their motivational climate, not the actual observable behaviours
9	Avoid redundancy	Try to avoid replication of themes within each career phase (init, spec, invest) – if repeat themes are coming up then this may be a sign of saturation being reached. Equally try to avoid dissolving key ideas by abstracting too quickly – if there is a suspicion of differences in meaning then it should be allowed to persist and be tested

Results and discussion

Developmental structure

The construction of a developmental structure was undertaken in order to assess and establish the divisions between career stages. The papers that contributed to this structure included: Côté (1999, 2002); Côté and Hay (2002a, 2002b); Côté *et al.* (2003, 2007); Wylleman *et al.* (2004); Bruner *et al.* (2008); Pummell *et al.* (2008); and Strachan *et al.* (2009). The main aim of this stage was to construct a simple conceptual framework of the athletic career and establish the characteristics of each career-stage.

There were notable conceptual similarities between the approaches used, allowing the analysis to quickly identify three clear career stages, which contained far more conceptual similarities than differences (summarised in Table 3). Across all papers sampled, the early career is characterised by participants who are generally prompted to try a number of different sports and see if they either enjoy it or have some talent: termed 'initiation' (Côté *et al.* 2003) or 'sampling' (Wylleman *et al.* 2004). Following this stage, 'specialising' occurs in which athletes tend to focus on one or two sports to specialise in: seeking to learn the key skills, tactics and rules. For those athletes who continue into the investment-mastery stage, their 'arrival' is likely to be signified by the completion of several transitional processes, including: from informal to specialist coaching, from significant reliance on parents to an informal supporting role, and from play (free or of deliberate) to deliberate practice (Côté *et al.* 2003). The final stage, investment-mastery, is represented by persistent, focused and deliberate practice/training, and involves a period of either trying to reach elite level, or maintain the highest possible level of performance (Côté *et al.* 2003). This third career stage can begin from 15 years of age in some sports, although 18–19 years of age is proposed to be the average (Wylleman *et al.* 2004 – see Table 3).

The completion of this task allowed for new studies/themes entering the analysis to be classified according to which career-stage(s) they examined. Hence, three

Table 2. Table of studies included in the MI, detailing type of study, career-stage, and how contributed (e.g. themes, relationships, social agent). Key: CC = competition climate; TC = training climate; EV = evaluation climate; EM = emotional climate; AU = authority climate; SS = social support climate; and RE = relatedness climate.

Paper	Sample	Career stage	Contribution to organising structures	Social agents	Climate(s) contributed to:	Additional contributions
Adie <i>et al.</i> (2008)	539 athletes	N/A	Developmental		EM AU	Correlational link
Allen (2003)	100 adolescent females	Spec.		Pe.		SS RE
Amorose and Horn (2000)	386 college athletes	N/A	Developmental		TC EV	Experimental link
Amorose and Weiss (1998)	60 young athletes on a summer camp	Init. + Spec.	Developmental		TC EV	Experimental link
Babkes and Weiss (1999)	227 young athletes and 283 parents	Init. + Spec.		Pa.	CC TC EM	
Beltman and Volet (2007) ('sustained motivation')	30 Australian athletes + musicians	Spec.		Pa Pe.	EV	SS
Bruner <i>et al.</i> (2008)	8 ice-hockey players transitioning	Spec. + Invest.	Horizontal	C Pe	TC EV	SS RE
Conroy and Coatsworth (2007a)	165 young athletes	Init. + Spec.		C	TC EV EM AU	
Conroy and Coatsworth (2007b)	165 young athletes	Init. + Spec.		C	AU	RE
Côté (1999)	4 families of elite athletes	Init. Spec + Invest.	Horizontal	Pa	CC TC	SS
Côté (2002)	Review chapter	Init. + Spec	Horizontal	C Pe	CC TC	RE
Côté and Hay (2002a)	Review chapter	Init. Spec + Invest.	Horizontal	C Pa Pe	CC TC	
Côté and Hay (2002b)	Review chapter	Init. + Spec	Horizontal	Pa		SS
Côté <i>et al.</i> (2003)	Review chapter	Init. Spec + Invest.	Horizontal	C Pa Pe	CC TC	

(Continued)

Table 2. (Continued).

Paper	Sample	Career stage	Contribution to organising structures	Social agents	Climate(s) contributed to:	Additional contributions
Côté <i>et al.</i> (2007)	Review chapter	Init. Invest.	Horizontal	C Pa Pe	CC TC	
Farrell <i>et al.</i> (2004)	38 Special Olympians	Invest		C Pe	SS	RE
Fraser-Thomas and Côté (2009)	22 adolescent swimmers	Spec.		C Pa Pe	TC EV AU	SS
Garcia Bengoechea and Streat (2007)	12 adolescent athletes	Spec.		C Pa Pe	TC AU	SS
Gearity and Murray (2011)	16 athletes and former athletes	Spec		C	TC EV EM AU	
Gould <i>et al.</i> (2008)	24 coaches of junior tennis players	Spec.		Pa.	CC TC EV EM AU	SS
Hollebeak and Amorose (2005)	280 collegiate athletes	N/A	Developmental	N/A		Overall arrangement
Holt <i>et al.</i> (2008)	4 families of youth athletes	Spec.	Developmental		AU	SS
Holt <i>et al.</i> (2009)	56 parents + 34 female children	Spec.	Developmental	Pa	TC EV EM AU	
Jackson <i>et al.</i> (2008)	6 pairs of elite athletes	Invest.	Developmental	Pe	EV	RE
Keegan <i>et al.</i> (2009)	40 'initiator' athletes	Init.	Horizontal + Developmental	C Pa Pe	CC TC EV EM AU	SS RE
Keegan <i>et al.</i> (2010a)	28 'investment-mastery' athletes	Invest.	Horizontal + Developmental	C Pa Pe	CC TC EV EM AU	SS RE
Keegan <i>et al.</i> (2010b)	79 'specializing' athletes	Spec.	Horizontal + Developmental	C Pa Pe	CC TC EV EM AU	SS RE

(Continued)

Table 2. (Continued).

Paper	Sample	Career stage	Contribution to organising structures	Social agents	Climate(s) contributed to:	Additional contributions
Kimball (2007)	12 collegiate athletes	Invest.		C Pe	AU	RE
La Voi and Babkes-Stellino (2008)	259 youth hockey players	Init. + Spec		Pa.	CC TC EM	
Loughhead and Hardy (2005)	238 Canadian athletes	Spec. + Recreational	Developmental		CC	Correlational link
McCarthy and Jones (2007)	25 sampling/initiation athletes	Init. + Spec.		C Pa Pe	TC EV EM	SS RE
Nitoumanis and Biddle (1998)	356 university athletes	N/A	Developmental	N/A	EM	SS
Pummell <i>et al.</i> (2008)	10 equestrians in spec-invest transition	Spec. + Invest.	Horizontal	C Pa Pe	TC	SS RE
Rees and Hardy (2000)	10 elite athletes	Invest.		N/A	CC	SS RE
Rees and Hardy (2004)	130 'high level' tennis players	Spec. + Invest.		N/A	CC	SS RE
Rees <i>et al.</i> (2007)	320 collegiate athletes	N/A		N/A	CC	SS RE
Reeve <i>et al.</i> (2002)	141 college students	'Uninteresting activity'		C		AU
Reeves <i>et al.</i> (2009)	40 male academy soccer players	Spec/Invest	Developmental	C Pa	EV EM	Qualitative link
Reinboth <i>et al.</i> (2004)	265 adolescent athletes	Spec.		C		AU
Spray <i>et al.</i> (2006)	147 secondary school students	Putting task		C		AU
Strachan <i>et al.</i> (2009)	40 'spec' + 34 'init'	Init. + Spec N/A	Horizontal Developmental	C Pe Pa Pe	TC EV EM	SS RE SS RE

(Continued)

Table 2. (Continued).

Paper	Sample	Career stage	Contribution to organising structures	Social agents	Climate(s) contributed to:	Additional contributions
Ullrich-French and Smith (2006)	186 youth soccer players					
Vazou <i>et al.</i> (2005)	30 young adolescent athletes	(Init.) + Spec.		Pe.	TC EV EM AU SS RE	Correlational link
Weiss <i>et al.</i> (1996)	38 sport programme participants	Init. + Spec.		Pe.	CC TC EM SS RE	
Wylleman <i>et al.</i> (2004)	Review article	Properties of transitions	Horizontal	N/A		

separate meta-interpretative processes were initially set up, one for each career-stage. The joint consideration of these career-stages formed the skeleton across which the analysis of social influences could be overlaid (Figure 2). Once new studies had been assessed against the inclusion criteria, raw themes were harvested and slotted into the appropriate career stage – using the age of the sample as a primary guide but also incorporating any additional information provided (e.g. several studies explicitly recruited from a specific career stage) – prior to being content analysed. This led to the development and maintenance of three pivot tables (available on request from the first author) wherein themes were captured, stored, organised and analysed.

Horizontal structure – sub-climates within the ‘atmosphere’

The second stage of the analysis involved extracting raw themes from studies that identified social motivational considerations in the sporting context, and then establishing potential higher-order categories that might serve to capture and differentiate the numerous themes that were emerging. A total of 618 distinct raw themes were identified, which were categorised into 182 categories: 55 drawn from initiation samples, 70 drawn from specialising stage and 57 drawn from the investment-mastery stage (the pivot tables including *all* raw themes and categories is available from the first author, on request). Figure 2 presents a summary/taxonomy of this analysis, with the seven higher-order themes forming the ‘horizontal’ axis – combining coach (underline), parent (*italic*) and peer (**bold**) influences – and the developmental stages running from top to bottom. The higher-order themes that emerged, replicated across all three climates, were tentatively entitled: ‘performance context’, ‘training climate’, ‘evaluation criteria’, ‘emotion and affect’, ‘leadership and authority’, ‘social support’ and ‘relationships/social bonds’. These labels evolved during the analysis. In an attempt to check and clarify these distinctions, an extra stage of MI was created. Six iterations of the analysis were devoted to building an understanding of their similarities, differences, and relationships. Subsequently, the analyst was satisfied that the proposed seven categories were different in important ways (e.g. minimising redundancy) and yet were sufficiently varied to capture the numerous themes extracted from the studies sampled. The specific ordering of the horizontal structure was informed by an on-going process of trial-and-error, critical reflection and re-engagement with studies until a satisfactory arrangement was reached, positioning sporting-involvement and competence pursuits at one end, and social support and affiliation pursuits at the other. Subsequently, the language of Deci and Ryan’s (1985) Basic Needs Theory was adopted *post hoc* to reflect the observation that the climates on the left hand side of the model (Figures 2 and 3) most closely pertained to meeting a need for feelings of competence, climates on the right hand side of the model most closely pertained to meeting a need for the feelings of relatedness, and climates in the centre of the horizontal axis were associated with supporting or undermining a need to feel autonomous. Processes of consensus validation and peer debrief were also deployed to assess the conceptual coherence of the horizontal structure.

Competition climate

This was the term used to capture the behaviours of social agents during, and immediately before, athletes’ engagement in competitive performances (events,

	Competition climate	Training climate	Evaluation climate
INITIATION-SAMPLING	<ul style="list-style-type: none"> • Mastery emphasis (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Effort emphasis (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Competitive emphasis (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Positive emphasis (approach) (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Negative/pressuring behaviour (<u>Coach</u>, <u>parents</u>, <u>peers</u>) <p><u>In-play decisions/style</u></p> <ul style="list-style-type: none"> • Equal treatment (<u>Coach</u>, <u>parents</u>) • Pedagogic considerations (<u>Coach</u>, <u>parents</u>) • Facilitating practice • Over-involved behaviours • Reinforcing coach advice <ul style="list-style-type: none"> • Groupings • Task design • 1-to-1 coaching • Modelling-demonstration • Informational support • Selection for competition • Emphasising effort in training • Positive rivalry • Collaborative learning 	<ul style="list-style-type: none"> • Evaluation criteria • Personal-mastery • Normative-performance • <u>Fault-finding</u> • Verbal feedback (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Positive (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Negative (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Honesty (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Summative vs. Formative (<u>Coach</u>, <u>parents</u>) • Comparisons (<u>Parents</u>, <u>peers</u>) • Explicit behavioural reinforcement (<u>Coach</u>, <u>parents</u>) • Reinforcing effort (<u>Coach</u>, <u>parents</u>) • Reinforcing outcomes (<u>Coach</u>, <u>parents</u>) • Punishing mistakes • Punishing unsporting behaviour 	
SPECIALISATION	<ul style="list-style-type: none"> • Mastery emphasis (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Effort emphasis (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Competitive emphasis (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Positive emphasis (approach) (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Negative/pressuring behaviour (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • <u>Energising behaviours</u> • <u>In-play decisions/style</u> <ul style="list-style-type: none"> • Equal treatment (<u>Coach</u>, <u>parents</u>) • Pedagogic considerations (<u>Coach</u>, <u>parents</u>) • Facilitating practice • Play/practice with child • Reinforcing coach advice • Over-involved behaviours • Additional instruction • Groupings • Task design • 1-to-1 coaching • Modelling-demonstration • Informational support • Selection for competition • Emphasising effort in training • Competitive emphasis in training • Encouraging competition • Positive rivalry • Collaborative learning 	<ul style="list-style-type: none"> • Evaluation criteria • Personal-mastery • Normative-performance • <u>Fault-finding</u> • Verbal feedback (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Positive (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Negative (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Honesty (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Summative vs. Formative (<u>Coach</u>, <u>parents</u>) • Comparisons (<u>Parents</u>, <u>peers</u>) • Public vs. Private • Timing of feedback • Explicit behavioural reinforcement (<u>Coach</u>, <u>parents</u>) • Reinforcing effort (<u>Coach</u>, <u>parents</u>) • Reinforcing outcomes (<u>Coach</u>, <u>parents</u>) • Punishing mistakes 	
INVESTMENT-MASTERY	<ul style="list-style-type: none"> • Mastery emphasis (<u>Coach</u>) • Effort emphasis (<u>Peers</u>, <u>parents</u>) • Leading by example "Just do your best" • Competitive emphasis • <u>Comp. for places</u> • <u>Mind-games/psych-outs</u> • Positive emphasis (approach) (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Negative/pressuring behaviour (<u>Coach</u>, <u>parents</u>) • <u>Energising behaviours</u> • <u>Challenging-pushing each other</u> <ul style="list-style-type: none"> • Equal treatment (<u>Coach</u>) • Pedagogic considerations (<u>Coach</u>, <u>peers</u>) • Team promote improvement • Groupings • Task design • 1-to-1 coaching • Modelling-demonstration • Informational support • Selection for competition • Emphasising effort in training • Positive rivalry • Collaborative learning 	<ul style="list-style-type: none"> • Evaluation criteria • Personal-mastery • Normative-performance • <u>Fault-finding</u> • Collective performance data • Verbal feedback (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Positive (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Negative (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Honesty (<u>Coach</u>, <u>parents</u>, <u>peers</u>) • Comparisons (<u>Parents</u>, <u>peers</u>) • Balanced • Public vs. Private • Timing of feedback • Personally relevant • Explicit behavioural reinforcement • Punishing mistakes • Reinforcing effort 	

Figure 2. A summary of the main sources of motivational influence across the athletic career span within each sub-climate. Underline = coach, italic = parents, bold = peers.

	Emotional climate	Authority climate	Social support climate	Relatedness climate
INITIATION-SAMPLING	<ul style="list-style-type: none"> Negative emotional responses (Coach, parents, peers) Negative response to mistakes (Coach, parents, peers) Negative response to defeats (Coach, parents, peers) Competitive body language Tolerance Mistakes tolerated (Coach, parents) Defeats tolerated (Coach, parents) Positive-supportive climate (Coach, parents) Happiness following success (Coach, parents) Warm-friendly style Emotional intensity 	<ul style="list-style-type: none"> Facilitating autonomy (Coach, parents) Controlling style (Coach, parents) Maintaining discipline Previous experience of sport Differences between parents 	<ul style="list-style-type: none"> Emotional support (Parents, peers) Material support Conditional vs. Unconditional support Prevalence of conflict 	<ul style="list-style-type: none"> The competence-relatedness 'nexus' Friendship and affiliation Group identity and perceived belonging
SPECIALISATION	<ul style="list-style-type: none"> Negative emotional responses (Coach, parents, peers) Negative response to mistakes (Coach, parents, peers) Negative response to defeats (Coach, parents, peers) Tolerance Mistakes tolerated (Coach, parents, peers) Defeats tolerated (Coach, parents, peers) Joke about/derivate mistakes Positive-supportive climate (Coach, parents, peers) Encouragement after mistakes (Coach, parents, peers) Happiness following success (Coach, parents) Warm-friendly style Emotional intensity 	<ul style="list-style-type: none"> Facilitating autonomy (Coach, parents, peers) Controlling style (Coach, parents) Maintaining discipline (Coach, parents) Importance of expertise / experience (Coach, parents) Differences between parents Maintaining perspective Responses to competition pressures Forming good relationships 	<ul style="list-style-type: none"> Emotional support (Parents, peers) Material support Conditional vs. Unconditional support Prevalence of conflict 	<ul style="list-style-type: none"> The competence-relatedness 'nexus' Friendship and affiliation Group identity and perceived belonging
INVESTMENT-MASTERY	<ul style="list-style-type: none"> Negative emotional responses (Coach, peers) Negative response to mistakes (Coach, peers) Negative response to defeats Tolerance Mistakes tolerated (Coach, peers) Defeats tolerated (Coach, peers) Positive-supportive climate (Coach, parents, peers) Encouragement after mistakes (Coach, peers) Happiness following success Calm influence Emotional range of coach Sincerity of coach emotion 	<ul style="list-style-type: none"> Facilitating autonomy Controlling style Coach accountability Coach knowledge-experience Supporting relatedness amongst athletes Coach reflexivity-adaptability Conflicting-inconsistent coaching 	<ul style="list-style-type: none"> Emotional support (Parents, peers) Watching-spectating Unconditional support Repaying investment Managing career Prevalence of conflict Adopting own behaviour to suit colleagues 	<ul style="list-style-type: none"> The competence-relatedness 'nexus' Friendship and affiliation Group identity and perceived belonging Group culture-historical influences Coach affiliation Coach dedication Coach complementarity (of behaviour)

Figure 2. (Continued)

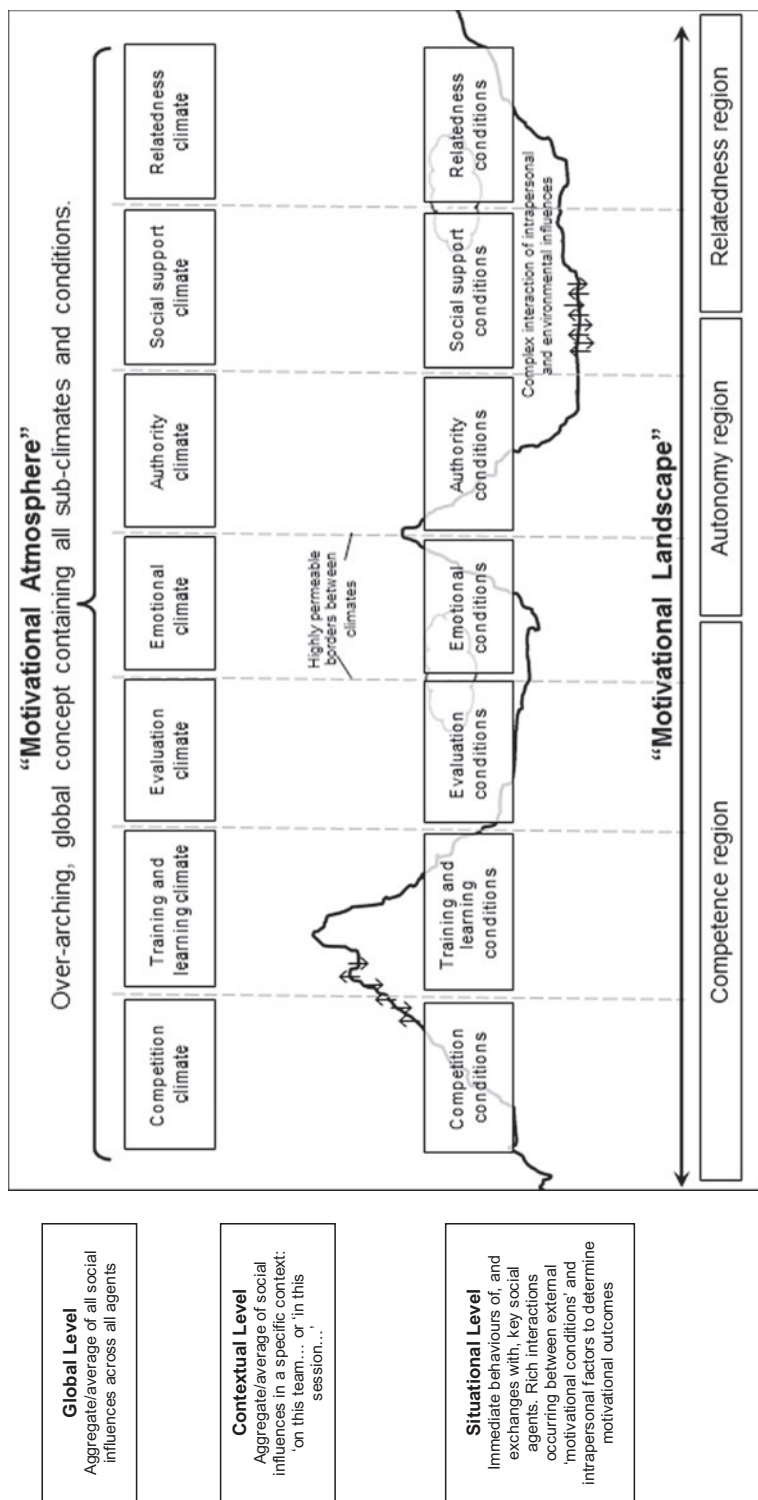


Figure 3. A heuristic model suggesting potential processes, relationships and nomenclature for the study of social and environmental influences on motivation. Momentary motivation (the ‘landscape’) is proposed to be shaped by a complex interaction of the social motivational processes identified in this study (the ‘atmosphere’) and the intrapersonal motivational variables identified elsewhere (the motivational ‘geology’). NB: The ‘atmosphere’ contains several smaller ‘climates’.

Table 3. The developmental structure of the study and the criteria deployed in trying to reconcile study populations or findings with a particular career stage.

Characteristic	Initiation-sampling	Specialisation	Investment-mastery
Approximate ages	4–12 years (8–9 is characteristic)	11–18 years old (12–13 is characteristic)	15–30 (18–21 is characteristic)
Number of sports	Many/diverse	Decreasing/one	One
Deliberate play	High	Decreasing	Low
Deliberate practice	Low	Increasing	High
Nature of involvement/degree of organisation	Play and fun	Increasing structure (usually quite organised)	Organised games and competitions
Role of coach	Task-focused learning	Entry into competitions	
	Helpful/friendly coach	Changing	Specialist coach
	Sometimes coach is not trained	Sometimes transitioning to trained coaches	
Role of parents	Significant parental involvement	Changing	Indirect parental involvement (e.g. spectator)
	Instrumental + material support		May still offer some financial/emotional support
Role of peers	Socialising into sport	Changing	Valuable role supporting emotional needs
	'Functional' role for peers		Pursue perfection and success.
Aims of stage	(1) See if you like it	Develop skills and learn tactics / rules	Maintain those skills which are well-learned
	(2) See if child possesses any skill/potential	Develop fitness and physical attributes	Transition into retirement may be a source of great stress and turmoil for some athletes.
Nature of transition	Relatively seamless – seems to go unnoticed. May accompany switch to secondary schooling	Often quite difficult and marked by significant changes (leaving home, changing coach/team)	

matches, games, etc.). Examples include ‘pre-performance motivating behaviours’ such as emphasising effort (Vazou *et al.* 2005), winning (or not losing – e.g. Gould *et al.* 2008), pressure to perform well (e.g. Babkes and Weiss 1999), as well as the playing style of teams engaged in co-active/interactive sports (inclusive vs. discriminatory – e.g. Weiss *et al.* 1996, Vazou *et al.* 2005). Coaches were sometimes cited as exhibiting and conveying passion and energy (e.g. Keegan *et al.* 2010b, *in press*), while peers (opponents and team-mates) were noted by the investment athletes to engage in mind games and ‘psych-outs’ (Keegan *et al.* *in press*).

Training climate

This referred to the situations in which training and learning occurred. It was separated from the competitive climate as activities undertaken here were not formally competitive, but often in preparation for competitions (e.g. fitness, tactics, technique). The element of learning was largely addressed through the way the coach organised and delivered training, but it also encompassed parent influences (for initiators and specialisers) and peer influences (for specialisers and investment-mastery athletes). The training climate included the ways that effort and improvement are emphasised in training (e.g. Vazou *et al.* 2005, Keegan *et al.* *in press*), as well as competition and rivalry (including ‘positive rivalry’ – e.g. Weiss *et al.* 1996, Keegan *et al.* *in press*). ‘Selection’ was also included under this climate, as it referred to an organisational element of the coach’s role and frequently occurred outside of the performance/competition context (see Figure 2).

Evaluation climate

This climate referred to the ways in which performance is assessed and feedback is provided. While evaluation can occur within both training and competition, it was drawn into a separate theme as it could also occur outside training/competition, and these aspects of sport could, in theory at least, occur without any formal evaluation taking place (e.g. play and fun, especially concerning career-initiators). This climate contained references to: (1) *evaluation criteria* – the ways in which athletes believe/infer that they are being assessed (normative, mastery, effort/attitude, fault-finding – e.g. Keegan *et al.* 2009, 2010b, *in press*); (2) *verbal feedback* (e.g. Beltman and Volet 2007, Gould *et al.* 2008, Holt *et al.* 2009) – the relatively explicit evaluative communications of coaches, parents and peers, including criticism and praise and also referring to considerations such as timing, publicity (public vs. private); and (3) *behavioural reinforcement* (e.g. McCarthy and Jones, 2007) – the punishment or rewarding of outcomes, effort, moral behaviour etc. almost exclusively driven by coaches and parents (only coaches at the elite level – Keegan *et al.* *in press*).

Emotional climate

This was the term used (cf. Darling and Steinberg 1993) to capture the emotional and affective displays of key social agents. It was maintained as a separate entity from evaluation climate, because while emotions can be displayed in evaluating performance, they can also occur in relation to issues surrounding authority, relationships, or general affective style (e.g. a generally moody, easily angered coach). As such, this relatively global construct was situated in the middle of the ‘climates

spectrum': being just as relevant to competition and performance as it was to social relationships and group dynamics. It was broadly broken down into positive reactions (e.g. Conroy and Coatsworth 2007b), tolerant reactions and negative reactions (e.g. Vazou *et al.* 2005, Keegan 2010b), with athletes also referring to 'emotional intensity' of the protagonist, as well as the 'emotional range' of the coach – reflecting the ability to be calm, passionate, or measured in relation to the moment and situational demands (Keegan *et al.* *in press*).

Authority climate

This climate captured the repeated references to 'leadership style' in the various studies reviewed, but the specific reference to 'leadership' was gradually questioned and dropped on the grounds that it contains connotations of leadership from within, as well as from the front. Instead the term 'authority' was chosen to reflect that this climate is driven by the manner in which *those in positions of authority/responsibility* (mainly coaches and parents) fulfil this role. It should be contrasted with autonomy-support, which was referenced throughout and could be supported (or undermined) by any social agent. Hence, to be clear, autonomy-supportive behaviours were evident across all seven climates mentioned herein, but the authority climate refers specifically to the way those in authority deploy that power. To a large extent, this precluded the contribution of peers to this climate, as peers are less frequently placed in positions of authority over each other (except captaincy, but this can be assigned quite inconsistently between different teams). Coaches and parents appeared to dominate the authority climate, but the influence of parents reduces significantly between the specialisation and investment-mastery stages (e.g. Reeve *et al.* 2002, Vazou *et al.* 2005, Conroy and Coatsworth 2007a, 2007b, Garcia Bengoechea and Streaan 2007, Gould *et al.* 2008, Holt *et al.* 2008, Fraser-Thomas and Côté 2009, Keegan *et al.* 2009, 2010b, *in press*, Gearity and Murray 2011).

Social support climate

This climate contained all the numerous behaviours of social agents that contribute directly and indirectly to the athlete's participation in, enjoyment of, success at, and benefitting from, sport. Key dimensions of social support are: (1) emotional support (e.g. comfort, validation, 'there for you' – McCarthy and Jones 2007, Gould *et al.* 2008, Holt *et al.* 2008, Pummell *et al.* 2008); informational support (e.g. advice and guidance); (2) tangible (material/instrumental) support (e.g. concrete instrumental assistance such as purchasing equipment and providing transport – as noted by Beltman and Volet 2007, McCarthy and Jones 2007, Garcia Bengoechea and Streaan 2007, Gould *et al.* 2008, Holt *et al.* 2008, Pummell *et al.* 2008); and (3) esteem support (bolstering self-confidence and providing reassurance – cf. Rees and Hardy 2004). Parents and peers were found to offer substantial emotional support throughout the career, and this was frequently cited in relation to motivation (e.g. Keegan *et al.* *in press*). Even in this climate, however, the parent influence appeared to be reduced upon entry into the investment-mastery stage. During initiation-sampling and specialisation, parents provided extensive material support, as defined earlier, but this was reduced once athletes became independent (around the time of entry into investment-mastery). The presence, severity, and resolution of conflict between peers was included, in relation to emotional support and esteem support – that is,

the extent to which an athlete felt social support was available from their peers (e.g. Weiss *et al.* 1996). While the coach undeniably offers informational support in the form of advice and instruction, this was included under the training climate and so was not listed here in order to avoid duplication/redundancy. There was also an interesting theme concerning the ‘conditionality’ of social support – particularly from parents – wherein support was either unconditional, or had ‘strings attached’ such as being weighed against success or even used to build a feeling of ‘indebtedness’ (e.g. Gould *et al.* 2008, Pummell *et al.* 2008).

Relatedness climate

This was kept distinct from social support, because it could be viewed as extending beyond ideas of informational support, material support, and perhaps even the emotional support aspect (i.e. consoling or confiding does not necessarily lead to – or derive from – friendships, affiliation or group membership). *Relatedness climate* referred to all the elements of sport participation associated with seeking *both* friendship/affiliation *and* group membership/belonging (e.g. Weiss *et al.* 1996, Allen 2003, Farrell *et al.* 2004, Vazou *et al.* 2005, Kimball 2007). These two concepts were evident in all three career stages, along with the idea of a ‘competence-relatedness nexus’ – an inherent link between levels of athletic competence shown and either making/losing friends or being accepted into the group (cf. Evans and Roberts 1987). This link could either be fostered by effectively making friendships/acceptance contingent upon competence, or it could be de-emphasised by separating friendships/acceptance from what happens ‘on the pitch’ (e.g. Keegan *et al.* 2010b). Such separation appeared more likely in elite performers who viewed their performances, in quite a professional way, as unrelated to who they befriend; whereas the link was rather immediate for younger athletes (as noted in Keegan *et al.* 2009, *in press*). At the investment-mastery stage, peers were sometimes described as maintaining a cultural-historical feeling of privilege regarding certain teams/clubs (e.g. ‘it means a lot to put on this shirt’ – Keegan *et al.* *in press*). Also at the investment-mastery stage, the relationship with the coach emerged quite strongly as a motivational influence, needing to be friendly/close, dedicated, and complementary (e.g. ‘on the same wavelength’ – e.g. Farrell *et al.* 2004, Kimball 2007) in order to present optimal conditions for athlete motivation. This relationship, however, also appears to be a conduit through which many other coaching behaviours are viewed and interpreted. Praise from a coach who is close might be praise indeed; whereas praise from an aloof, disliked coach might be viewed as controlling, sarcastic or empty. This aspect of the coach/athlete relationship was very difficult to detect in the initiators and specialisers.

Comparison between career stages

Comparing across Figure 2’s developmental dimension permits a preliminary comparison of the changes that occur across the career span in terms of behaviours that are reported to be motivationally relevant in each career stage (NB the frequency and relative influence of such behaviours cannot be judged using the data obtained). In the competition climate, emphases on mastery, competition, effort, positivity, and pressure/negativity were reported as being motivationally relevant at all three career stages, although a closer inspection of the findings suggests that parents

play a much reduced role in the investment-mastery stage. In-play decisions (playing style) was an issue identified relating to peers, especially in team sports, but this influence was not identified in the investment-mastery stage, perhaps because inclusive-vs. -discriminatory playing style cannot be afforded at this level (i.e. excluding a team-mate from play may mean losing a match/opportunity). Likewise, the coach was identified as exerting a passionate/energising influence in specialising and investment athletes, but not career initiators. Speculating as to why this may be: perhaps such passion may be intimidating to the (generally young) career-initiators, or perhaps it is difficult to incite passion in athletes who are merely sampling a sport.

The training, evaluation and emotional climates all contained similar themes when comparing between career stages. Once again, the main differences related to which social agents were supporting aspects of each climate, following the general pattern of parents being; 'squeezed out'. In the training climate, coach influences (chiefly based around training/instruction) remained very similar, whereas parent influences had almost vanished by the investment-mastery stage. The evaluation and emotional climates appeared to develop not in terms of different themes, but rather the coach(es) appeared to become the central source of evaluative information.

The authority climate developed slightly differently, and while a distinction between facilitating autonomy vs. controlling behaviours was apparent throughout, the over-riding shift was that by the elite level, the coach is the only remaining authority figure, meaning that all the identified influences at the investment-mastery level pertained to the coach. The social support climate made consistent references to emotional support, material support, and the presence/absence of conflict. References to informational support were generally classified under the training climate, as they largely contained information about the sport (e.g. technique, training tips, career planning etc.). These three attributes are consistent with the sub-scales of social support identified by Rees and Hardy (2004), whereas references to esteem support appeared to be spread throughout the whole motivational atmosphere as described in this study (e.g. positive feedback, building confidence before games, tolerance/encouragement after mistakes).

The relatedness climate was dominated by the consideration of friendships between peers, feelings of belonging to a meaningful peer-group, and the way in which sporting competence can be associated with popularity amongst the peer group. At the investment-mastery level, the relationship between coach and athlete appeared to become a key consideration. The majority of parent influences that might have been classified in this climate were subsumed under the social-support climate in an attempt to avoid duplication/redundancy. Overall, the analysis suggested that the role of parents decreases markedly around the transition to investment-mastery, while the role of peers and coaches gradually increases across the athletic career and, by some reports, 'fills the gap' left by parents.

An appraisal of processes, relationships and nomenclature

A recurring query throughout the project was the use of the term *motivational climate* (Nicholls 1989, Ames 1992). However, as part of the conduct of this MI, terms such as *emotional climate* (Darling and Steinberg 1993, p. 488, Holt *et al.* 2009, p. 38) and *autonomy supportive climate* (Ommundsen and Kvalø, 2007, p. 389) were identified in relation to the social and environmental motivational influences (see Figure 2). These suggested a potential sub-set of climates that possess relevance to a broader

motivational construct. These observations and reflections – combined with the inherent association of ‘motivational climate’ to AGT – led to the consideration of a different nomenclature and ideology, in order to try and represent the multifaceted nature of the phenomena being studied.

Motivational atmosphere and motivational meteorology

Building from the concept of a *motivational atmosphere*, suggested by Keegan *et al.* (2010a and 2010b), a meteorological model was developed to more adequately represent the rich complexity of the social influences on athlete motivation. The findings of the current paper suggest a ‘horizontal’ range from competition and training climates at one end to social support and relatedness climates at the other, and a developmental series of career phases from sampling/initiation to mastery/investment, with a period of specialisation in between. Finally, reflecting Vallerand’s (1997) distinction between global, contextual and situational influences, the modelling process conducted during this study proposes a broad/global *motivational atmosphere*, containing a series of contextual *climates* (competition, training, evaluation, emotion, authority, social support, and relatedness), which are effectively the aggregate of many instances of momentary/situational *motivational conditions*. The model developed in this analysis highlights that, whilst motivational conditions may be objectively observed quite readily, current approaches favour the use of broad subjective perceptions when examining the levels of climate and atmosphere. However, there is nothing to prevent these levels being calculated from on-going, comprehensive and accurate/reliable observation of specific motivational conditions (and their consequences) – in the same way that broad patterns of weather can be forecast based on specific observations such as barometric pressure or relative humidity.

Following from the above, it was reasoned that the way we study the social influences on athlete motivation may need to be updated, in order to more adequately capture the complex nature of the motivational atmosphere. For example, rather than being conceptually ‘clean’ and separable, the data in this study suggest that each contextual climate (competition, training, evaluation, emotion, authority, social support, relatedness) influences the next in a complex system. Hence, reflecting the study of meteorology, the borders between climates in the proposed model are relatively permeable and it is difficult to specify where one ends and the next begins (see Figure 3 – notably this conceptual inter-dependence and co-variance would be a problem for questionnaire based research, but it may reflect the objective reality of the social milieu). Further to this, the immediate motivational conditions are most likely to influence the athlete’s momentary motivation, but they also interact very significantly with each other in producing motivational consequences (e.g. goal complexes – cf. Elliot and McGregor 2001). These are testable hypotheses generated by the model in Figure 3.

The meteorological analogy that emerges from this analysis might seem cumbersome and complicated, but it is worth noting that meteorologists are frequently able to predict the weather with surprising accuracy. In order to achieve this success, however, meteorologists require a detailed understanding of the atmosphere, climates and conditions, along with their nuances, interactions and interdependence. A simple dichotomy (e.g. hot vs. cold, wet vs. dry) can be a useful rule-of-thumb, but does not adequately differentiate between atmosphere, climate and conditions.

Neither does it afford the scientist a full and functional understanding of the phenomenon under study.

'Motivational landscapes' and 'motivational geology'

This study has reviewed a broad range of research into the social and environmental influences on athlete motivation. The motivational atmosphere, its climates and conditions all act to influence and shape the athlete's motivation. The simplest way of envisaging this effect is to invoke the idea of a landscape. In the same way that wind, rain, snow, rivers and ice can help determine a topography, the effects of the motivational atmosphere (and its contents) can be thought of as shaping a *motivational landscape* – both in the immediate moment and in the sense of longer term socialisation effects. For example, the rock-forms of the Arizona desert are formed by the action of dry sand being blown by the strong winds (i.e. the atmosphere), slowly carving the boulders into new and novel shapes. The characteristics of the landscape are determined by the interaction of the landscape itself (e.g. geology) with atmospheric conditions (e.g. meteorology). Similarly, the intrapersonal variables that have been studied in relation to motivation (need for achievement, fear of failure, desire for social approval, etc.) will have a significant influence on both the pattern of motivation observed (landscape), and the way in which the atmosphere impacts on that landscape. This MI has explicitly excluded a consideration of these intrapersonal variables and their relationship to the social environment, but these would appear to be an important avenue for research in this area as it progresses. Overall, however, the argument that research methodologies may benefit from attempting to reflect a rich, complex and highly variable subject matter may be applied equally to intrapersonal (geology) and interpersonal (meteorology) influences on athlete motivation (i.e. the motivational landscape).

Such a change in methodological approach would be radical, but the current findings (and the experiences of conducting this research, described in limitations, below) raise the question of whether real progress is being made in the current questionnaire based 'correlation-ad-infinitum' paradigm. Whilst questionnaire methodologies are relatively accessible, convenient and sometimes quite impressive (e.g. the sheer number of statistics generated and apparent strengths of correlations or 'predictor' variables): (1) the emphasis on subjective measurements overlooks the fact that athletes with the same coach can make substantially different appraisals of the motivational climate (e.g. Papaioannou 1994, Cumming *et al.* 2007), and therefore overlooks the *interaction* of person and environment in determining motivation; and (2) the nature of questionnaire development emphasises parsimony and conceptual independence (e.g. cross loadings are discouraged wherever possible), and yet the social (and even the intrapersonal) factors determining motivation appear, on the basis of this research, to be highly inter-dependent (Goudsblom 1977, Bryman 2004). Notably, however, this does not necessarily constitute an argument for the abandonment of quantitative methods in studying social motivation, but rather the refinement and improvement of the quantitative methods we deploy. It must be possible to accurately identify and measure many, if not all, of the many-and-varied motivationally relevant behaviours that constitute a motivational atmosphere. These various complementary measurements can then be combined to predict and model the motivational atmosphere in a much more sophisticated manner – a manner that might begin to explain why athletes of the same coach give

different scores on a questionnaire regarding coach-initiated motivational climate (cf. Papaioannou 1994, Cumming *et al.* 2007), or why the same coaching behaviour can lead to significantly different outcomes depending on the context (cf. Keegan *et al.* 2009, 2010b). Any developments in our ability to capture the complexity in the social determination of athlete motivation would, arguably, represent a much more significant advancement of the field than any further studies suggesting that one concept (or collection of concepts) correlates with another concept (remembering that correlation is never causation – Aldrich 1995).

Conclusions

This study conducted a qualitative synthesis of the social and environmental motivational influences experienced by athletes across their careers, using the MI methodology (Weed 2006, 2008). The emerging analyses demonstrate a rich and evolving motivational atmosphere across the athletic career. The overall taxonomy of social and environmental influences across career stages (Figure 2) describes three motivational atmospheres which contain: consistencies across the athletic career; differences between career-stages that appear consistent with maturational and developmental changes; and clearly identifiable resonances with existing theoretical and empirical work. These represent arguments for qualified claims to internal and external consistency that, taken together, might constitute a case for the open-minded consideration of the analysis and its findings.

The motivational atmosphere model that has emerged as a result of this analysis (see Figures 2 and 3) is characterised by rich and multifaceted interactivity between behaviours in influencing motivation – in a manner that better reflects the complex social milieu experienced by athletes participating in sport. This conceptualisation has been analogised with the meteorological study of the atmosphere, climates, and conditions (i.e. the weather), in a manner consistent with those studies that have been calling for a deconstruction of the social-motivational milieu in order to facilitate a fuller understanding (Elliot 1999, Smith *et al.* 2007, Keegan *et al.* 2009 2010b). Hence, while the contribution of key theories such as AGT and SDT should not be underestimated by any means, maintaining, for example, a simple dichotomy between task and ego goals would appear to be a potential impediment to future research, akin to simplifying the study of meteorology to the study of hot vs. cold weather conditions. However, echoing the meteorology metaphor being deployed here, task, ego, competence, autonomy and relatedness considerations do seem to permeate the motivational atmosphere, as do considerations of the approach-avoidance distinction (Elliot 1999). Searching the themes identified in this study for indices compatible with each theory will return numerous results. Arguably, the danger in allowing any single theory to steer one's understanding of the motivational atmosphere is that it may preclude a fuller and more nuanced understanding of the various ways that athlete motivation is socially influenced.

To many researchers, the most notable limitation of this study in the context of a field dominated by quantitative methods and positivist philosophical assumptions, is the heavy reliance on interpretation and, in particular, the interpretation of other papers' results/findings (cf. Hagger and Chatzisarantis 2011). While 're-interpreting' such findings was avoided as much as possible, it was necessary to *continue* interpreting other authors' findings once they had been extracted into the current analysis – i.e. leaving the original interpretations intact but combining, critically comparing

and classifying them. Inherent in a study such as this is the creative, often unstructured process of theory-building ('bricolage' – Levi-Strauss 1966; or 'bisociation' – Koestler 1976). In considering the impact of such a limitation, it may be helpful to pause and consider where all existing theories have come from. Are there clear records of their development or were they also produced creatively, or in 'flashes of inspiration'? How consistent were they with the existing theories of the time? To what extent are tests of credibility/trustworthiness necessary in the theorising process? In defence of the current study, these procedures have all been deployed as early as possible: this study has attempted to demonstrate transparency and trustworthiness throughout, as well as to incorporate critical discussion at every stage (data collection, data analysis, private reflection, member checking, consensus validation, peer-debrief, clear audit trail, and full disclosure of data/findings).

A second limitation is the relative lack of research papers that were compatible with an inductive, data-driven approach. On examining the inclusion/exclusion criteria (specified earlier), it became clear that hundreds of studies in the area adopted, *a priori*, a single theory or theory-informed measurement tool and correlated questionnaire-derived data – often in an attempt to 'test' or 'extend the applicability' of the theory. This was not compatible with the aims of the current study.

In the process of conducting the meta-interpretive analysis, a framework emerged in which 63 areas of interest were identified: three career stages, by three social agents, by seven 'climates'. Upon searching the literature in order to populate these areas, many of the searches returned no studies of relevance. In particular, the initiation and investment-mastery career-stages were difficult to populate. Hence, each of these 63 individual categories represents an opportunity for investigation, and even then, many of the themes within each box are worthy of further study in their own right. Not only would synthesis studies, such as this one, benefit from independent collaboration (or correction/refutation) but equally, concepts within the proposed motivational atmosphere may benefit from additional clarification.

The present study suggests there is potential in seeking to elucidate the relationships between climates (competition, training, evaluation, emotion, authority, social-support and relatedness) – as well as examining the ways in which specific motivational conditions interact with both each other and the athlete's intrapersonal characteristics in shaping the athlete's short and long term motivation. In its current format, the meteorological model would suggest that increased distance between climates in the horizontal structuring of the model (i.e. horizontal with respect to Figures 2 and 3) might predict decreased correlations between the constructs within them. However, there is no clear delineation proposed between climates, simply degrees of separation: shades of grey. Likewise, the present conceptualisation would predict stronger correspondence between the immediate behaviours of social agents (motivational conditions) with immediate motivated behaviours, whereas a more general average of the motivational conditions (the climate) would be less consistently associated with immediate motivated behaviours, but show more correspondence with general attitudes towards sporting involvement. In total, the above-proposed programme of inquiry might represent several careers' worth of research, but it would be research that is philosophically grounded, theoretically and empirically informed, and – if the arguments presented here are accepted – more methodologically suitable for the study of social-motivational processes.

Notes on contributors

Richard Keegan is assistant professor in Sport and Exercise Psychology at the University of Canberra. He completed his PhD and MSc at Loughborough University following a BSc (Hons) in Psychology from the University of Bristol. He is a member of the Australian Psychological Society and an AHPRA Registered Psychologist.

Christopher Spray is senior lecturer in Sport and Exercise Psychology at Loughborough University following a BA (Hons) in Sport and Recreation Studies from North Staffordshire Polytechnic and a PGCE from Loughborough University. He completed a PhD at the University of Exeter and is also an associate fellow and Chartered Psychologist of the British Psychological Society.

Chris Harwood is reader in Applied Sport Psychology at Loughborough University, and is currently the Vice-President of the European Federation of Sport Psychology. He was awarded a BASES Fellowship in recognition of his contribution to applied sport psychology in the UK and long term services to BASES in promoting the development of psychology as a sub discipline of sport science.

David Lavalley is currently Head of the School of Sport at the University of Stirling. His academic qualifications include a Master's degree from Harvard University and a PhD from The University of Western Australia. He is an associate fellow and chartered psychologist of the British Psychological Society. He is also chair of The Psychologist Policy Committee for the British Psychological Society.

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