

Central Lancashire Online Knowledge (CLoK)

Title	Professional judgement and decision-making in the planning process of high-level adventure sports coaching practice
Type	Article
URL	https://clock.uclan.ac.uk/15655/
DOI	##doi##
Date	2016
Citation	Collins, L., orcid iconORCID: 0000-0002-7478-1140 and Collins, D. orcid iconORCID: 0000-0002-7601-0454 (2016) Professional judgement and decision-making in the planning process of high-level adventure sports coaching practice. <i>Journal of Adventure Education and Outdoor Learning</i> , 16 (3). pp. 256-268. ISSN 1472-9679
Creators	Collins, L., and Collins, D.

It is advisable to refer to the publisher's version if you intend to cite from the work. ##doi##

For information about Research at UCLan please go to <http://www.uclan.ac.uk/research/>

All outputs in CLoK are protected by Intellectual Property Rights law, including Copyright law. Copyright, IPR and Moral Rights for the works on this site are retained by the individual authors and/or other copyright owners. Terms and conditions for use of this material are defined in the <http://clock.uclan.ac.uk/policies/>

This is a pre-proof corrected manuscript, as accepted for publication, of an article published by Taylor & Francis in *Journal of Adventure Education and Outdoor Learning* on 6th April 2016. Available online:

<http://www.tandfonline.com/doi/abs/10.1080/14729679.2016.1162182?journalCode=raol20>

PLEASE REFER TO THE PUBLISHED VERSION FOR CITING PURPOSES

Professional Judgement and Decision Making in the Planning Process of High Level Adventure

Sports Coaching Practice

Loel Collins

Institute of Coaching and Performance

University of Central Lancashire

LCollins2@uclan.ac.uk

Dave Collins

Institute of Coaching and Performance

University of Central Lancashire

DJCollins@uclan.ac.uk

Abstract

This investigation examined the planning and decision-making processes in Adventure Sports Coaching. We utilised a thematic analysis approach to investigate the planning decision-making practices of a sample of high-level Adventure Sports Coaches over a series of sessions. It was discovered that, in planning coaching activity, high-level adventure sports coaches draw on their epistemological values, domain specific expertise, employ a synergy of classic and naturalistic decision making processes, and continually audit the evolving coaching process. Based on these findings, implications for professional training, accreditation, and development of adventure sports coaches are presented.

Keywords: Adventure sports, Planning, Decision making

Professional Judgement and Decision Making in the Planning Process of High Level Adventure Sports Coaching Practice

Examining the impact of personal philosophy on the coaching process, Collins, Collins and Grecic (2013) highlight the epistemological values held by a small group of high-level adventure sports coaches. Building from ideas already developed in parallel professions such as teaching, Collins et al considered the existence of an epistemological chain that links the epistemological beliefs to practice in the field. They proposed that the epistemological chain acts as a framework for a reflective/auditing process that characterises the dynamic coaching practice prevailing in high-level adventure sports. Under this proposed structure, the epistemological chain supports planning, pedagogy, professional development, analysis, and professional judgement and decision making in the coaching activity: in short, the epistemological chain is proposed as a fundamental building block of the eventual coaching behaviour, in both the immediate and longer term. Professional judgement and decision making is common across all coaching and teaching environments, (cf. Nested Thinking; Abraham & Collins, 2011; Martindale & Collins, 2010). The dynamic challenge of the adventure sport environment adds to the professional judgement and decision making load with an additional and significant emphasis on pre-session, in-session, and post-session thinking (Collins & Collins, 2013), the hyper dynamic nature of adventures sports coaching (Collins & Collins, 2014) requires the adventure sports coach to have a detailed, flexible and adaptable plan in which variable and options are considered and anticipated.

Reflecting these issues, the purpose of this particular paper is to investigate the manifestation of the epistemological chain in practice. Namely, in what ways (if at all) does the belief structure impact the professional judgement and decision making process? This paper outlines some of the findings from a larger study that has investigated the “How’s, What’s, and Why’s” of professional judgement and decision making in adventure sports coaching. Considering the characteristics of effective coaching practice hypothesised above, we focus on how decision making in pre-planning and in-action planning is utilised to facilitate the management of key variables within the dynamic

environment. To provide a theoretical context to this purpose, we firstly outline dual process theories that we suggest underpin professional judgement and decision making in practice,

Dual Process Theories and Professional Judgement and Decision Making in Adventure Sports Practice

Effective judgment is valued by adventure sports coaching (Cain & McAvoy, 1990; Petzold, 1984; Preist & Gass, 2005), a characteristic which is seen as a product of experience and reflection. In contrasting perspectives, Drury, Bonney, Berman and Wagstaff, (2005) and Priest and Gass (2005) have considered the professional judgement and decision making of outdoor leaders and coaches as a rational process, while Galloway (2007) has explored a naturalistic process of decision making in the field. Notably, however, Collins and Collins (2013) propose that a synergy of the two processes may characterise professional judgement and decision making in adventure sports coaching. These professional judgement and decision making's manifest themselves in apparently intuitive actions, primarily as a result of time and environmental pressures, which, we contend, must be the product of some form of reflective act (Collins & Collins, 2013). In this regard, Martin, Cashel, Wagstaff, and Breunig (2006) comment that the product of reflection is the knowledge (tacit or explicit), which underpins good judgment. Accordingly, Collins and Collins hypothesised professional judgement and decision making as a complex, synergetic process that is facilitated via reflection in some form. Notably, the relationship between these two 'styles', the intuitive (part one) and algorithmic (part two) of dual process theories (Stanovich & West, 2000), is time consuming, time pressured, and both implicit and explicit in nature (cf. Moshman, 2000): all of which has to be accommodated in the coaching process. As a potential resolution to these challenges, Cleermans and Jimenez's (2002) dynamic graded continuum framework may offer more consideration in this context in that professional judgement and decision making combines the logical and intuitive both within a single decision that is nested or linked within a broader planning process.

Supporting this idea of linked processes, Bannigan and Morres (2009) identify the relationship between reflective and evidence based practice encapsulating it in a model of professional thinking akin to the concept of professional judgement and decision making. Logically

this interplay must also be linked to the coach's intention to act. The reflective and evidence based practice with an intention informs the professional judgement and decision making process enabling the flexibility, adaptability and creativity required in the dynamic coaching environment that characterise adventure sports coaching. For example, the individualised and differentiated aspect of high-level adventure sports coaching practice would make a formulaic approach meaningless. However the constant auditing of the coaching and learning process for each individual within a group generates a high cognitive load on the coach. Building on definitions of professional thinking by Donaghy and Morss (2000), Bannigan and Morres (2009) describe the professional thinking required to execute individualised interventions as demarking a professional status. Reflecting the challenges of time pressure and cognitive loading, however, to what extent does pre-planning enable these individualised interactions?

The decision making process may be physically positioned within the changing environment to enable the decision making process to operate, for example, the use of terrain. Equally, the decision making process may be linked to the environment or the structure of the session or whole activity. Accordingly, the adventure sports coach will make decisions in various ways, based on experience, anticipation and an on-going learning process, all while anticipating the future impact of decisions on the environment and student development. Pre-action planning by the adventure sports coach may manage the in-action professional judgement and decision making process by reducing the variables that may be encountered during the session. Logically, such pre-planning is non-time pressured, has access to a wide amount of relevant information, and can be audited and re-audited at any point prior to the actual start of the session.

This pre-action planning may act in similar fashion to operating procedures; in this respect this acts as a mechanism to reduce the cognitive load in action. Militello and Hutton (1998) proffer that as more of the "procedural or predictable elements of a decision are replaced by procedures, the decision maker becomes responsible for more complex aspects of the process such as 'inference, diagnosis, judgement and decision making'" (p. 1618). Once again the duality of the professional judgement and decision making process and the interaction of the different approaches becomes

critical to understand. Does the adventure sports coach utilise procedural processes to decrease the cognitive load in action or in session?

Thus, several questions emerge which help to structure the empirical examination of professional judgement and decision making in adventure sports coaching. Does the adventure sports coach manage the variables in the decision making process? Is this predominantly conducted via pre-action planning? How exhaustive is the planning? And what underpins this pre-action professional judgement and decision making process?

Method

In line with the stated aims of this study a thematic analysis provides an in depth investigation of the themes that occur and reoccur throughout the professional judgment and decision making over a series of sessions. In this case, the “dynamic processes” are explored by combining semi-structured interviews with video footage relating to real coaching sessions delivered by the participants (Lyle, 2003; Muir & Beswick, 2007; Rosenstein, 2002). The video was used to stimulate the interview process and deepen the content and richness of the resultant data (cf. Cohen & Manion, 1994).

Participants

Data sources included interviews with five expert British adventure sports coaches ($M_{age} = 50.3, s = 9.1$), together with video and semi-structured interviews relating to 10 (2 per participating coach) un linked sessions of adventure sports coach practice. Inclusion criteria included: (a) holding multiple British Canoe Union (BCU) Coach Level 5 awards and/ or national coaching roles; (b) actively engaged in adventure sports coaching activity; (c) active as an adventure sports coach educator; (d) willing to unpack and reflect on their own coaching practice; (e) holding a coaching qualification in at least one other adventure sports and; (g) availability.

No incentive was offered and specific demographic information has been withheld to protect anonymity. In addition detail of location or group members has been disidentified to avoid the potential for deductive disclosure given the small group of potential participants. Purposive sampling

was used to ensure a seniority, experience, and inherent quality (at least of self-reflection) in the participants in order to generate a picture of high-level performance. Thus, the participating coaches had a combined 157 years of adventure sports coach experience in white water kayaking, sea kayaking, surf kayaking, canoeing, mountaineering, rock climbing, mountain biking, cross country, telemark, and alpine skiing; the coaches enjoyed high-status reputations within the field and were all active as participants in adventure sports and coach education. In the absence of more effective or objective markers (Nash, Martindale, Collins, & Martindale, 2012), we were confident that this sample presented a picture of good practice and high level performance and the steps taken avoid potential identification of participants.

The primary investigator is a 46-year-old male and has 25 years of experience as an adventure sports coach within the National Centres in the UK. He was a coach educator for the BCU and holds the BCU's Level 5 Coach award in four disciplines, in addition to being a qualified mountaineering and ski instructor. Reflecting these characteristics and the small group of potential participants, the researcher had a good rapport with the participating coaches as a colleague and fellow professional coach. This established rapport facilitated honesty and openness in the interview process.

Procedure

The investigation followed a 4-stage process in which a pre-project, semi-structured interview was completed to gain data on the overall philosophy and epistemology of each participant coach. Subsequent pre-session, semi-structured interviews, observation, video of two real un linked sessions, and post-session interviews generated a videotext for each session. Interview guides were constructed and piloted with three similarly qualified coaches and were adjusted before use ([Tables I–III](#)). The guides were used to scaffold the interview process; however, depending on the breadth and depth of answers provided, they were not always utilised and questions were not always asked verbatim. This approach allowed emergent themes to be explored, revisited, and reconsidered. The empathetic, openly structured interviews varied in length (M duration = 56 min) after initial briefing and orientation questions; interviews were held in a location and at a time agreed with the participants,

digitally recorded (an Olympus VN-713PC digital voice recorder) and transcribed using a commercial transcription service. Sessions were video recorded using a discrete digital chest mounted camera (a Hero 2HD by GoPro Inc.), one worn by the participating coach and a second by the primary researcher during the session.

Data analysis

The videotexts were read several times and reviewed in line with procedures suggested by Aronson ([1994](#)), Braun and Clarke ([2006](#)), and Fereday and Muir-Cochrane ([2006](#)). Firstly, the videotexts were read and corrected while listening to the original digital recording in order to be able to imagine the voice of the participants in later reads and to assist in a more “complete analysis” (Smith, Flowers, & Larkin, 2012, p. 82). During subsequent readings, these videotexts were reconsidered in terms of common, recurring, and underlying themes. As primary themes and initial themes (Miles & Huberman, 1994) emerged, they were grouped, categorized and coded as appropriate. All coded data were then reviewed; relationships were identified and a thematic map was generated (Crabtree & Miller, 1999). The thematic map was subsequently reviewed to identify internal and externally coherent patterns of themes. From this thematic map, the themes were further defined and refined. The thematic analysis method adopted in this study was a hybrid of approaches, incorporating an inductive, data-driven method (Boyatzis, 1998) and the use of themes (Crabtree & Miller, 1999). The relationship of findings in this study and those outlined in Collins et al. (2014) were considered throughout the discussion.

To enhance the study’s trustworthiness, bracketing was utilised (Morrow, 2005). A reflective and reflexive commentary throughout the process, bracketing personal experiences and considering the influence of personal values during the interviews and analysis (Smith, 2011), was maintained. The bracketing process enables the “essence of an experiential structure to be intuitively grasped and isolated” (Loland, 2007, p. 107). Furthermore, this systemic reflection enables the researchers to

“bring to light... hidden meanings and qualities” (Loland, 2007, p. 107) and resulted in the focusing and refocusing of the semi-structured interview in response to the participants’ contributions. This resulted in the focusing of the semi-structured interview in response to the participants’ responses and greater exploration of the participants’ reasoning within the interviews. The triangulation of data from interviews and video further enhanced the credibility of the study (Morrow, 2005).

External and internal member checking was also utilised post-analysis to guard against misinterpretation and researcher subjectivity, and to increase credibility (Morrow, 2005). Two independent investigators, an academic colleague and a practitioner colleague within the same faculty, served as external auditors and provided feedback from related but differing perspectives. The participating coaches were also provided internal checks (Sparkes, 1998). In cases where this step identified a disagreement between members of the research team, each investigator reread the original transcript, discussed the coding, and a consensus was reached.

Results

Analysis identified 65 lower order themes that were grouped into 24 codified units. The units were subsequently grouped into 12 mid-order themes. These were collated into four higher-order themes and contextualised in a single setting as identified in Table 4 and represented in a thematic map presented as Figure 1. In line with Braun and Clarke (2006), we have provided examples of the themes from the data samples and have used a variety of quotes to demonstrate the depth and richness found in the data. The adventure sports coaches have remained confidential and the session locations and students have been dis-identified to ensure anonymity. The planning process focuses on the collection of data and the audit of that data, via a resource audit, and an audit of the professional judgement and decision making process (via a pedagogic and decision making audit). These audits are considered in synergy with and reflect the epistemological values of the coaches as highlighted in Collins et al. (2013).

Discussion

Results suggest that information is collected, but not immediately utilised, in a distinct three-part process: a logistical, pedagogic, and decision-making audit.

The Resource Audit

The Resource Audit is non-time pressured and pragmatic in nature. While this takes place in direct relation to the proposed session, it can be discrete from the session in question and form part of the macro plan. The physical resources available, such as equipment, transport, environmental conditions, and staff are checked for availability and suitability. Implicit within this audit is the duration and context of the coaching interaction (e.g., within a week long course or a three year undergraduate program). This leads to preparation of recourses in some cases and also identifies the constraints posed by the logistic situation. This can be summarised as, “What do I have available and when?” (Coach 1). The resource audit

addresses two, apparently contradictory, elements in the planning process in order to reduce the decisions required in the field and to provide a number of workable options that can be operationalized, namely the “best fit” options with the “tools at hand” (Coach 4).

The Pedagogic Audit

The Pedagogic Audit focuses on the individuals within the group, their motivations, desired outcome and learning needs. This audit identifies and verifies the potential start point for the coaching process with each individual within the group. The individualized aspect of the audit achieves two purposes: Rapport development between coach and individual and identification of the individual’s pedagogic needs. The pedagogic audit pays attention to the individual’s perception of its own requirements. This is articulated as a “needs versus wants” balance (Coach 1). The aforementioned start point for the coaching process is aligned with options regarding the pedagogic approaches that may be most productive with a given individual at that point.

The Decision Making Audit

An initial decision is made regarding possible venues and locations by combining the logistic and pedagogic audit. Coach 1 comments, “I’d definitely anticipate this [using the wind and trim] sort of opportunities for the lesson” while Coach 2 states, “I had fairly clear idea of what we would find when we got here.” This leads to the identification of a range of possible locations, the plan A, B, or C scenario. The adventure sports coach initially makes a deliberate choice of a venue offering a range of locations and contexts to enable them to address the students’ pedagogic needs. This is articulated by Coach 2 who goes further than his or her preceding statement by stating, “I’ve also chosen a place with the idea that we may well have to differentiate what we’re doing between the students.” A multi-function venue allows the coach to respond to student needs as the session evolves and also accommodate the varied rates of the development and changes in demand that occur as a result of the

individualised process. Coach 3 highlights the need for verification on the decisions made regarding ability and skill of students requiring direct observation of the students in context:

With adventure sports there is very little planning, to a certain extent. There's planning for, I know, I know roughly what I'm getting because there's booking forms and the type of course they've booked up and I'll pay a bit of attention to that but not loads until I see it.

This information gathering process (observation and questioning) and the meta process of the decision making audit draws together the resource and pedagogic audit. Coach 5 comments, "I'm constantly analysing... have I pitched it right" and "I'm constantly reflecting." Coach 5 further explains, "If I arrive at the beach before my session has even started, I could have made the wrong decision by just being on that beach." Coach 2 explains his approach on arrival at the venue while standing with the group overlooking the possible venue for the days coaching, "I wanted to check that Lizzie and Helen were happy with the prospect of coming over to the windier side of the island."

Having identified the learning needs of the individual, the adventure sports coach focuses on selecting and pitching the level of the learning environment. The impact of environment on the learning potential and a need to "get it right" is summarised by Coach 1 who refers to the physical activity and pedagogic activity, "You can twiddle your paddle all you want but if you don't know the environment you're in for a beating": a view supported by Coach 5 who articulates the impact on the students directly, "I think that the fact that the environment plays such a huge part on people's, I suppose arousal or... no its not arousal; it's a bit too specific...on their motivation to be there..."

On arrival at the venue, the adventure sports coach examines the suitability of the decision at this point. A cyclical process, collect information, action, and audit, forms the basis for the flexible and adaptive plan that is required to be able to respond to changes in

skill level, performance, and the environment itself. The adventure sports coach observes the preparation and behaviour of the performers in an unstructured manner, contrasting the behaviour of the student with that anticipated by the adventure sports coach. Clearly having committed to a course of action, the adventure sports coach exposes himself or herself to heuristic traps as outlined by Ball and Ball-King (2011) and the resultant decision to shift venue has both logistic and credibility impact on the rapport between adventure sports coach and the group, “Its all in the venue choice.” A further audit cycle confirms, via a process of direct observation and questioning in context, the suitability of the venue to achieve the pedagogic needs. The adventure sports coach elects the best-fit option to address the individual’s and group’s needs (this may necessitate a change in venue, though this was not observed) if the pedagogic or safety needs cannot be met. The auditing process can be surmised as a risk versus benefit decision (Collins & Collins, 2013)

The Plan

The auditing process leads to a sub optimal, best fit, skeletal plan in which the start point is established and an ideal end point identified. The route between start and finish being a loose framework that allows the adventure sports coach flexibility and adaptability in the dynamic coaching environment. These plans are characteristically conservative both in duration and extent, appearing to evolve as the environment and learner develop. Coach 4 described this, “...I haven’t got an absolute plan this-this- this-this its... I’ve got a range of options that I want to cover. I want to keep it holistic and we’ll see how it develops.” Coach 2 explained that the plan extends to lunch at which point the plan will be adjusted depending on the student and environment development. The interpretation of the rate and direction of evolution relies on the experience of the adventure sports coach and is an intuitive process with all the coaches in the study looking for the “right” moment to move on. The adventure sports coach anticipates the need to generate variation in practice by varying task, technique,

and environment in response to the stage of learning of the individual and a risk benefit decision based on observation in that context.

Achieving Alignment in an Uncertain World

Collins and Collins (2013) cite Lyle and Cushion (2010) and Martin, Cashel, Wagstaff and Breunig (2006) as suggesting that the collection of information is fundamental in coach decision making. Observation and questioning, pre action, collects the information that enables the coach to identify the start point and potential end point of the coaching interaction (needs v's wants). The same processes, observation and question, in action, facilitates auditing of this initial information gathering and continues as an ongoing check and challenge (audit) throughout the adventure sports coaching interaction. While observation and questioning are explicit in the resource audit it appears more tacit in nature within the pedagogic auditing processes, the later appearing to be a more intuitive process that the coaches struggled to articulate. Within the decision making audit, including the meta aspects of the process, some elements (e.g. a change of task or environment) can be easily justified and explained. However the meta process appears more tacit in nature, we speculate may reflect a relationship with the pedagogic audit. However, all three audits do act as parallel agendas or nested thinking (Abraham & Collins, 2011) with in the overall coaching process. These parallel related agendas relate to a synergetic risk and pedagogic management within the overall coaching process that reflect the risk verses benefit decision noted by Collins and Collins(2013). These decisions accommodate the immediate challenges, such as risk and immediate learning needs, but also reflect the longer-term philosophical agendas such as the development of a skillful independent performance and in this regard reflect the epistemological chain identified by Collins, Collins and Grecic (2014). Alignment of the short-term with philosophical aims is a flexible and adaptable pathway that appears intuitive and draws on the experience of the coach. Such "gut feel" decision-making has a long

tradition in coaching (cf. Nash & Collins, 2006) and even more overtly in the case of the adventure sports coach and perhaps illustrate an ontological aspect to the process that is worthy of further investigation. The adventure sports coach intuitive drives have evolved from somewhere and almost by definition, therefore, must at some earlier stage have been conscious and rationalized.

While the nature and value of intuitive decision-making (c.f. Effken, 2001; English, 1993; Thomson & Dowding, 2002) will remain a discussion point. Intuitive decisions appears to align with heuristic approaches to decision making, as advocated by Breakwell (2007) and McCammon (2004). The frequency of self-reported, “feel right” decisions and the linear algorithmic decisions in the pre-planning process would align the professional judgement and decision making process with the dual processes proposed by Stanovich and West (2000) and nested processes (Abrahams & Collins, 2011) in which decision making may have synergetic emotive and logical parts.

The weaknesses of these intuitive approaches as part of in-field planning are clearly outlined by McCammon (2004), Galloway (2005) and Stamba (2005), yet appear tempered by the decision making audit as a meta process that is characteristic of the high level adventure sports coach in practice. This meta process in which a refocusing of professional judgment and decision making constantly interplays with the dynamic environment requires the adventure sports coach to understand the context of the process and to be able to adapt to it. (Collins, Carson and Collins, in review)

Integration of professional judgement and decision making into the Coaching Process

Individualised practices characterise high-level coaching and teaching. This intention to individualise creates a high cognitive load on the coach. Consequently the coach manages this cognitive load by reducing the ‘span of control’ (Collins and Collins, 2014) that they face by utilising a range of pedagogic and practical strategies. These strategies are identified and

applied as a product of the auditing process. The high-level adventure sports coach integrates the impact of the environment on performance, the potential development, and their own capacity to differentiated practice. The adventure sports coach uses a range of strategies that enable the integration of the professional judgement and decision making into the practicalities of the coaching process. Collins and Collins, 2014 identify that this is both a considered act on the adventure sports coach's part and an opportunist occurrence. The adventure sports coach uses a range of pedagogic resources to individualise and differentiate in this environment (Collins & Collins, 2014).

Conclusion

The high-level adventure sports coaches in this study employ an evolving planning process in which pre-, in- and on-action planning form part of a continually audited cycle. The focal point of the cycle is the learning needs of the individual student. This reflects the epistemological underpinning to adventure sports coaching practice highlighted by Collins et al. (2013) and confirms the epistemological chain through the adventure sports coach process.

In response to the highly dynamic environment, the individual learner and the unique interaction between the learner and environment, the adventure sports coach retains a flexible adaptive and creative approach to planning and delivering the pathway between the current individual's performance and the desired independent, skilful performance. Aligning the epistemological positions of the coach with the aspiration of the learning requires the coach to have pedagogic and practical skills and sufficient cognitive capacity to manage the 'span of control' in that required session. The facilitating mechanism is a refined professional judgement and decision making process that has a distinct meta process associated with its enactment. This requires a refined cycle of plan audit, do, audit, and a willingness and ability to respond and adapt to the changing needs of the student and the environment and the skills to individualise and differentiate practice.

References

- Abraham, A., & Collins, D. (2011). Taking the next step: ways forwards for coaching science. *Quest*, 63(4), 366-384. <http://dx.doi.org/10.1080/00336297.2011.10483687>
- Aronson, J. (1994). A pragmatic view of thematic analysis. *The Qualitative Report*, 2(1), 1-3. Retrieved from <http://www.nova.edu/ssss/QR/BackIssues/QR2-1/aronson.html>
- Ball, D., & Ball-King, L. (2013). Safety management and public places: Restoring balance. *Risk Analysis*, 3(5), 763-771. doi:10.1111/j.1539-6924.2012.01900.x
- Bannigan, K., & Morres, A. (2009). A model of professional thinking: Integrating reflective practice and evidence based practice. *Canadian Journal of Occupational Therapy*, 76(5), 342-350. Retrieved from <http://cjo.sagepub.com>
- Boyatzis, R. E. (1998). *Transforming qualitative information: Thematic analysis and code development*. Thousand Oaks, CA: Sage.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <http://dx.doi.org/10.1191/1478088706qp063oa>
- Breakwell, G. M. (2007). *The Psychology of Risk*. Cambridge: Cambridge University Press.
- Cain, K. D., & McAvoy, L. H. (1990). Experience based judgement. In J. C. Miles & S. Priest (Eds.), *Adventure education* (pp. 241-250). State College, PA: Venture Publishing.
- Cleermans, A., & Jimenez, L. (2002). Implicit learning and consciousness: A graded, dynamical perspective. In R. M. French & A. Cleeremans (Eds.), *Implicit learning and consciousness: An empirical, philosophical and computational consensus in the making* (pp. 1-40). Hove, UK: Psychology Press.
- Cohen, L., & Manion, L. (1994). *Research methods in education* (4th ed.). London, UK: Routledge.
- Collins, L., & Collins, D. (2012). Contextualising the Adventure Sport Coach. *Journal of*

Adventure Education and Outdoor Learning, 12(1), 81-93.

doi:10.1080/14729679.2011.611283

Collins, L., & Collins, D. (2013). Decision-making and risk management in Adventure Sports Coaching. *Quest*, 65(1), 72-82. doi:10.1080/00336297.2012.727373

Collins, L., Collins, D., & Grecic, D. (2013). *The epistemological chain in high level Adventure Sports Coaches*. Manuscript submitted for publication.

Collins, L., & Collins, D. (2014). Integration of In-Action Reflective Practice as a Component of Professional Judgment and Decision Making in High Level Adventure Sports Coaching Practice. *Journal of Sports Science*.

doi.org/10.1080/02640414.2014.953980

Crabtree, B. F., & Miller, W. L. (1999). Using codes and code manuals: A template organizing style of interpretation. In B. F. Crabtree and W. L. Miller (Eds.), *Doing qualitative research* (2nd ed., pp. 163-177). Newbury Park, CA: Sage.

Cross, N. (1999). Individualization of training programmes. In N. Cross and J. Lyle (Eds.), *The coaching process: Principles and practice for sport* (pp. 174-191). Oxford, UK: Butterworth Heinemann.

Donaghy, M. E., & Morss, K. (2000). Guided reflection: A framework to facilitate and assess reflective practice within the discipline of physiotherapy. *Physiotherapy Theory and Practice*, 16(1); 3-14. doi:10.1080/095939800307566

Drury, J., Bonney, B., Berman, D., & Wagstaff (2005). *The back country classroom: Lesson plans for teaching in the wilderness* (2nd ed.). Guilford, CY: The Globe Pequot press.

Effken, J. A. (2001). Nursing theory and concept development and analysis. *Journal of Advanced Nursing*. 34(2), 246-260. doi:10.1046/j.1365-2648.2001.01751.x

English, I. (1993). Intuition as a function of the expert nurse: A critique of Benner's novice to expert model. *Journal of Advanced Nursing*, 18(3), 387-393. doi:10.1046/j.1365-

2648.1993.18030387.x

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development.

International Journal of Qualitative Methods, 5(1), 80-92. Retrieved from

http://www.ualberta.ca/~iiqm/backissues/5_1/html/fereday.htm

Galloway, S. (2005). Judgment and decision-making in outdoor leadership: Critical factors, common mis-steps, and keys to success. *Proceedings of the 2005 National Conference on Outdoor Leadership*.

Galloway, S. (2007). Experience and medical decision making in outdoor leaders. *Journal of Experiential Education*, 30(2), 99-116. doi:10.1177/105382590703000202.

Lyle, J., & Cushion, C. (2010). *Sports coaching: Professionalization and Practice*. London, UK: Churchill Livingstone.

Lyle, J. (2003). Stimulated recall: A report on its use in naturalistic research. *British Educational Research Journal*, 29(6), 861-878. doi:10.1080/0141192032000137349

Martin, B., Cashel, C., Wagstaff, M., & Breunig, M., (2006). *Outdoor Leadership. Theory and Practice*. Champaign, IL: Human Kinetics.

Martindale, A., & Collins, D. (2010). But why does what works work? A response to Fifer, Henschen, Gould, and Ravizza. *The Sport Psychologist*, 24(1), 113-116. Retrieved from <http://journals.humankinetics.com/>

McCammon, I. (2004). Heuristic traps in recreational avalanche accidents: Evidence and implications. *Avalanche News*, 68(1), 1-10. Retrieved from <http://avtrainingadmin.org/pubs/McCammonHTraps.pdf>

Miles, M. B., & Huberman, A. M. (1994). *Qualitative data analysis* (2nd ed.). London, UK: Sage.

Militello, L. G., & Hutton R. J. (1998). Applied cognitive task analysis (ACTA): A

- practitioner's toolkit for understanding cognitive task demands. *Ergonomics*, *41*, 1618-1641. doi:10.1080/001401398186108
- Moshman, D. (2000). Diversity in reasoning and rationality: Meta cognitive and developmental considerations. *Behavioural & Brain Science*, *23*, 689-690.
<http://dx.doi.org/10.1017/S0140525X00483433>
- Muir, T., & Beswick, K. (2007). Stimulating Reflection on practice: Using the supportive classroom reflection process. *Mathematics Teacher Education and Development*, *8*, 74-93. Retrieved from <http://www.merga.net.au/node/42>
- Muir, T. (2010). Using Video stimulated recall as a tool for reflecting on the teaching of mathematics. In L. Sparrow, B. Kissane, & C. Hurst (Eds.), *Shaping the future of mathematics education: Proceedings of the 33rd annual conference of the Mathematics Education Research Group of Australasia* (pp. 438-445). Fremantle, UK: MERGA.
- Nash, C., & Collins, D. (2006). Tacit knowledge in expert coaching: Science or art? *Quest*, *58*(4), 465-477. doi:10.1080/00336297.2006.10491894
- Priest, S., & Gass, M. A. (2005). *Effective leadership in adventure programming* (2nd ed.) Champaign, IL: Human Kinetics.
- Sloman, S. A. (1996). The empirical case for two systems of reasoning. *Psychological Bulletin*, *119*(1), 3-22. doi:10.1037/0033-2909.119.1.3
- Smith, J. A., & Osbourne, M. (2008). Interpretive phenomenological analysis. In J. A. Smith (Ed.), *Qualitative psychology, a practice guide to research methods* (2nd ed., 51-80). London, UK: Sage.
- Smith, J. A., Flowers, P., & Larkin, M. (2012). *Interpretative phenomenological analysis: Theory, method and research*. London, UK: Sage.

Smith, J. A. (2011). Evaluating the contribution of interpretive phenomenological analysis.

Health and Psychology Review, 5(1), 9-27. doi:10.1080/17437199.2010.510659

Sparkes, A. (1998). Validity in qualitative inquiry and the problem of criteria: Implications

for sport psychology. *The Sport Psychologist*, 12(4), 363-386. Retrieved from

<http://journals.humankinetics.com/tsp>

Stanovich, K. E., & West, R. F. (2000). Individual differences in reasoning: Implications for

the rationality debate. *Behavioural & Brain Sciences*, 23(5), 645-665.

<http://dx.doi.org/10.1017/S0140525X00003435>

Stemba, B. (2005). Traps and tips of decision making for outdoor leaders. *Proceedings of the*

2005 national conference on Outdoor Leadership.

Thompson, C., & Dowding, D. (2002). *Decision making and judgment in nursing: An*

introduction. London, UK: Churchill Livingstone.

Loel Collins