



# Measuring decision expertise in commercial ski guiding in a more meaningful way



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## ARTICLE INFO

### Article history:

Received 16 March 2015

Received in revised form

12 August 2015

Accepted 26 November 2015

### Keywords:

Expertise

Experience

Situational awareness

Decision-making

Intuition

Analysis

## ABSTRACT

The development of ski guide decision expertise is situated within an environmental context influenced by massive consequence and feedback ambiguity. Typically, the quality of the decision process is described as being contingent on the evolved expertise of the decision maker. The central problem is that the development of decision expertise is dependent on feedback that often lacks clarity, particularly when nothing goes wrong. While there are methods for estimating expertise, it cannot be measured directly. The number of years of experience is often used, but it is an inadequate measure, as it does not necessarily correlate with increased decision competency. To address this issue, I propose a new measure that incorporates both depth and breadth of experiences to provide a more complete picture of expertise development. The approach is illustrated with a small sample of professional ski guides from Canada.

## MANAGEMENT IMPLICATIONS

The article provides a new approach to measure decision making competence of ski guides. The findings are relevant for the risk management through decision training, the development of new training events, the evaluation of the decision expertise of front line staff.

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## 1. Introduction

Commercial ski guiding is the activity of providing a high quality skiing experience to paying clients in uncontrolled mountainous terrain. While there are many facets to this profession, the central responsibility of the guide is to provide a high quality experience while keeping the group's physical risk from avalanches and other natural hazard within an acceptable risk band (Purdy, 2010). The risk can be managed through careful terrain selection and/or an estimation of the likelihood of an avalanche, all the while moderated by the potential consequence (Statham, 2008). In most countries, the national mountain guide association oversees the training and certification of commercial ski guides. To effectively assess prospective candidates for ski guide certification or evaluate the expertise of seasoned guides it is necessary to have an objective method for accurately assessing their decision expertise.

Existing studies on ski guide decision-making have used measurements of experience (i.e., years of experience) and, or certification (Adams, 2005; Grímsdóttir, 2004) to assess the level of expertise of their study participants. The primary advantage of

using these two simple measures is that they are typically well documented. The exam component of the certification process measures decision competency (Canadian Mountain and Ski Guide Program, 2015). Levels of members' current certification are listed in the membership section of the websites of the Association of Canadian Mountain Guides and the Canadian Ski Guides Association. However, there are considerable limitations in using these measures to estimate decision-making expertise in ski guiding. The certification process demands a certain level of proficiency to be successful, but the weeklong examination encapsulates only a snapshot of candidates' decision competency. Using recorded years of experience also has limitations, as it does not include any measure of increased competence. It is only indicative of longevity in the decision environment. Furthermore, these measures do not account for the role that deliberate practice takes in the development of decision expertise (Ward, Hodges, Starkes, & Williams, 2007).

As expertise cannot be directly measured, it must be calculated based on a variety of indicators (Shanteau, Weiss, Thomas, & Pounds, 2002). The accuracy of the calculation depends both on the relevance of the chosen indicators and the accuracy of the available records. Existing studies in other professions have generated a variety of criteria to calculate or estimate expertise, with no definitive method gaining wide acceptance (Ericsson &

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Charness, 1994; Ericsson, 1996; Galloway, 2005, 2007; Patel, Kaufman, Magder, & Ericsson, 1996; Starkes & Ericsson, 2003). One of the main challenges has been to extract enough high quality parameters to generate a good picture of expertise. Most researchers of deliberate practice have depended on self-reported retrospective accounts of the frequency, type and duration of practice sessions. Unfortunately even diaries have not proved to be consistently accurate reflections of how practices have been structured (Ericsson & Charness, 1994; McEleney & Byrne, 2006).

What is needed in the ski guiding community is a more accurate way of calculating, or estimating decision-making expertise. The benefit to this is that unique training events can be created for each level of expertise that utilize participants' existing competencies and push them to higher levels. The intent of this paper is to propose a new approach for measuring ski guiding decision expertise that offers a more comprehensive and meaningful perspective. The proposed approach is based on a literature review, which examines critical characteristics of the decision environment of professional ski guides and identifies central components necessary to assess their decision expertise more comprehensively. A small sample of mountain and ski guides was surveyed to illustrate and explore the proposed approach.

## 2. Literature Review

### 2.1. Decision-making

A conceptual understanding of the fundamental elements that contribute to the decision-making process is central to the development of a meaningful measurement of expertise. Although there is some debate within the judgment and decision-making literature, it is generally accepted that decision-making includes two systems or processes, one analytical and one intuitive (Barrouillet, 2011; Kahneman & Tversky, 1973; Sloman, 1996). This is supported by functional magnetic resonance imaging scans, which have indicated that different parts of the brain are activated when participants respond analytically as opposed to intuitively (Lieberman, Jarcho, & Satpute, 2004).

A model that has been used to describe advanced decision-making in ski guiding is Recognition-Primed Decision-Making (RPD) (Adams, 2005; Klein, 1998; McCammon, 2001). RPD is based on the assumption that recognition is the initial step in the decision process (Klein, 1998). There are two components to recognition; the need for a decision must be recognized first. This primes the second component, which is recognition of the decision environment. This central theme of recognition in RPD is based on the concept of situational awareness (SA), which has been described as the ability to maintain the big picture (Endsley, 1997). The correct identification of the situational context and decision clues can lead to effective decision-making. This is different from a decision error that results from a poorly understood decision context. Experts can typically make rapid decisions based on situational awareness and pattern recognition (Klein, 2011).

### 2.2. Expertise and its development

The expertise literature crosses many fields and areas of study. It is well developed, with studies ranging from doctors (Patel et al., 1996), to sports (Ollis, Macpherson, & Collins, 2006; Starkes & Ericsson, 2003), to nursing (Benner, 1984; Rolfe, 1997), and even fire-fighters and guided missile ship commanders (Klein, 1993). It has been identified and generally accepted that experts make decisions differently from beginners (Atkins & McCammon, 2004; Benner, 1984; Galloway, 2002; Morrow et al., 2003; Starkes & Ericsson, 2003). A key transitional point for a decision maker is

when an understanding develops that as a competent practitioner one has the potential to continue one's development into the realm of an 'expert' (Benner, 1984). At this stage, heightened sensitivity to incompetence may overshadow recognition of growing expertise. Anxiety rooted in fear of failure is indicative of a more sophisticated grasp of the extent of their naïveté. Knowing what you do not know is a hallmark of expertise. Experts typically put more time into the analysis of a problem prior to initiating action and subsequently need less time to solve it. They can also quickly absorb more information and remember it in both the short and long-term (Wagner & Sternberg, 2002). Various authors (Benner, 1984; H. L. Dreyfus & Dreyfus, 2005; S. E. Dreyfus, 2004; Ericsson & Charness, 1994) identified stages of mastery, or levels of expertise, which relate to how efficiently a complex situation might be resolved.

The works of Ericsson benchmark the study of expertise. Ericsson, Krampe, and Tesch-Romer (1993) analysed the diaries of high level musicians and concluded that experts committed to roughly 10,000 hours of deliberate practice, typically over a 10 year period. This notion was supported by studies on chess players (Charness, Krampe, Mayr, & Ericsson, 1996), in medicine (Patel et al., 1996) and on athletes (wrestlers, skater and golfers) (Starkes et al., 1996). It is notable that even extraordinarily talented individuals like chess master Bobby Fischer needed nine years of preparation before he was at an internationally acclaimed level (Ericsson et al., 1993).

A critical distinction is to recognize that ten years of experience without deliberate practice will not lead to expertise (Campitelli & Gobet, 2011). Experience can be thought of as 'what happened', while expertise is based on the learning that evolves out of experiences. A full experience maximizes the learning potential inherent within a given situation. Weick and Sutcliffe (2007) describe the lack of learning associated with empty experiences as the repetition of similar events with little in the way of challenge or reflection.

It is also necessary to consider the impact of variation within deliberate practice on the development of expertise (Tozer, Fazey, & Fazey, 2007). In the case of ski guiding, this can be achieved by working multiple locations or environments with distinct avalanche hazard characteristics. It is possible that expertise develops differently for guides who move from one operational area to another, particularly when approached in a deliberate and strategic manner. Being challenged to make difficult decisions on a more regular basis, compared to a guide who continues to work in the same location and subsequently has developed a greater depth of local knowledge, may in the end foster a more sophisticated inventory of patterns and a more adaptive decision process (Tozer et al., 2007). There are degrees of variation within this premise, however, as two neighbouring areas will be more alike than two distant operations. Of note is that one of the requirements for entry into the training and certification stream for ACMG guides is the development of decision competence in a variety of mountain environments.

A number of conditions have been cited as being characteristic of events that foster the development of expertise. These included: a desire and motivation to improve, a well designed task that accommodates the learner's starting point, and timely access to high quality feedback (Ericsson et al., 1993). The greatest potential for development occurs when tasks that meet these criteria are repeated often. Of these characteristics, high quality feedback, whether generated externally or internally through a reflective process, was generally considered the most important aspect (Balzer, Doherty, & O'Connor, 1989; Brown, 2006; Hogarth, Gibbs, McKenzie, & Marquis, 1991). A well-designed task performed by a highly motivated person in an environment without high-quality feedback has limited power for the development of expertise

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