

Institution: University of Stirling		
Unit of Assessment: 30. Philosophy		
Title of case study: Philosophical insights to improve outdoor sports decision-making, education, and practice.		
Period when the underpinning research was undertaken: 2013-2020		
Details of staff conducting the underpinning research from the submitting unit:		
Name(s):	Role(s) (e.g. job title):	Period(s) employed by submitting HEI:
Dr Philip A. Ebert	Senior Lecturer	2007-Present
Period when the claimed impact occurred: 2013-2020		
Is this case study continued from a case study submitted in 2014? No		
1. Summary of the impact		
<p>Over the last 10 years, there have been 25 avalanche fatalities involving skiers and mountaineers in Scotland. Every year, there are ~250 such fatalities worldwide with many more injured. Human factors in decision-making play a crucial role in avalanche accidents and roughly half the groups involved in avalanche accidents involve leaders with formal avalanche training. Philip Ebert's research has helped to improve mountain safety by changing practitioners', professionals', and educators' understanding of decision-making in avalanche terrain, and directly influenced best practice of educators and professionals in the UK and the USA. He acts as an academic advisor and research partner for the Scottish Avalanche Information Service, improving risk communication and embedding understanding of risk into best practice.</p>		
2. Underpinning research		
<p>Philip Ebert's research focuses on epistemology (risk & rationality) and on the philosophy of logic and reasoning. He works both on <i>theoretical</i> topics regarding ideal rationality, i.e. normative theories of how humans <i>ought</i> to reason and act, and on <i>experimental</i> topics, i.e. descriptive theories of how humans <i>do actually</i> reason and act. Since January 2018, Ebert has been a member of the Behavioural Science Centre (Stirling) collaborating with behavioural economists and psychologists on <i>behavioural</i> topics, i.e. how and when behavioural interventions can improve an individuals' decision-making and whether their use is ethically justified.</p> <p>Ebert's experience as an academic expert on decision-making under risk and as an outdoor sport professional (Ebert is a qualified summer mountain leader & a qualified backcountry ski leader with more than 30 years of personal experience) places him in an ideal position to pursue new academic research on <i>epistemic and behavioural issues in an outdoor sports decision-making context</i>. The specific research theme was "triggered" by Ebert's involvement in an avalanche incident in 2012.</p> <p>A core aim of Ebert's research is to apply Bayesian reasoning – reasoning typified by an <i>ideal</i> reasoner – to avalanche decision-making. R6 and R4 highlight the relevance of Bayesian reasoning when a subject assesses their own competencies as decision-maker. R3, R4, and R6 raise awareness of the "wicked" nature of the outdoor learning-environment, where a good outcome is not a reliable indicator of the quality of the underlying decision. Given this unusual learning environment, decision-making can easily lead to an <i>overconfidence</i> bias which, in turn, can affect an individual's risk attitude. Moreover, R6 highlights the important issue of the <i>cumulative</i> aspect of risk and the effects of competence in reducing such long-term risks in particular for younger recreationists. In R3, Ebert uses Bayes' theorem to assess the informativeness (i.e. the positive predictive value) of specific slope stability tests widely used by mountain guides and professional forecasters. In addition, he highlights the relevance of the base rate fallacy when interpreting such test results and identifies three core Bayesian lessons for decision-making in avalanche terrain. R3 inspired researchers from the world-leading Institute for Snow and Avalanche Research at Davos, Switzerland to test and corroborate Ebert's three theoretical lessons using actual observations (Techel et. al. 2020, section 5.3).</p>		

Ebert's research in avalanche decision-making is grounded in his wider expertise in theoretical issues in epistemology and his experimental work. Ebert's most recent work, **R1** and **R2**, focuses on normative, behavioural, and descriptive issues in human risk judgements. It identifies a number of different possible determinants of how people make risk judgements and how this can affect human action. More specifically, **R2** introduces and defends a form of risk pluralism which offers a new way to interpret existing debates about the *rationality* of human risk judgement. **R1** and **R2** are informed by Ebert's earlier philosophical work, **R5**, which highlights important *ethical* and *behavioural* dimensions with regards to "gratuitous" risk-taking and discusses ways in which such risk-taking can be justified. It is worth noting that Ebert's impact engagement has, in turn, influenced his own academic research agenda: For example, **R1**, which comprises an experimental survey study on danger and recklessness judgements about outdoor sports participants, is directly influenced by conversations with practitioners.

3. References to the research

- R1.** Ebert, P.A. and Durbach, I. (2020) "Gratuitous Risk: perceived danger and recklessness judgements about outdoor sports participants," *PsychArchives*.
<http://dx.doi.org/10.23668/psycharchives.4368> [Experimental study supported by Royal Society of Edinburgh **F2** on perceived danger judgements which connects to **R2**.]
- R2.** Ebert, P.A. Smith, M., Durbach, I. (2020). "Varieties of Risk", *Philosophy and Phenomenological Research*, 101(2): 432-455. <https://doi.org/10.1111/phpr.12598>
 [Top 10% most downloaded papers in the last 12 months at this top 5 philosophy journal]
- R3.** Ebert, P.A. (2019). "Bayesian Reasoning in Avalanche Terrain", *Journal for Adventure and Outdoor Education*, 19(1): 84-95. <https://doi.org/10.1080/14729679.2018.1508356>
 [1700+ downloads with wide dissemination amongst educators]
- R4.** Ebert, P.A. (2015). "Know your competence. Reflecting on competent decision-making in avalanche terrain", *The Avalanche Review*, 33(4):22-23.
<http://hdl.handle.net/1893/28310> (open access)
 [Paper published in the journal of the *American Avalanche Association* who provide curricula for avalanche education. The journal is widely read by outdoor professionals. The paper is cited in the classic textbook for avalanche decision-making by Bruce Tremper.]
- R5.** Ebert, P.A. and Robertson, S. (2013). "A Plea for Risk", *Royal Institute of Philosophy Supplement*, 73:45-64.
<http://hdl.handle.net/1893/16005> (open access)
 [Shortened German translation: "[Riskant]—[Trotzdem]—[Wegen]: Ein Plädoyer für das Risiko im Bergsport" in *Alpenvereinsjahrbuch BERG 2014*, 138:196-202 published by the Deutscher, Österreichischer, Südtiroler Alpenverein. (~20,000 copies sold)]
 [The paper informs the documentary *Comfort Zones* and contains an early discussion of the relevance of behavioural insights for outdoor sport practitioners.]
- R6.** Ebert, P.A. and Photopoulou T. (2013). "Bayes' beacon: avalanche prediction, competence and evidence for competence. Modelling the effect of competent and incompetent predictions of highly improbable events". In: *Proceedings of the International Snow Science Workshop (ISSW)*, Grenoble, France, pp. 363-70. <http://arc.lib.montana.edu/snow-science/item/1817> [This paper is also cited in Tremper's textbook (2018 edition).]

Funding related to this impact case study (TOTAL: ~GBP 787,829 FEC):

- F1.** AHRC Standard Research Grants (Ebert, PI: GBP 785,405 FEC, AH/T002638/1) entitled "[Varieties of Risk](#)" awarded in December 2019 running over a period of 30 months. The project has a distinctive *impact* phase and involves collaboration with members of the [Glenmore Lodge National Training Centre](#). We investigate how theoretical and experimental insights gained about risk and danger judgements can be applied in an outdoor sports context. The project also supports a collaborative research project with the Coordinator of

SAIS ([Scottish Avalanche Information Service](#)), Mark Diggins, to improve risk communication and risk understanding of winter sport enthusiasts.

F2. Royal Society of Edinburgh Small Grant (Ebert, PI: GBP 2,424 FEC) entitled “Biases in outdoor sport risk judgements” awarded in December 2018. Travel support to engage with impact stakeholders at Glenmore Lodge National Training (Aviemore) and collaborate with members of the *Centre for Avalanche Research and Education* (CARE) at Tromsø (Norway), as well as provide the necessary funding to pursue for **R1**.

4. Details of the impact

1) Ebert influenced avalanche education and contributed to continuing personal and professional development of mountain guides and outdoor sports educators.

Ebert presented his research on avalanche terrain as a “wicked” learning environment with its many surprising consequences (**R3, R4, R6**) at International Snow Science Workshops (~1000 attendees from academia, professional organisations, and practitioners), and at smaller workshops in France, Norway and Scotland from 2013-2020. His work has been cited in the most widely used textbook in avalanche education in the English-speaking world by Bruce Tremper, former director of the Utah Avalanche Center and coordinator for avalanche safety at the 2002 Olympic Games at Salt Lake City. As Tremper states:

“Philip Ebert’s research and publications have helped to inform the community of avalanche researchers, avalanche educators and avalanche forecasters. For instance, I referenced two of his papers in the recent 3rd Edition of my book, *Staying Alive in Avalanche Terrain*, which is used to teach most avalanche classes. First, his research showed that, statistically, avalanche education has a benefit but probably less so than what many would hope, and second, to make the point that snow stability tests are much more informative during times of unstable snow than during times of stable snow.” (**T1**)

Since 2018, Ebert has worked closely with educators at Glenmore Lodge, the National Outdoor Training Centre in Aviemore, which provides education and assessment for outdoor qualifications (such as mountaineering, climbing and ski leader courses) and offers outdoor education courses to non-professionals. In addition, Ebert presented his work (**R3, R4, R6**) at professional development workshops at Glenmore Lodge including the [largest CPD](#) event in the UK for outdoor instructors (**T2**, 100 participants) and at general audience talks (March 2019, 30 participants). Ebert’s work is regarded as having wide-ranging applications for mountain sports generally, as Alan Halewood, a qualified assessor for the highest UK-based mountaineering qualifications writes: Ebert’s work has “informed and provided academic underpinning for my own practice as a professional Mountaineering Instructor” – in particular when “training the trainers” (Alan Halewood, **T2**). Additionally, “the concepts Phil has illuminated are passed to a wide range of Instructors, Climbers, Leaders, Leisure Managers and Coaches on an ongoing basis and both inform and provide credibility to the nature of my own practice and the genesis of that of others” (**T2**). As Technical Advisor for the NICAS – UK’s youth climbing scheme, which has engaged 200,000 young people to date – Halewood is now bringing these insights to the next generation of outdoor sports practitioners and instructors.

2) Ebert influenced and provided feedback on the avalanche training curriculum for Mountain Guide Training, and influenced best practice.

Ebert’s research has influenced the content of the [International Federation of Mountain Guides Associations](#)-certified British Mountain Guides (BMG) training programme – a qualification that leads to the highest qualification in the world for leading people in the mountains and the only UK qualification valid abroad for climbing and skiing off-piste on glacial terrain. Ebert provided feedback and wrote lecture material for the current curriculum (**T3**) and has been invited to present his research at training events focusing on decision-making and human factors. As Bruce Goodlad, former Technical Director of BMG writes: Ebert’s research had a “positive effect on professional standards of mountain guide training”. In particular, **R3** has “contributed to

understanding the theoretical intricacies of stability tests and contributed to the debate about their usefulness” (T3). Moreover, Ebert’s “work on the wicked learning environment and group decision making has had a strong influence on the way we structure our public avalanche courses” (T3), which are run by Goodlad’s partner company Avalanche Geeks and in Goodlad’s role as the Alpine Safety Advisor to the Ski Club of Great Britain (reaching around 200 people each winter).

3) Ebert influences research themes and communication strategies of national organisations and provides expert advice.

The Snow and Avalanche Foundation of Scotland (SAFOS) brings together experts in the fields of forecasting, education, and research, and is the leading body of its kind in the UK. Recognising the need for theoretical and behavioural research in human decision-making, SAFOS made Ebert the first academic philosopher to be a voting member on its board (in January 2019). Ebert provides academic expertise with a focus on education and risk communication (T4). In particular, together with Dr Jane Blackford (Edinburgh, Engineering), Derek Bain, and Ian Sherrington (both Glenmore Lodge) he is part of a “reviews team” that identifies new research of particular relevance for education and possible CPD events and he will attend future International Snow Science workshops (these are held bi-annually) in that capacity.

Ebert also provides “essential advice and professional expertise” (T6) to the Scottish Avalanche Information Service (SAIS) – a government funded service that is part of the remit of SAFOS. SAIS provides daily hazard and safety information (avalanche forecasts) to the public during the winter months supporting a GBP 20-30 million winter sport industry (T5). The SAIS website receives roughly 1,000,000 website engagements per year (T6). Ebert collaborates with the forecasting team in CPD events, where R2 is of direct relevance to everyday operational considerations (T6). Moreover, Ebert supports SAIS’s aim to integrate “behavioural research in refining its risk communication and to connect more effectively with its end users” (T6). To this end, Ebert has collaborated with Mark Diggins (the Coordinator of SAIS) in identifying possible challenges in risk communication for their avalanche bulletins. In late 2019, Ebert and Diggins, with support of Behavioural Economist Dr David Comerford (Stirling), started working on an extensive SAIS user survey that was released in March 2021 after delays caused by the COVID-19 pandemic. The results of the survey “will play an important role to both improve our ways of communication and reinforce and identify existing strengths of our service” (T6). SAIS is a member of the European Avalanche Warning Services (EAWS) whose Technical Advisory Board has, by reaching out to SAIS, sought expert opinion from Ebert and his colleagues at Stirling that Ebert facilitated (T6).

Ebert’s impact engagements within SAFOS and SAIS have ultimately created a feedback loop for his own research. They played an important role in his successful AHRC application (F1) – a research project that will strengthen connections with Glenmore Lodge (T7) and SAIS over the coming years. Moreover, his impact work has initiated an expansion of his own research interests and led to new connections with UK, EU and North American researchers in other disciplines thereby providing the basis for sustained and long-lasting impact activities with a variety of international research and impact partners.

4) Co-production of a documentary [“Comfort Zones”](#), challenging preconception about extreme sports participants and raising awareness of responsible risk engagement.

Ebert’s impact engagement also has a “general public”-facing side: he has addressed public misperceptions about outdoor sports participants in a 12-minute documentary (T9a). Ebert acted as the co-producer, academic advisor, main narrator, and skier (T8) in this unique documentary on the value of risk-taking: “there is one thing which [...] no other ski film has ever had before, and that’s input from professional philosophers and proper academic footnotes” (T9c, Roger Cox, Review in *The Scotsman*; see T9d for a further review). The film challenges preconceptions about those engaging in ski-touring as mere daredevils and raises awareness of the wide-ranging competences and skills required to engage in this activity responsibly. The narrative draws on Ebert’s work, R4, R5, with further philosophical input from Professor Laurie Paul (Yale). Directed

by Scotland-based Morrocco Media and sponsored by an outdoor sports company, the film has been viewed 30,000+ times (on facebook), and 24,000+ times (on Vimeo and youtube) (T9a) and was shown at 14 international mountain film festivals in Germany, UK, Italy, Switzerland, Slovakia and Czech Republic (which included 67 screening locations) (T9b). It has been used for charitable and promotional purposes by e.g. British Backcountry (T8) and it was reposted by Scottish ski resorts for tourism purposes.

Morrocco Media states that “working with Philip really highlighted the relevance and importance of philosophical ideas in outdoor sports and risky/extreme sports more general”. In 2020, Ebert provided feedback on two new film projects that expand on the theme of risk and outdoor sports that are currently in development, and Ebert has agreed to act as an academic advisor.

5. Sources to corroborate the impact

T1. Testimonial: Bruce Tremper, author of [Staying Alive in Avalanche Terrain](#). 2018. 3rd edition. Mountaineers Books. Former director of the Utah Avalanche Center and coordinator for avalanche safety at the 2002 Olympic Games at Salt Lake City.

T2. Testimonial: Alan Halewood. Owner of “Climbwhenyoureready” (<https://www.climbwhenyoureready.com>). Certified Mountaineering Instructor and International Mountain Leader. Working at the highest level of UK Mountaineering Association to train and assess new Mountaineering Instructors. In addition, he is Technical Advisor to the National Indoor Climbing Awards Scheme and Safety Consultant for many climbing walls.

T3. Testimonial: Bruce Goodlad. [IFMGA](#)-certified International Mountain Guide. Former Technical Director of the British Mountain Guides (BMG) responsible for training and assessment of IFMGA Mountain Guides. Roles include responsibility to revise the avalanche education element of the BMG training scheme. Partner in an avalanche-education business [Avalanche Geeks](#) and the Alpine Safety Advisor to the Ski Club of Great Britain.

T4. Testimonial: Chair of the [Snow and Avalanche Foundation of Scotland](#). The leading body in the UK to provide advice to SportScotland on the Scottish Avalanche Information Service and act as a forum for discussion of, and support for, research on avalanches in Scotland with the aim of providing advice on course content and syllabi for all levels of avalanche training and supporting appropriately qualified providers.

T5. Compare for 2013 <https://www.bbc.co.uk/news/uk-scotland-highlands-islands-22079124> and for 2017/19: <https://kateforbes.scot/news/scottish-snow-sports-boost-economy-by-31million/>

T6. Testimonial: Mark Diggins, the Coordinator of the Scottish Avalanche Information Service. SAIS is a government-funded service that provides safety information to the public and mountain rescue organisations on a daily basis throughout the winter months for the last 30 years.

T7. Support letter for the AHRC application on “Varieties of Risk” by Head of Snow Sports at Glenmore Lodge.

T8. Testimonial: Dr Stefan Morrocco. Owner of [Morrocco Media](#) – an adventure and sports filmmaking, television and documentary studio and video-production agency, based in rural Perthshire, Scotland. Morrocco Media has worked for numerous companies including VisitScotland, and other Tourism Boards across Scotland, British Cycling, and the BBC.

T9. a. *Comfort Zones* Documentary (Morrocco Media, 2018): <https://vimeo.com/295992429> & <https://youtu.be/8CUhSQMniYI> ; Full information on the documentary available at Comfort Zones Movie Website: <http://comfortzones.philipebert.info/>

b. Festivals that have shown the documentary: <http://comfortzones.philipebert.info/styled/>

c. Roger Cox, ‘Comfort Zones: new film offers a philosophical take on extreme skiing in Scotland’, *The Scotsman* (28th Feb, 2019): <http://stir.ac.uk/5e0>

d. Gayle Ritchie, ‘Exciting new film showcases magic of skiing Scotland’s wilderness’, *The Courier* (18th Feb, 2019): <http://stir.ac.uk/5e3>