THE PERSISTENCE OF SOCIAL HEURISTICS IN BACKCOUNTRY DECISION-MAKING: AN ANALYSIS OF RESORT-ADJACENT USERS

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ABSTRACT: Avalanche fatalities in recreational backcountry settings remain predominantly linked to human judgment errors rather than environmental unpredictability. As participation in lift-accessed backcountry terrain, commonly referred to as “slackcountry” or “sidecountry”, continues to grow, Sun Peaks Resort on Tod Mountain in the interior of British Columbia offers a valuable context for examining the cognitive and social processes that shape risk perception at the resort boundary. This paper investigates how social heuristics, specifically social proof, familiarity bias, and social compliance, persist among skiers and snowboarders transitioning from managed resort environments into the adjacent uncontrolled backcountry. Data was collected using a descriptive cross-sectional survey (n = 67) distributed among users of the lift-accessed backcountry at Sun Peaks Resort, via online backcountry communities and physical signage at resort boundary access points. The survey captured demographic information, formal avalanche training levels (ranging from no training to professional certification), and responses to scenario-based decision-making questions designed to elicit heuristic patterns. Findings indicate that a majority of respondents reported elevated perceived safety when pre-existing ski tracks were present on a slope, regardless of whether they had consulted the official avalanche bulletin, a pattern consistent with the tracks heuristic and social proof. Critically, this tendency was observed across all training levels, including participants with recreational-level courses and professional-level certification, providing evidence of the Training Paradox, as this study terms it. Social compliance pressures, including reluctance to challenge group decisions, were similarly distributed across experience and training categories. The study treats the Boundary Paradox as an interpretive lens rather than a proven causal mechanism, given the absence of a comparative control group. These findings contribute to the literature on the human factor in avalanche safety and reinforce the need for avalanche education programs to address behavioral and social dimensions of decision-making alongside technical hazard knowledge.

KEYWORDS: Avalanche decision-making, social heuristics, social proof, backcountry skiing, risk perception, group dynamics.

1. INTRODUCTION

Recreational backcountry skiing and snowboarding have expanded considerably over the past two decades, driven by advances in equipment technology such as lighter touring bindings, improved avalanche airbag systems, and split-board designs, increased resort-adjacent access infrastructure, and a broader cultural shift toward self-directed outdoor experiences (Haegeli et al., 2010; Jamieson, 2011). Terrain near ski resorts, particularly the area known as slackcountry or sidecountry, defined as terrain accessed from a ski lift but lying just outside the resort boundary, has become a popular and frequently misunderstood point of entry into the backcountry (Haegeli et al., 2012).

At Sun Peaks Resort, located on Tod Mountain in British Columbia’s interior, this dynamic is especially pronounced. Users access lift-served terrain and then transition into adjacent unpatrolled backcountry zones that receive no avalanche control work from ski resort staff. Despite their proximity to managed terrain, these areas carry the same avalanche hazard as remote backcountry settings and are not subject to rescue obligations from resort ski patrol (Haegeli et al., 2012; Jamieson, 2011).

Although avalanche forecasting, safety equipment, and formal training programs have improved substantially, accident investigations continue to identify human decision-making as the primary contributing factor in recreational avalanche fatalities (McCammon, 2002; Atkins, 2000). This so-called human factor describes how cognitive biases, so-

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cial processes, and situational pressures systematically distort risk perception and decision-making behaviour, even among trained and experienced users (McCammon, 2002; Haegeli et al., 2012). Recent scholarship has called for a broader, more neutral typology of the human factor that moves beyond a deficit-based heuristic-traps framing (Skille et al., 2026), and has critiqued the heuristic-traps paradigm itself for vague operationalization and over-reliance on accident data (Johnson et al., 2020).

Central to this dynamic are cognitive heuristics, mental shortcuts that simplify complex judgments under uncertainty (Tversky and Kahneman, 1974; Kahneman, 2011). While heuristics can be adaptive in many contexts, they introduce predictable and systematic biases in avalanche terrain (McCammon, 2002; Furman et al., 2010). The most relevant heuristics in resort-adjacent contexts are social proof, familiarity bias, and social compliance. Social proof refers to the tendency to interpret others' behaviour, including the presence of existing ski tracks, as evidence of safety (McCammon, 2002). Familiarity bias involves underestimating risk in environments that feel familiar or accessible (Haegeli et al., 2012; Hendrikx et al., 2022). Social compliance describes the difficulty of dissenting from group decisions, even when an individual perceives elevated risk (Janis, 1982; Furman et al., 2010; Skille et al., 2026).

The FACETS framework (McCammon, 2004), which identifies six heuristic traps commonly observed in backcountry avalanche decision-making: Familiarity, Acceptance, Commitment, Expert halo, Tracks, and Social facilitation, provides an important conceptual structure for interpreting the behavioral tendencies observed in this study. While Johnson et al. (2020) have argued that several of these constructs are not strictly heuristics in the technical sense but rather a heterogeneous bundle of biases, habits, and group dynamics and that accident-based derivations are subject to known sampling and base-rate problems, FACETS nonetheless remains the most widely cited reference vocabulary in the field and provides a useful starting point for examining behavioral tendencies in a non-accident sample.

2. METHODS

A descriptive, cross-sectional survey (n = 67) examined decision-making behaviors and heuristic reliance among backcountry skiers, snowboarders, and snowmobilers operating in terrain adjacent to Sun Peaks Resort on Tod Mountain, British Columbia. The survey was distributed through two channels: local backcountry-oriented social media groups and physical signage at resort boundary access points. Participation was voluntary and anonymous, with no incentives offered.

The sample spanned six age categories (18–24 to 65+), four experience levels (<1 year to 11+ years), and four training levels (none; AST 1 / AIARE 1; AST 2 / AIARE 2; professional CAA OPS Level 1 / AIARE Pro 1 or higher). The instrument combined demographic questions with scenario-based items grounded in the heuristic traps literature (McCammon, 2002; Furman et al., 2010), measuring four key behavioural variables: perceived safety when pre-existing tracks were present (social proof / familiarity bias), frequency of consulting the Avalanche Canada bulletin (information-seeking), willingness to challenge group decisions (social compliance), and perceived relative safety of lift-accessed versus remote backcountry terrain (boundary perception). Variable selection was informed by the FACETS framework (McCammon, 2004), while acknowledging that this framework has been critiqued for inconsistent operationalization across studies (Johnson et al., 2020).

Several limitations apply. The sample (n = 67) is modest and non-random, likely skewed toward users already engaged with backcountry communities. Self-report data are susceptible to social desirability bias. The absence of a comparative control group from remote backcountry settings limits inferences about boundary-specific effects, and the cross-sectional design precludes longitudinal interpretation. By surveying live users rather than accident victims, however, the design partially addresses the sampling and base-rate concerns identified by Johnson et al. (2020) regarding accident-derived analyses of human factors.

3. RESULTS AND ANALYSIS

3.1 Participant characteristics and sample overview

The survey yielded 67 complete responses, providing a cross-section of backcountry users active in the Sun Peaks Resort area on Tod Mountain. The sample was broadly distributed across age, experience level, and avalanche training, as summarised in Table 1 below.

Table 1: Participant demographics and training levels.

Category	*Subgroup*	*Frequency (n)*	*Percentage (%)*
Age group	18–24	15	22.4
	25–34	12	17.9
	35–44	15	22.4
	45–54	10	14.9
	55–64	9	13.4
	65+	7	10.4
Experience level	< 1 year	4	6.0
	1–5 years	29	43.3
	6–10 years	14	20.9
	11+ years	20	29.9
Training level	None	14	20.9
	AST 1 / AIARE 1	35	52.2
	AST 2 / AIARE 2	6	9.0
	Professional	13	19.4

Note. Values derived from survey dataset (n = 67). Training categories reflect the highest level of formal avalanche certification reported by each participant. AST = Avalanche Skills Training; AIARE = American Institute for Avalanche Research and Education; CAA = Canadian Avalanche Association. Professional is denoted as AIARE PRO 1 & 2 or CAA OPS 1 & 2

3.2 Social proof and the tracks heuristic

Survey responses reveal a consistent and cross-cutting pattern: respondents reported higher perceived safety when pre-existing ski tracks were present on a slope. When presented with a scenario in which they arrived at a backcountry gate without having read the avalanche bulletin but observed 10–15 sets of ski tracks on the intended line, a majority of participants across all training levels indicated that the tracks made them feel at least slightly safer. This pattern is consistent with the tracks heuristic described by McCammon (2002) and represents a direct manifestation of social proof in the decision-making process (Furman et al., 2010; Haegeli et al., 2012).

As shown in Table 2, approximately 64% of respondents with no formal training reported that the tracks made them feel slightly or significantly safer, the highest proportion across groups. However, even among AST 1-trained participants (46%), AST 2-trained participants (50%), and professional-level respondents (46%), the tracks heuristic remained influential. This cross-training persistence is consistent with prior research suggesting that heuristic-based decision-making is not eliminated by technical education (McCammon, 2002; Haegeli et al., 2012; Kahneman, 2011; Hendrikx et al., 2022). Notably, Hendrikx et al. (2022), using GPS tracks combined with surveys, found no statistically significant differences between self-identified intermediate and expert backcountry users on most decision-making items derived from McCammon's heuristic framework — a result closely paralleling the cross-training pattern observed here. The presence of tracks, in the absence of formal hazard evaluation, serves as a widely relied-upon proxy for slope stability, with direct implications for safety communication in slackcountry environments.

Table 2: Heuristic reliance across training levels.

Training level	*Tracks influence (%)*	*Difficulty saying "no" (%)*	*Checked bulletin always (%)*
None	64 (slightly / significantly safer)	14 (yes, often / few times)	8
AST 1	46 (slightly safer)	51 (once or twice / few times)	69
AST 2	50 (slightly safer)	50 (once or twice / few times)	67
Professional	46 (slightly safer)	54 (once or twice / few times)	62

Note. Data derived from survey responses (n = 67). Tracks Influence reflects the percentage of respondents within each training level who reported feeling slightly or significantly safer upon seeing 10–15 ski tracks on a slope without having consulted the avalanche bulletin. Difficulty Saying No reflects the percentage who reported having skied a line they were uncomfortable with due to group social pressure (combining yes, a few times and once or twice responses). Checked Bulletin Always reflects respondents who reported always consulting the Avalanche Canada forecast before skiing familiar backcountry runs.

3.3 Training paradox and social compliance

A central finding of this analysis is the persistence of social compliance pressures across all training levels, which this study designates as the Training Paradox. When asked whether they had ever skied a line they were uncomfortable with because they did not want to be the one to say 'no' to the group, a substantial proportion of respondents across all training categories reported having done so at least once or twice. Among AST 1 participants, 51% reported social compliance incidents; among AST 2 participants, 50%; and among professional-level respondents, 54%. Even among those with no formal training, 14% reported compliance incidents a lower proportion but one that nonetheless reflects the pervasive influence of social dynamics on decision-making behaviour.

These patterns suggest that acquiring technical avalanche knowledge does not reliably lead to behavioural independence in group contexts. This is consistent with the broader literature on the behavioural gap in avalanche safety (Fischer et al., 2019; Haegeli et al., 2012) and with Janis's (1982) documentation of groupthink as a mechanism by which social cohesion suppresses dissent. The Training Paradox observed in this dataset reinforces the argument that avalanche education programs must address the social and psychological dimensions of decision-making alongside technical content (McCammon, 2002; Haegeli et al., 2010; Skille et al., 2026). A parallel pattern is visible in the large-N work of Shonnard et al. (2025), whose survey of 4,792 backcountry users identified a positive correlation between training level and risk willingness, with the highest risk-taking scores found at both the no-training and professional-training extremes a U-shaped distribution consistent with the cross-training persistence observed here. Furthermore, as illustrated in Figure 1, the probability of a collective 'go' decision increases alongside group size, highlighting the diffusion of responsibility among participants.

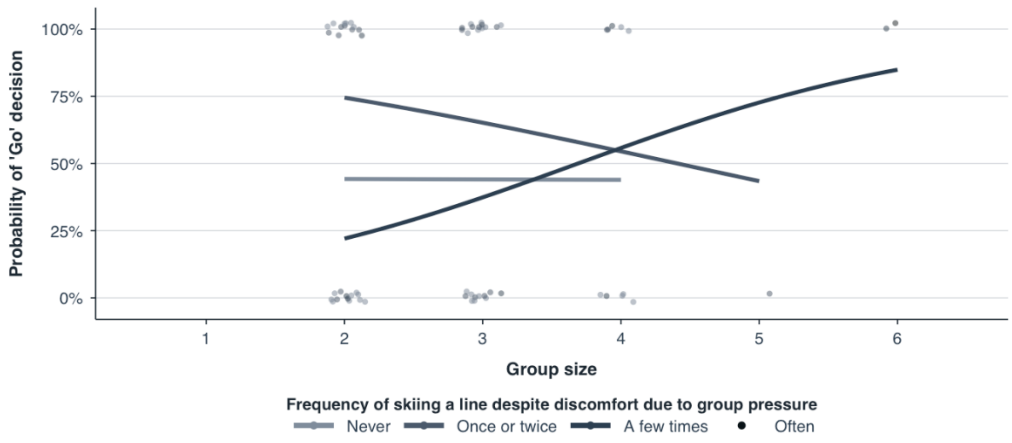

Figure 1: Diffusion of Responsibility

3.4 Views of resort-neighboring terrain

Survey results reveal a nuanced range of attitudes toward the perceived safety of terrain immediately outside the resort boundary at Sun Peaks Resort. Participants were asked to indicate their level of agreement with the statement: 'Terrain that is accessed from a ski lift but lies just outside the resort boundary is generally safer than deep backcountry terrain.' Responses varied across the confidence spectrum, with a meaningful proportion expressing some degree of agreement, particularly among those with no formal training or 1–5 years of experience. Among trained and professional participants, scepticism was more common, though responses were not uniformly cautious.

These findings are consistent with research suggesting that familiarity and proximity to resort infrastructure can generate inflated perceptions of safety in slackcountry terrain (Haegeli et al., 2012). Shonnard et al. (2025) report a related pattern at much larger scale: over 30% of respondents without Level 1 avalanche training expressed confidence in appraising complex terrain, suggesting that overconfidence relative to formal skill is widespread among newer users. However, the absence of a comparative control group in this study precludes definitive conclusions about whether boundary proximity independently drives these perceptions. Accordingly, the Boundary Paradox is treated here as a conceptual framework for understanding the observed patterns rather than as a proven empirical mechanism. The data are suggestive of boundary-related perception effects and are consistent with the theoretical literature, but causal attribution requires more controlled research designs.

4. DISCUSSION

4.1 Interpretation of findings and heuristic persistence

The results of this study support an expanding body of literature underscoring the persistence of cognitive heuristics in backcountry avalanche decision-making. Across the dataset, behavioural tendencies indicate that social heuristics specifically social proof, familiarity bias, and social compliance — remain influential even among participants with formal avalanche training. These findings align with the established literature indicating that technical knowledge acquisition does not reliably produce stable behavioural change in real-world decision-making contexts (Haegeli et al., 2012; McCammon, 2002; Furman et al., 2010).

One of the most consistent patterns in the dataset is the reliance on observable environmental cues, particularly existing ski tracks, as proxies for slope safety. This tendency reflects the tracks heuristic documented by McCammon (2002) and represents a direct application of social proof (Cialdini, 1984) in avalanche terrain. Individuals appear to use the visible evidence of prior travel as a substitute for formal hazard evaluation, particularly in time-pressured or socially influenced contexts, even when they possess the technical training to conduct independent assessments. This underscores the point made by Tversky and Kahneman (1974) that heuristic thinking is a fundamental feature of human cognition rather than a correctable deficiency.

The persistence of social compliance behaviours further supports the interpretation that heuristic reliance in the backcountry is not solely an individual cognitive phenomenon but is structurally embedded in group interaction dynamics. The findings are consistent with Janis's (1982) analysis of groupthink, in which the desire for social harmony and the avoidance of interpersonal conflict suppress the expression of dissent, even when individual members harbour serious reservations. The overall pattern confirms that heuristic processing is deeply entrenched in backcountry decision-making behaviour and is not effectively neutralised by current educational approaches alone. It is worth noting, however, that Johnson et al. (2020) have questioned whether the constructs in McCammon's framework constitute genuine heuristics in the Tversky and Kahneman (1974) sense, characterizing them instead as a mixed set of cognitive tendencies, situational habits, and group-level dynamics. The behavioural patterns documented here, social-proof reliance and compliance, may therefore be better understood within the broader interactional framework proposed by Skille et al. (2026), which situates peer influence and perception within the social and intra-personal dimensions of decision-making.

4.2 Implications for avalanche training and risk education

The findings of this study raise important questions about the effectiveness of current avalanche education frameworks. While formal training programs such as AST courses and CAA professional certification programs provide critical technical knowledge, the results indicate a systematic disconnect between what participants learn and how they behave in the field a behavioural gap consistent with prior research (Fischer et al., 2019; Haegeli et al., 2012). This gap appears to be driven by the dominance of situational

heuristics, social pressure, and time constraints that content-focused instructional models do not adequately address.

These observations point to several practical directions for reforming avalanche education. Training programs would benefit from incorporating behavioural psychology frameworks that explicitly address heuristic traps and the mechanisms through which social compliance suppresses individual risk assessment (McCammon, 2004; Haegeli et al., 2010). Scenario-based learning that simulates realistic group-pressure situations, in which participants must practice expressing dissent or calling a halt, would provide more transferable behavioural skills than terrain and snowpack instruction alone. Explicit instruction on the tracks heuristic and other social proof cues is also warranted, as awareness of a heuristic has been shown to mitigate its influence partially (Kahneman, 2011). Developing structured mechanisms for group decision-making, such as the Turn-Around-Do n't-Die (TADD) framework or formalized go / no-go checklists, could provide groups with tools to counteract the 'saying no' barrier (Furman et al., 2010). Collectively, these considerations suggest that effective avalanche safety education requires a shift from a primarily knowledge-transmission model toward a more holistic approach that integrates cognitive, social, and behavioural training components. The supply-side challenges of such a shift should not be underestimated. Dassler et al. (2025), in a mixed-methods study of Norwegian avalanche instructors, found that human-factors content was perceived as among the most difficult to teach and least likely to be attained by participants, with instructors describing it as abstract and reporting that they felt inadequately prepared pedagogically to deliver it effectively. Curriculum reform that addresses behavioural and social dimensions will therefore need to be paired with parallel investment in instructor preparation and shared vocabulary (Skille et al., 2026).

5. CONCLUSION

This study examined how social heuristics shape decision-making among backcountry users operating in lift-accessed terrain adjacent to Sun Peaks Resort on Tod Mountain, British Columbia. Drawing on a cross-sectional survey of 67 participants, the findings provide consistent evidence that heuristic-driven behaviour particularly social proof, familiarity bias, and social compliance remains a significant factor in risk perception and decision outcomes across all experience and training levels. These patterns reinforce the foundational argument of the human factor literature: that decision-making in avalanche terrain is governed not solely by technical knowledge, but by the complex interaction of cognitive processes, social dynamics, and environmental context (McCammon, 2002; Haegeli et al., 2012; Furman et al., 2010; Hendrikx et al., 2022; Skille et al., 2026).

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