

CONTRIBUTING FACTORS TO AVALANCHE ACCIDENTS:

(based on research done by Ian McCammon, PhD)

ALPTRUTH

Avalanches in last 48 hours

Loading in the last 48 hours
(from snow or wind)

Path identifiable by a novice

Terrain trap

Rating of Considerable
or more by the forecast center

Unstable snow (collapsing,
cracking)

Thaw instability (rapid
temperature increase)



****92% of avalanche accidents that McCammon studied had 3+ of these factors present**

Consider the season history, as well.

- **Is it a year to be more cautious than is typically warranted?**
- **Do you have a persistent weak layer?**

HUMAN FACTORS



Heuristic Traps in backcountry travel:

Based on research by Ian McCammon, PhD.

Familiarity with the terrain

Acceptance within the group

Commitment to a goal

Expert Halo – not questioning “the leader”

Tracks – seeking first tracks (scarcity)

Social Consensus – seeing tracks on a slope

Other Human Factors

- Poor communication
- ‘Powder fever’
- Lack of experience
- Lack of leadership
- Overconfidence
- Goals that don’t line up with the snow conditions
- ‘Safety in numbers’ – the risky shift
- Fatigue
- Environmental distractions
- Personal distractions

Tools for recognizing and managing the Human Factor:

- Use the backcountry checklist when traveling in the backcountry
 - Choose your partners wisely
 - FACETS test
 - Pre-mortem test

‘What would my mom read in the paper if anything happened on this slope?’

FACETS – Six Common Heuristic Traps

There are dozens of biases that may affect our decision-making when traveling in backcountry avalanche terrain. We use simple rules (AKA heuristics) to overcome the complexity of real-world situations (whether it be driving during rush hour in cities, negotiating supermarkets the size of small towns, or making decisions about snow stability). Heuristics work most of the time, but most of the time is not enough in high consequence environments. Our first defense is awareness of these heuristic “traps”. The second step is acknowledging which traps you may be most susceptible to, and the third is choosing partners who don’t accentuate your frailties.

The best research on how these biases affect our decision-making in avalanche terrain is by Ian McCammon. If you search for “Ian McCammon heuristic traps” a number of papers will come up if you are looking for more information.

A brief summary of each of these heuristics follows. Italicized examples are taken from an online tutorial put together by Black Diamond and Powder Magazine.

Familiarity

When a situation, or terrain, is familiar, we tend to treat it passively, as all previous encounters have ended positively. The trap is when conditions have changed, but outwardly they appear the same. This trap

seems to affect experienced people more than novices, but all are susceptible to it. The bottom line solution is humility. Realizing that in the big picture you haven’t seen this terrain in the conditions that it takes to slide is a good first step. *I’ve skied this line dozens of times, and it’s always held.*

Acceptance

Humans are social creatures. We typically seek to be viewed positively by others, whether it be by people we respect or people we want to be our friends. This is often gender-driven and may manifest itself by actions that are inappropriately bold. This trap can be seen in all groups, but is most common in groups with some avalanche training. There aren’t easy solutions here, other than realizing that if things go wrong the acceptance you are seeking isn’t going to be there.

I’m not going to be the one to chicken out/ruin the day, or I need to please my sponsors.

Commitment

Simply put, we are often committed to a goal. The trap is when conditions are inappropriate for the goal that we have chosen (summit, line, traverse...). One solution is choosing appropriate goals at the start of the day, so that you are not confronted with disappointment when you have traveled far and worked hard. *We’ve come this far we might as well go the whole way.*

Expert Halo

This can take many forms, but its most common manifestation is when someone has more experience, or better fitness, and people tend to defer to that person's opinions and decisions. The problems are two-fold. One: that person may not be a true expert (beware of anyone that calls himself an expert!). The second problem is that one person's collective experience and expertise is seldom better than the group's as a whole. Solution:

Acknowledge that everyone is fallible and if you have misgivings, it is imperative that you voice them.

The guide, teacher, or the local guy must know what he's doing.

Tracks

An analog for the Scarcity heuristic. This is a very common heuristic around ski areas and popular backcountry areas - AKA Powder Fever. When there is a perceived limited quantity, we are wired to charge ahead and get it before it's too late. This is very common on powder days, especially after weeks of bad skiing and riding. Solution: Realize that with a bit more effort there are always places to find good snow. Don't let that rush for first tracks, or any tracks, put you in a place with no escape routes. Good pre-trip planning can help alleviate this pressure as well.

Let's get the goods before someone else does.

Social Consensus

The belief that because other people are doing it must be safe... or right. Just the presence of other groups can make you feel like you're making a good decision. Consider how you feel as the first person breaking trail into a remote destination vs. how you feel following a well-traveled bootpack. The trap comes when you choose more challenging terrain in the near vicinity OR when the natural variability within the snowpack allows you to trigger the same slope that others have skied without incident. The solution involves making your own decision and not letting the presence of others make the decision for you.

Those other guys, or my buddies, are ripping it- clearly, it's safe.

Clearly there are more human factors than just the FACETS to deal with, but these are frequently involved in avalanche accidents. If you have a bad gut feeling FACETS are one way to see if human factors are part of it. If you have had previous accidents or near-misses, look at them and see if there are any commonalities between them. If you are most prone to Acceptance and Expert Halo you should reconsider the people you commonly travel with. If you are prone to Familiarity, Commitment, and Tracks then you should choose partners who are comfortable calling you out on your decisions. In all cases, pre-trip planning can help alleviate problems during the tour.

BIASES PRESENT IN DECISION MAKING SCENARIOS

Resulting – equate a good outcome with good decision making

Effort/ skill	More	Bad luck	Deserved success
	Less	Expected failure	Got away with it
		Bad	Outcome Good

Blind Spot Bias – change the narrative to fit the story we tell ourselves

MANAGEMENT TOOLS IN COMPLEX ENVIRONMENTS

Acknowledge uncertainty

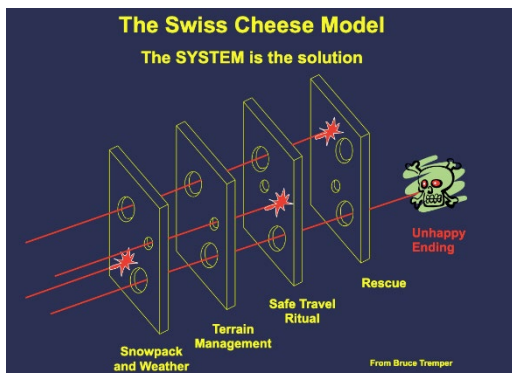
Build a truth-seeking group – it is important to get honest feedback about your decisions.

Pre Mortem – if you end up on the witness stand, can you defend your decision?

Visualize failure – understand what can go wrong and address these possibilities or make a different decision

Backcast – have a conversation with your future self about what went wrong

Have several lines of defense in place – ie. The Swiss Cheese Model



Have a systematic approach to planning:

What avalanche problems are present?

Where are they likely to be found?

How likely is it to trigger an avalanche today?

How Big could the avalanche be?

Understand what type of poker hand you might be playing today

