Heuristics – rules of thumb or cognitive shortcuts that influence judgment and decision-making – have received a good deal of attention in recent years as potential causes of human-triggered avalanche accidents (Blair, Bostock, Lau, Quade & Wilkes, 2010; Tremper, 2001; Furman, Shooter & Schumann, 2010; McCammon, 2000; Simenhois and Savage, 2009). McCammon’s initial work correlating FACETS heuristics – familiarity, consistency, acceptence, expert halo, social facilitation, and scarcity (tracks) heuristics – avalanche accidents (2004) has provided a foundation to explore other potential cognitive shortcuts, such as Margaret Wheeler’s discussion of a developing gender heuristic (2008).

The number of heuristics complicit in avalanche accidents seems to be on the rise. With this proliferation in rules of thumb the general take-home message with the unveiling of each new heuristic has been a warning to be wary of how previous experiences affect decision-making capability in avalanche terrain. As Wheeler states, it is important for backcountry users to examine: “...[How] do your own perceptions stem from your own experiences? How might they be shaped by them, and how might they be leading you astray? What might your experience level, your training, and your background do to shape your personal mindset, therefore your decision-making dynamic?” (Wheeler, 2008).

Assessing what previous perceptions, mental maps, and stereotypes we all bring into the backcountry is crucial to confronting the potential for heuristics to negatively effect the judgment and decision-making process. That said, in the effort to name and quantify the use of shortcuts, what often gets pushed to the side is why the shortcuts are created in the first place. In other words, if heuristics are potentially harmful, why are they so commonly used?

Through a deeper look at the dual-nature of heuristic specific to avalanche terrain, it’s clear that individual rules of thumb can be both situationally useful and harmful; by discussing how lived experience creates heuristics, the current research in avalanche education, which focuses on heuristics as “traps,” becomes just half of the story. Perhaps most importantly, examining how our daily lives inform our heuristic framework provides one possible reason as to why it’s so tough to teach decision-making through heuristic and see positive results.

Heuristic paradoxes

When students in avalanche courses are instructed to watch out for the six heuristic traps outlined by McCammon, or the gender heuristic identified by Wheeler, they are essentially being asked to be wary of how their previous experience influences their judgment and decision-making. While this call for self-reflection is important, it can also be problematic.

For example, the familiarity heuristic focuses on the use of past experience to deal with present situations in familiar terrain. A party who assumes a slope “never slides” because the group has skied it a billion times with no issues is relying on the familiarity heuristic. On the other hand, if the same party sees or hears bull’s-eye data and decides to pack it in for the day, they simply didn’t want to touch the backcountry. Even when the hazard level dropped, the experience most readily available, the one that had a lasting impression – probing in-bounds – was what guided their decision-making.

In both cases listed above, the availability heuristic influences judgment and decision-making. That said, it’s difficult to say that either group’s decision to trust the avalanche report or probing in-bounds was unjustified or a “trap.”

The Sensibly Guided Search

It seems heuristics can be useful or harmful, and a single heuristic – familiarity or availability – can be a dangerous, irrational component to determining whether or not to drop in, it may come as a surprise that a decision based on an avalanche forecast is itself a heuristic.

The availability heuristic is defined as the process of using the most recent or influential information to guide one’s decision-making (Priest & Gass, 1997/2005; Tversky and Kahneman, 1982). Availability accounts for the subjects in study by Furman, et. al., who relied, more than anything, on avalanche reports to make decisions in the backcountry (Furman, Shooter & Schumann, 2010). Availability also accounts for two of my friends who refused to ski in the Wasatch backcountry for the better part of the 2008/09 season. After standing in the probe line at Snowbird, helping search for avalanche victim, Heather Gross, they simply didn’t want to touch the backcountry. Even when the hazard level dropped, the experience most readily available, the one that had a lasting impression – probing in-bounds – was what guided their decision-making.

In both cases listed above, the availability heuristic influences judgment and decision-making. That said, it’s difficult to say that either group’s decision to trust the most readily available information – avalanche report or probing in-bounds – was unjustified or a “trap.”

The Sensibly Guided Search

It seems heuristics can be useful or harmful, and a single heuristic – familiarity or availability – can be a dangerous, irrational component to determining whether or not to drop in, it may come as a surprise that a decision based on an avalanche forecast is itself a heuristic.

The availability heuristic is defined as the process of using the most recent or influential information to guide one’s decision-making (Priest & Gass, 1997/2005; Tversky and Kahneman, 1982). Availability accounts for the subjects in study by Furman, et. al., who relied, more than anything, on avalanche reports to make decisions in the backcountry (Furman, Shooter & Schumann, 2010). Availability also accounts for two of my friends who refused to ski in the Wasatch backcountry for the better part of the 2008/09 season. After standing in the probe line at Snowbird, helping search for avalanche victim, Heather Gross, they simply didn’t want to touch the backcountry. Even when the hazard level dropped, the experience most readily available, the one that had a lasting impression – probing in-bounds – was what guided their decision-making.

In both cases listed above, the availability heuristic influences judgment and decision-making. That said, it’s difficult to say that either group’s decision to trust the most readily available information – avalanche report or probing in-bounds – was unjustified or a “trap.”
**Unfreeze – Change – Refreeze: A Model for Heuristic Analysis**

**Story by Chris Zajchowski**

While the models, metrics, and tests for heuristic stability have continued to evolve and improve to be quicker and more efficient “easily-applied decision tools” (McCammon, 2004), it appears stability tests for our “fast and frugal” heuristics (Gigerenzer, 2009) haven’t kept up.

Acronyms FACETS and ALPTRUTH have been helpful models to submit potential heuristic and environmental factors to memory (McCammon & Hageli, 2007). Kenny McBride’s (2010) _Look, Listen, and Feel_ provides an additional model to put acronyms into action. In addition to these tools, _The Change Model_, developed by Kurt Lewin, provides a framework to transfer heuristics from their fixed, static nature into components to assess decision-making in avalanche terrain (Audi, 1999; Lewin, 1951; Luckner & Nadler, 1997).

As a physicist and social psychologist, Lewin used the phrase changes in h2o – specifically the imagery of a block of ice that has been re-frozen into a different shape after having been melted – to provide a metaphor that is now widely used to describe a potential model for organizational change, as well as the deconstruction of mental models (Lewin, 1951). _Unfreeze – Change – Refreeze_ metaphor, analogous to the corn cycle in an isothermal snowpack, also seems an appropriate tool to connect backcountry users who are familiar with assessing spring corn snowpack conditions to a conversation-around assessing their own heuristic operating.

**Unfreeze**

The corn cycle exemplifies changing snowpack composition, with optimal skiing occurring following the unfreezing of a bullet-proof surface. Similarly, Lewin’s change model argues the best decision-making is achieved following the unfreezing of static, cognitive shortcuts. Lewin refers to this unfreezing as “the unlearning process,” which will provide more room for new learning (Luckner & Nadler, 1997). For example, a skier who has used McCammon’s “familiarity heuristic” (2004), unfreezing the notion that a slope “never slides” will allow for a skier to make additional observations to influence her decision-making. Have there been any recent snowmelt conditions, wind events, etc.? Any pertinent information from hand-shears, pole plants, or hasty pits? Any present bull’s-eye data? In this situation, after the unfreezing of the familiarity heuristic as the driving factor in decision-making, a skier can use tools like ALPTRUTH; FACETS; Look, Listen and Feel; and stability tests to assist in her decision-making.

**Change**

When the snowpack changes from bullet-proof to corn, the perfect window to ski within the corn cycle is created. When the decision-making of the skier changes from relying on automated, unconscious heuristics to a heuristic procedure (Audi, 1999), from a fixed rule to open search, the perfect window for decision-making is created. The unfreezing of the skier consciously recognizes that she is relying heavily on the familiarity heuristic and quickly stop to analyze if there is other pertinent data that corroborates or contradicts her heuristic.

In doing so, she doesn’t rely on the knowledge from her previous experience that the slope “never slides,” but she tests out the heuristic against other pertinent information. She takes the heuristic and adopts it as part of a broader heuristic procedure or sensibly guided search.

**Refreeze**

As the temperature drops, the snowpack refreezes, and the corn cycle starts all over again. The same seems true for heuristics within a heuristic procedure. Following any learning experience, situational lessons will be extrapolated to reinforce old heuristics or potentially form new ones (Luckner & Nadler, 1997). Those lessons will then be re-refrozen into an individual’s mental map, and their situational relevance will be tested another day.

For example, after returning to a bull’s-eye to jump into the slope that “never slides,” solely on the basis of that heuristic, our skier unfroze her past learning to create space for other environmental data. After changing her automated process to make room for new learning, she was in the perfect headspace to analyze other data and make a decision in her sensibly guided search. In this case, she assessed pertinent environmental factors, gave herself and her party the green light, and hit some hero pow.

At the bottom of the slope she refroze her experience into a familiar heuristic: “The slope is a corn cycle.” When she returns to the same slope the process starts all over again – taking into account previous her experience, but keeping it from biasing her to a heuristic. When decision-making factors present on that specific day.

---

**REFERENCES**


---

**Chris Zajchowski** is currently program coordinator in the Office for Professional Education at Loyola University, Chicago, Illinois. Prior to this he worked in Jackson, Wyoming, and skied Teton Pass on a regular basis. He’s happy to have a good job, but nothing surpasses the adventure and good skiing.