OBVIOUS CLUES METHOD: A User's Guide

Story and photos by Ian McCammon

There is mounting evidence that this recurring pattern arises, at least in part, from human factors: mental habits and shortcuts that help us navigate the civilized world but can be deadly when we use them in avalanche terrain unconsciously.

A few years ago, I found that some of my research on decision-making had inadvertently resulted in a simple method to minimize the influence of human factors in avalanche terrain. The method is by no means perfect, but it seems to help students recognize when their decisions begin to fall into the classic avalanche accident pattern. Many students have been excited to learn a simple decision guide that doesn’t rely on years of experience or detailed knowledge of snow science. In this article, I’ll describe the method and how it can be taught, in hopes of making avalanche terrain navigation the civilized world but can be deadly when we use them in avalanche terrain unconsciously.

Years ago, forecaster Dale Atkins and I were talking over beers in the wake of several horrific avalanche accidents. “It’s weird,” he said, “how the names change, but the accidents stay pretty much the same.”

Dale and other avalanche professionals have long recognized that there is a recurrent pattern to avalanche accidents. The pattern goes something like this: A group of experienced skiers or riders, often with avalanche training, seemingly ignores obvious signs of avalanche danger and ventures onto a steep slope. There they trigger an avalanche that catches and kills some or all of them. Viewed from the outside, the group’s decision to enter the slope seems starkly at odds with the obvious danger.

To find out, I examined over 700 avalanche accidents in the U.S. for evidence of seven obvious clues (see sidebar, next page). These clues have long been cited in avalanche training materials as unequivocal signs of avalanche danger. In accidents where all seven clues could be accounted for (about 250 cases), no single clue stood out as being a causative factor. But what was striking was the large number of obvious clues (median 5) that were apparent to victims in the majority of accidents. In other words, the pattern that Dale and others had observed through the years wasn’t an illusion. The typical avalanche victim did seem to ignore many signs of avalanche hazard.

In a series of follow-up studies, I looked at how this pattern correlated with avalanche training (low correlation: McCammon, 2000) and human-factors cues (high correlation: McCammon, 2003). As an analytical tool the number of clues is admittedly pretty coarse metric, but it had the advantage that it didn’t depend on knowing accident rates or the exposure frequency of any user group.

The obvious clues method is pretty straightforward. A person simply runs down the checklist and counts up the number of clues that they have observed. Table 1 shows how the number of clues relates to conditions under which past accidents have occurred.

<table>
<thead>
<tr>
<th>Clues</th>
<th>Type of Accident</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Trivial</td>
</tr>
<tr>
<td>2</td>
<td>Minor</td>
</tr>
<tr>
<td>3</td>
<td>Major</td>
</tr>
<tr>
<td>4</td>
<td>Severe</td>
</tr>
<tr>
<td>5</td>
<td>Critical</td>
</tr>
</tbody>
</table>

From a practical perspective, I’ve found that things start to feel serious when I’ve observed three of the seven obvious clues on a tour. Turning around at this point may not be mandatory under all circumstances, but this is certainly a point where I take a deep breath, re-assess my goals, and weigh my next decisions very carefully. Students likewise have found three clues to be a reliable warning flag that their exposure to avalanche hazard is rising sharply.

Things start to get tricky at a threshold of four clues. Field experience shows that this is when the
situation starts to feel “out there,” margins of safety grow thin, and finding a safer route starts to seem like a Really Good Idea. At four clues, the actual proportion of accidents prevented varies by the climate and elevation.

When more than four clues were present, the percentage of historical accidents prevented drops dramatically. The actual decrease varies significantly with avalanche climate, elevation, and other variables. Field experience indicates that under these conditions, advanced terrain knowledge, well-developed route-finding skills, and a solid stability assessment are no guarantee of safety. Sadly, it seems that these are precisely the conditions where human factors kick in with a vengeance, as people convince themselves that things aren’t really that bad or that they have the skills to mitigate the rising danger. In these moments, the more alert members of a group can use the obvious clues method as a tool for communicating their alarm and hopefully stopping an accident before it happens.

Prevention vs Prediction

One of the biggest obstacles to teaching the obvious clues method is dealing with people’s expectation that it somehow predicts avalanches. If a simple checklist could reliably predict avalanches, then we wouldn’t need snow-safety experts, forecasters, or seasoned guides. It turns out that the best we can do is identify conditions that were typical of past accidents (those patterns again). An accident may not happen if there are many clues present, but if one does, it will fit the classic pattern. Someday, when we have reliable data on the conditions under which people don’t trigger avalanches, we’ll be able to develop predictive tools. But until then, past accidents can only tell us how to prevent similar accidents in the future.

I’ve found it helps to explain the distinction between prevention and prediction by using the metaphor of an aviation checklist. When preparing for takeoff, pilots use a simple checklist to make sure they’ve examined the key variables that would prevent most crashes. If they ignore a few items on the checklist, it doesn’t predict that the plane will crash. But if a crash does occur, it may well be due to the items that the pilot ignored.

Teaching with the OCM

Like most people, I have trouble remembering the complete list of obvious clues. The following are two memory aids that I’ve found helpful.

ALP TRUTH: Avalanches, Loading, Path, Trap, Rating of considerable or higher, Unstable snow, Thaw instability

This was the original mnemonic for remembering the seven clues, but it presents them in a different order than you are likely to encounter on an actual tour. The result is that you have to skip around in the checklist in order to keep track of the total number of clues.

Another memory aid avoids this problem by creating a running checklist in about the right order:

Crazy Ava’s Unstable Patter Traps Local Thugs: Considerable, Avalanches, Unstable snow, Path, Traps, Loading, Thaw

Both memory aids appear to work well, despite the fact that poor Ava suffers all manner of unsavory attributions on high-hazard days.

One advantage of the obvious clues method is that it can be used for all stages of travel in avalanche terrain: reading an avalanche bulletin, planning a tour, route finding, and slope evaluation. Students seem to appreciate its flexibility and how it reinforces the importance of staying alert for key clues at different points in a tour. I’ve found that introducing the method early in a course saves time since it provides a framework around which later phases of the course (especially the field portions) can be constructed.

The Future

Like other decision tools for avalanche terrain, the obvious clues method is in a very early stage of its evolution. More work remains to be done on refining the clues and studying the ways that people use them to make decisions. Over time, it is possible that consistent use of the method among recreationalists might actually change the pattern of avalanche accidents, with more accidents happening at lower clue thresholds as people avoid avalanche slopes under more serious conditions. Such shifts in the classic accident pattern may be one way of tracking the widespread use of this and other decision methods (McCammon and Haegeli, 2006).

Although it has gained some popularity, the obvious clues method is certainly not perfect. It is a starting point on which I hope that others will build. But in the meantime, it seems to be a practical tool to help novices recognize the conditions that have taken lives in the past and start them on the road to developing avalanche skills that go beyond simple checklists.

References


Ian McCammon is an avalanche researcher, educator, and consultant who lives and thrives in Salt Lake City. Trained as an engineer, he often wonders how he ended up studying Really Hard Problems like why people die in avalanches when they know better. In his spare time he enjoys skiing in the Wasatch Range, where the snow is usually crusty and shallow. Really. Tell everyone you know.

In general, having three or more clues present is a sign that your next decision should be made with care. At low and moderate hazard, be especially cautious if the bulletin presents them in a different order than you are likely to encounter on an actual tour. The result is that you have to skip around in the checklist in order to keep track of the total number of clues.

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