

# With Snowboard Movement Analysis, There Is No Black and White

By **CODY MALLORY**

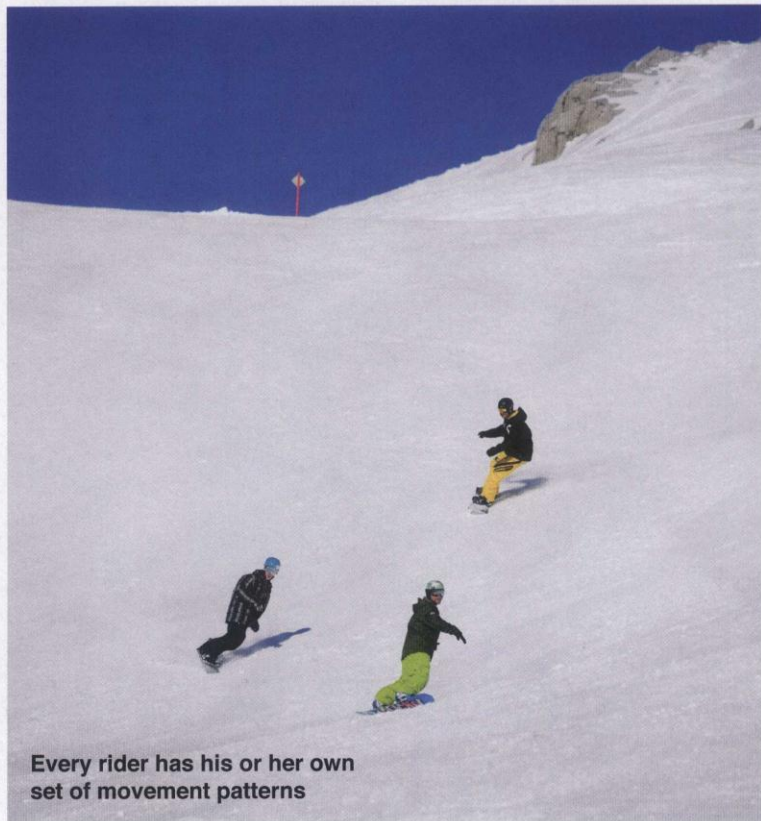
In snowboarding there are very few things that fit into nice and neat categories; there is going to be an exception to every “rule.” ¶ Dave Lynch made this clear in his article “Embrace Differences to Help Style Thrive,” which appeared in the winter 2010 issue of *32 Degrees*. “Snowboarding isn’t math,” he wrote.

“More often than not, there’s more than one answer—and many shades of gray.” This is especially true when we start discussing the difference between carved turns, skidded turns, and their dynamic and basic variations. The extremes of each are easily identified regardless of an instructor’s experience, but the subtle nuances that differentiate one from another can seem dizzying.

I’ve seen eyes glaze over when this topic is covered. I’ve also sat through several video analysis sessions where instructors/examiners have debated whether or not a turn was basic, dynamic, carved, skidded, or scarved (that is, a combo platter of skidded and carved). If we can’t identify the characteristics that distinguish turn shape within a controlled video analysis session—where we’re able to rewind, slow down, and pause the video—how can we accurately make these calls out on the hill? Perhaps it is time to question how we perform movement analysis, and the way we categorize the different turns that we see.

I realized this a while back when I was working with a group of new-

hire instructors. I had introduced the concept of skidded and carved turns, with dynamic and basic variations. Upon watching their eyes and listening to their responses, it became evident they didn’t completely grasp the concepts I was presenting. Since breaking these concepts into definitive categories



**Every rider has his or her own set of movement patterns**

Cesar Pionto

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did not work for me or the group of instructors I was training, I asked myself "is it the teaching that is unsound or the teacher?" I went back to the drawing board to develop a more tangible analysis tool, with a different approach to identifying dynamic versus basic turns and skidded versus carved turns.

What I discovered is that there are as many movement patterns as there are riders, and we need to consider that every rider has his or her own set of movement patterns. While they may resemble that of other snowboarders, these movements are unique to the rider and represent the rider's snowboarding "fingerprint." These unique movements, coupled with differences in equipment and setups, blur the lines of separation between various turn types and dynamism—and the result is an artistic, individualized interpretation of what snowboarding should look like.

### DYNAMIC VERSUS BASIC

Whether a turn is dynamic or basic is largely determined by how the rider uses and blends flexion/extension and rotation. A rider performing basic turns will typically exhibit passive movements and primarily rely on flexion and extension to manipulate the snowboard. A rider performing basic turns also exhibits some or all of the following characteristics: minimal or, at times, huge and wild (but generally ineffective) body movement while turning the snowboard, and a center of mass that follows the same general path as the snowboard (just slightly to the inside of the turn).

Dynamic turns are at the other end of the spectrum. When watching a rider who is riding dynamically you'll see more active/aggressive movements that blend flexion, extension, and rotation throughout the turn. The rider's center of mass travels a different path than the snowboard. For example, when riding dynamically a rider will anticipate a new turn by driving the knees and hips in the direction of the new turn while the board is still completing the old turn.

TABLE 1

## REFERENCE ALIGNMENTS

1. Shoulders, hips, and knees are perpendicular to the front foot.
2. Shoulders and hips are aligned with the terrain in which the board is traveling.
3. Center of mass is aligned between the feet and over the board or working edge.

FIGURE 1

At the initiation of the turn, the rider's center of mass moves toward the apex of the turn.

Throughout the shaping portion of the turn, the rider's center of mass travels to the inside of the path of the snowboard.

At the completion of the turn, the rider will make either flexion or extension movements to decrease pressure on the board in preparation for the new turn.

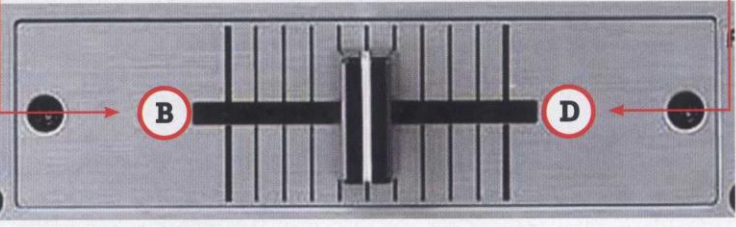
FIGURE 2

### BASIC

- ◆ Rotation is nearly nonexistent
- ◆ Minimal (or wild and ineffective) body movement in a turn
- ◆ Minimal variance in the path of the center of mass and snowboard
- ◆ Reference alignments are maintained

### DYNAMIC

- ◆ Increased blend of flexion/extension and rotation
- ◆ Greater variance in the path of the center of mass and snowboard
- ◆ Anticipation of the new turn
- ◆ Riding in and out of the reference alignments



By blending movements and increasing range of motion, the rider is able to apply or decrease pressure, effect edge angle, and/or pivot the snowboard throughout the turn. This active use of the board performance concepts allows the rider to actively manipulate the snowboard and, in most cases, increase its performance. Another way to look at it is that basic riding relies mostly on a balanced position that allows the *board* to shape the turn, whereas dynamic riding involves movements that manipulate the board through edging, pressure, and rotation so the *rider* controls the shape of the turn.

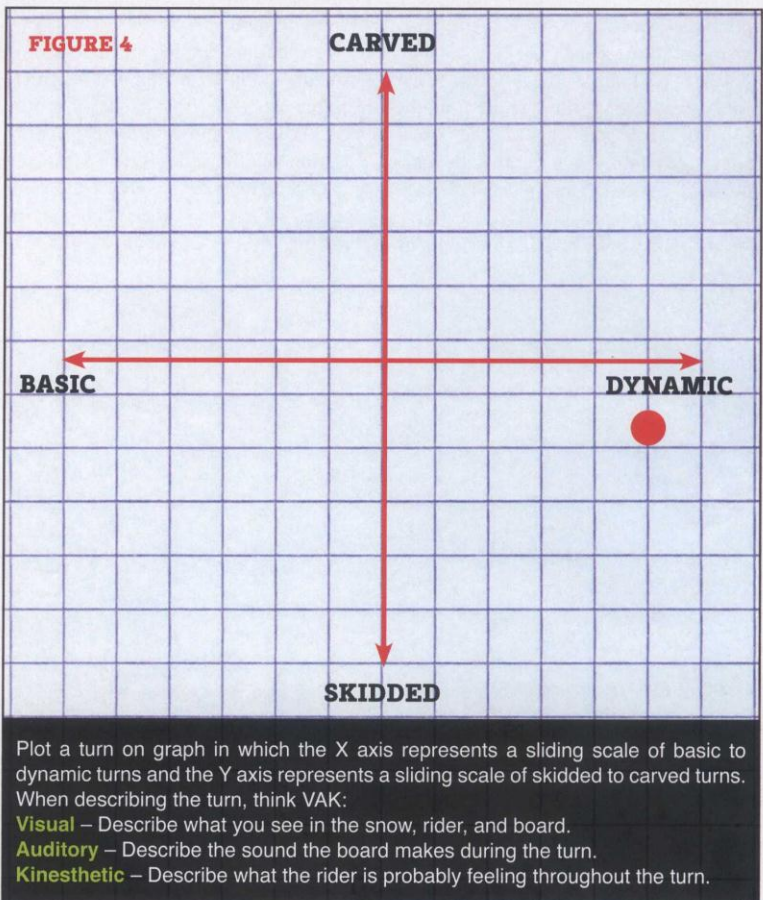
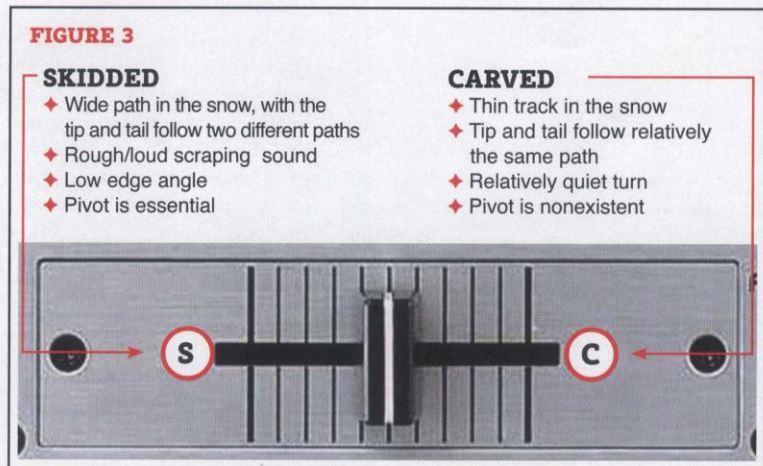
At these extremes, it's easy to tell the difference between dynamic and basic turns. When observing intermediate to advanced riders it's also a good idea to watch the rider's reference alignments (table 1). If the reference alignments are maintained throughout the turn it is basic; if the rider moves in and out of the reference alignments throughout the turn consider it dynamic (fig. 1).

That said, most riders don't ride at either extreme, which makes categorizing performance an inexact science. At what point does a basic turn become dynamic? I'm with Lynch: "Snowboarding isn't math" and there is no equation or an exact amount of movement that determines the boundary between basic and dynamic turns. In any run, a rider flows back and forth, in and out of the distinguishing elements. With the dividing line blurred, you can look at the difference between basic and dynamic turns by using a sliding scale—a tuner, so-to-speak, rather than a switch (fig. 2).

#### CARVED, SKIDDED, AND SCARVED

You can use the same sliding-scale concept when looking at the difference between skidded and carved turns (fig. 3). At one end of the spectrum is the skidded turn, the common characteristics of which are: wide path in the snow, low edge angle, a loud scraping sound (imagine saying "shhhh"), reliance on pivoting, and simultaneous sliding and slipping.

On the opposite end of the spectrum is the carved turn: tip and tail traveling through the same point, a quieter turn (like inhaling an "ffff"), and a lack of pivot. What results is a linear graph with the end points representing the



extremes. A rider performing a sideslip would be at one end of the spectrum, while a rider competing in a boardercross event would be at the other. As with the dynamic and basic turns, riders mainly ride somewhere between the two extremes with variance in the degrees of tilt and pivot determined by where

the turn is plotted on the line.

Scarved turns make up the gray area, or the space between the two ends of the spectrum. Again, scarved describes a turn that is skidded in one portion and carved in another. A rider can be in a carved turn initially, but then fade into a skid as the turn nears completion.

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### PUTTING IT ALL TOGETHER

Combine the two sliding scales into an X-Y axis graph and you have a literal, tangible tool. In other words, when assessing a rider's characteristics draw intersecting X and Y axes in your ever-accessible notepad and plot what you see (fig. 4).

Next, test your assessment by putting what you see and sense into words—so that others can relate to the information. This, of course, is the whole purpose of using the analysis tool.

By the way, it makes sense to tailor your assessment to your student's learning preference, be it visual, auditory, or kinesthetic. For the turn plotted in figure 4, the narrative might go something like this for a visual learner: "I plotted you right here for a couple of reasons. First, if we look back up the hill at your track, you can see that it is fairly narrow. This clue tells us

that while your turns were skidded they lacked pivot and steering, which is not necessarily a bad thing. Another reason I plotted you here is because your turns were very dynamic. I could really see you driving your knees and hips in the direction of the new turn. You were also demonstrating a fairly large range of motion in both your hips and knees." (I recommend mimicking the student's movements while describing them.)

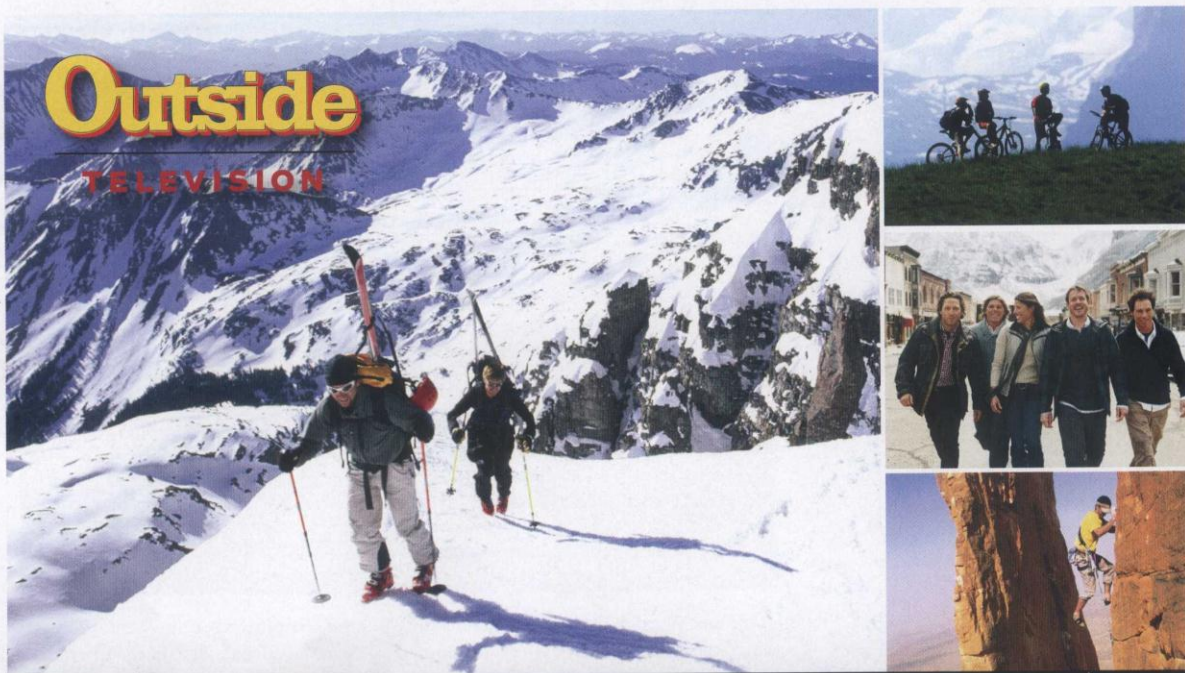
To get the most out of this movement analysis tool you'll, of course, want to assess more than just a single turn. Try to establish a sense of the rider's movement mix by continuing to plot characteristics as he or she performs a variety of turns.

Imagine how your own turns would show up on the graph as you negotiate your favorite run. Most likely you would see a tight, but shotgun pattern within a region of the axis, right? However, as the terrain and/or snow conditions change, so too do goals and tactics. By plotting your students on different

terrain and in different conditions, you can get a feel for their adaptability and versatility. If that shotgun pattern remains in the same spot regardless of the terrain and conditions it could be an indication of underdeveloped skills.

As your critical eye develops and your descriptions evolve from absolutes (like dynamic carve) to "mostlys" (largely, primarily, fundamentally; you pick the term), your axis can be more virtual—remaining in your mind's eye—provided you are able to verbalize your mental notes. When you eliminate the need for finite, polar descriptors, and begin employing terms of relativity—words such as appropriate, effective, efficient—you allow for the nuances that individuals bring to the sport. You downplay the math, and accentuate the artistry. ☺

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