*Supporting narrated video (NV) demonstrations, high-speed video (HSV) clips, technical proofs (TP), and all of my past articles can be accessed and viewed online at **billiards.colostate.edu**. The reference numbers used in the articles help you locate the resources on the website. If you have a slow or inconvenient Internet connection, you might want to view the resources from a CD-ROM or DVD. Details can be found online at: **dr-dave-billiards.com**.*

Recently, I performed a set of experiments to determine whether or not more spin can be applied to the cue ball (CB) by swooping/swiping/pivoting the cue during the stroke. The alternative is to use a straight stroke with the cue aligned in the desired direction with the desired tip offset (for a desired amount of sidespin) before the stroke. Online Video **NV F.2** demonstrates both types of strokes, shows all of the procedures used in the experiments, and summarizes all of the results.

Diagram 1 shows the setup used for the experiment. An Elephant Practice Ball was used for checking tip-contact points on the ball after each shot. Rulers were taped to the rails to ensure accurate aim on the first cushion and to measure the angle change due to sidespin at the second cushion. The cue was kept as level as possible during most of the tests and a consistent speed was used in all comparisons made. When doing comparative tests, it is very important to use as level a cue as possible to minimize swerve effects, and to strive for tip contact points at the same heights … ideally on the horizontal centerline of the CB. If a downward swoop is used or if the tip is aimed below center, bottom spin will be imparted, causing drag action on the cloth that slows the CB, without reducing the sidespin. This increases the effect of the sidespin and will widen the angle off the cushion. These effects are demonstrated in **NV F.2**.

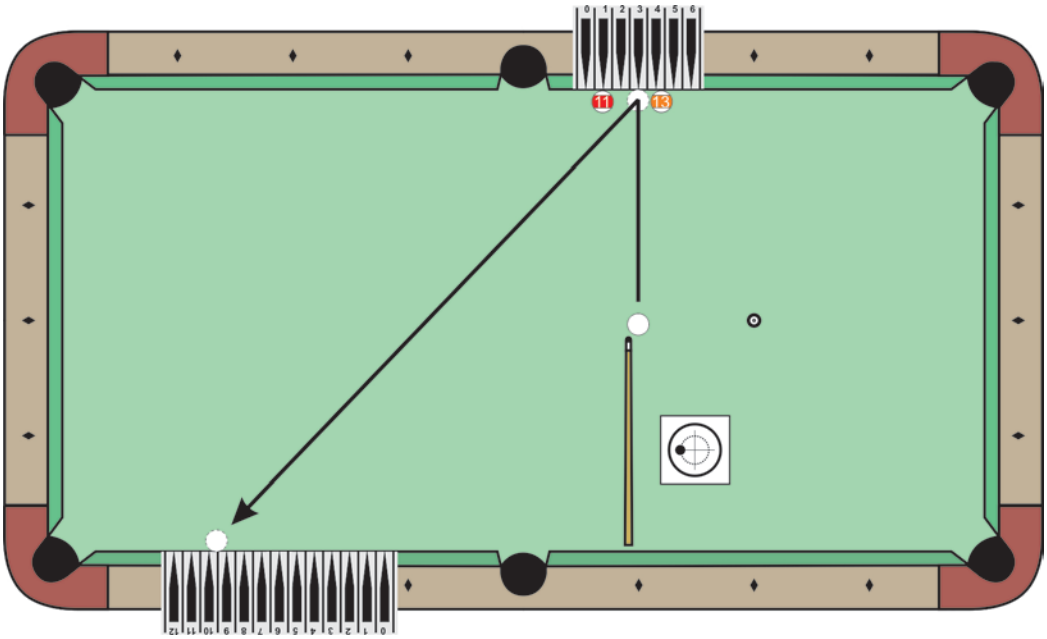

Diagram 1 Table setup for swoop experiment

In the experiment, I attempted to create as much spin as possible with both a swoop stroke and straight stroke. Again, the cue was kept as level as possible with each shot, with almost no clearance above the rail, and the goal was to hit the CB on the horizontal centerline as close to the miscue limit as possible. The 11 and 13 balls were placed to ensure an accurate hit on the first cushion. With an accurate hit, the CB narrowly misses the 13 on the way in; and with significant spin, the CB narrowly misses the 11 on the way out. Again, the main goal was to determine if more spin can be created with a swoop stroke as compared to a straight stroke. I threw out any attempts that did not have close to a horizontal-centerline hit on the CB, were not at a consistent speed, or did not hit the first cushion at the same spot. I also tested a high-squirt (large CB

deflection) cue with a soft tip to see if the results differed from a low-squirt (small CB deflection) Predator Z-2 with a medium-hard tip. I took 25-30 shots with each set of tests and only included the top four shots from each group in **NV F.2**. For comparison purposes, I decided to average only the two middle values of the top four with each set of tests, because they were a more-representative average of the best.

If you watch online video **NV F.2**, you will notice that the lines of aim for the low deflection (LD) vs. high deflection (HD) shafts and the straight vs. swoop strokes were different to create the same CB direction into the first rail. This is because the different amount of squirt (CB deflection) requires different aim compensation, and the swoop motion creates a slightly different effective line of action and spin for a given tip offset. The swoop effects are illustrated in **Diagram 2**. Both of these shots create the same effective tip offset and the same amount of spin on the CB. The CB also heads the same direction for both shots. With the swoop stroke, the cue is aiming more to the right at contact, and the actual tip offset from center is less as compared to the straight stroke. However, the sideways swooping motion effectively changes the direction of the cueing force, thereby creating a larger effective tip offset from center. With the straight stroke, the aim is slightly different, along the CB direction (ignoring squirt or CB deflection), and the tip offset from center is the same as the effective tip offset with the swoop stroke. Again both of these strokes result in the same CB direction and the same amount of spin.

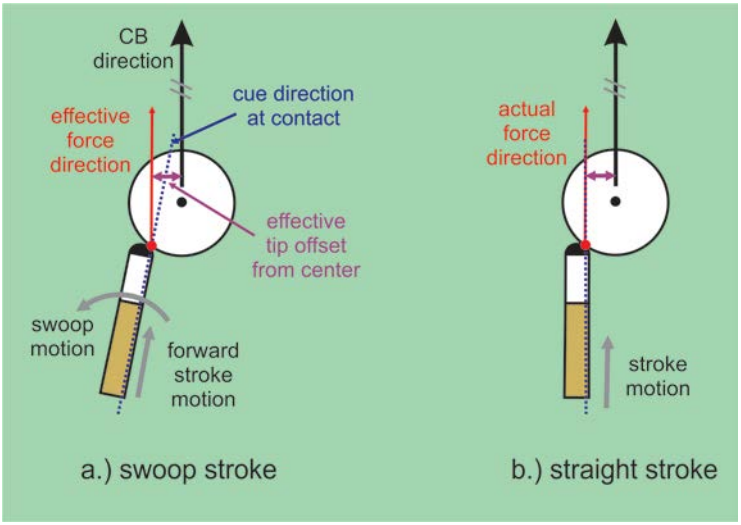

Diagram 2 Comparison of swoop and straight strokes

Table 1 summarizes the results of the experiment. First of all, the average amount of sidespin generated for the LD and HD shafts were pretty much identical (9.6 vs. 9.5), given the margin for error in the experiment. An LD shaft cannot create more spin, like some people think. (For more info, see "LD shaft - getting more spin" on the "cue" page in the FAQ section at ***billiards.colostate.edu***.) With the swoop stroke, I was not able to create quite as much spin as with the straight strokes (8.9 vs. 9.6). It should be possible to create the same amount of spin, but it is much more difficult to be consistent and accurate with the swoop stroke, especially when attempting to push the miscue limit. However, unlike some people think, a swoop stroke cannot create more spin than a straight stroke. As illustrated in **Diagram 2** and described above, for any swoop stroke, it is possible to create the equivalent shot of the same CB direction and same spin with a straight stroke.

Table 1 Results of swoop vs. straight stroke experiment

stroke type	shaft	position on second rail (amount of sidespin)	
		middle two of best four values	average
straight	LD	9.4, 9.8	**9.6**
	HD	9.4, 9.6	**9.5**
swoop	LD	8.5, 9.3	**8.9**

Now, for some people, there still might be some possible advantages to a swoop stroke. An alternative is to use back-hand english (BHE), where you align and aim center-ball and then pivot the cue before the final stroke (by moving the back hand with the bridge hand still) to apply the desired amount of sidespin. (For more information about BHE, see the videos and articles on the BHE resource page under "english" in the FAQ section at ***billiards.colostate.edu***.) If using BHE instead of a swoop, the pivoting before the stroke can be awkward, uncomfortable or unnatural to some people. For one, the pivoting points the cue in a direction different from where you want the CB to head (to compensate for squirt or CB deflection). This might not look right to some people. Also, the pre-stroke pivot can require a shift in stance while down on the shot, which some people might not like.

Some people prefer aiming center ball in the direction they want the CB to head, and then swoop during the stroke to apply english. If the bridge is at the correct distance from the CB (for the given shot speed, distance and conditions), and if the swoop speed is right compared to the forward speed of the shot, then the swooping motion will cancel CB deflection, and the CB will head in the desired initial cue direction. Also, as shown in **Diagram 2**, a swoop stroke allows one to hit the CB closer to center to create a larger effective tip offset. This might also be more comfortable for some people.

The main disadvantage of a swoop stroke is that it can be difficult to control; and, in general, the shot speed and amount of spin won't be as consistent and accurate. It can also be difficult to apply near maximum spin due to a greater risk of miscuing with less control. A straight stroke at the desired equivalent tip offset position, with appropriate aim, will be much more accurate and consistent for most people. And as the experiment showed, the swooping motion really provides no benefit in terms of spin generating capability.

Whichever method you use, you will always need to adjust your aim for different shots to compensate for the squirt, swerve, and throw that comes with using sidespin. For more information, see the english (sidespin) resource page in the FAQ section at: ***billiards.colostate.edu***.

Good luck with your game,
Dr. Dave


normal video

NV F.2 – Swoop Stroke Experiment - Can swooping create extra spin on the cue ball?

PS:

- For more information, and for results from additional testing, see the "chalk comparison resource page" in the FAQ section at ***billiards.colostate.edu***.
- I know other authors and I tend to use lots of terminology, and I know not all readers are totally familiar with these terms. If you ever come across a word or phrase you don't fully understand, please refer to the online glossary at ***billiards.colostate.edu***.

Dr. Dave is author of "The Illustrated Principles of Pool and Billiards" book and DVD, and co-author of the "Video Encyclopedia of Pool Shots (VEPS)," "Video Encyclopedia of Pool Practice (VEPP)," "How to Aim Pool Shots (HAPS)," and "Billiard University (BU)" instructional DVD series.