

The Volokh Conspiracy

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[[Eugene Volokh](#), May 15, 2009 at 3:56pm] [Trackbacks](#)

A Cool Visual Illusion:

The [Curveball](#). Thanks to Joe Doherty for the pointer.

FantasiaWHT:

[\(link\)](#)

Neat!

I find it interesting that you can look ANYWHERE else and you'll see the break.

5.15.2009 4:23pm

GD:

[\(link\)](#)

Would pitchers benefit from putting a dark spot (i.e., smudge of dirt) on the ball?

5.15.2009 4:28pm

rick.felt:

[\(link\)](#)

As a former undistinguished Division III pitcher, I can explain the illusion further:

Batters are taught to "look fastball and adjust." The idea is that you can always slow your swing down to compensate for the slower speed of a breaking ball, but if you're expecting a slower pitch and you get a fastball, the ball will be by you by the time you swing.

If you're expecting a fastball, you're expecting a pitch that travels on more or less a straight line from the release point to the plate. Because a curveball is slower, however, the pitcher needs to put some arc on it. So when you "look fastball" and get a curve, the ball is higher than you expect it to be when it leaves the pitcher's hand.

In other words, on a curve the ball is not where you expect it to be for the first 0.10-0.30 seconds. You're not looking directly at the ball during that time. It's as if you're looking at that blue dot instead of the ball. When your eye catches up to the true location of the ball, it appears to straighten out from its initial trajectory, like

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the gray dot appears to straighten out when you look from the blue dot to it.

5.15.2009 4:44pm

Splunge:

[\(link\)](#)

It's a nice illusion, but I doubt it has much to do with how things look to the batter in a baseball game. For one thing, the batter doesn't see the ball from above, as in this illusion. For another, a baseball isn't colored that strongly, and for a third, it rotates far faster.

I think the simplest explanation for why it's hard to judge the motion of something coming at you at high speed is, well, it's coming at you. You have very few cues, other than the slight increase in apparent angle subtended by the ball, to judge its coordinate along the axis parallel to the line between you and the pitcher. (Parallax is only useful within about 15 feet of the eyes, IIRC.) Hence deducing the component of its velocity along that line is intrinsically difficult.

5.15.2009 5:01pm

donaldek2 [\(mail\)](#):

[\(link\)](#)

I hope someone can help me to find a video showing the several pitches that are thrown. Curve, slider, etc Preferably both a top view, side view, and what the batter sees. Or, I would pay someone a good chunk of money to make one for me.

5.15.2009 5:05pm

rick.felt:

[\(link\)](#)

For one thing, the batter doesn't see the ball from above, as in this illusion. For another, a baseball isn't colored that strongly, and for a third, it rotates far faster.

Oh, but the batter does see the ball from above, sorta. The batter sees ball moves vertically, from a release point of, say, 6.5-7.0 feet above home plate, to 2-4 feet above home plate. And I assure you that, while you can't pick out each individual rotation on the ball, you can tell the difference between a ball that's rotating 6 o'clock to 12 o'clock (fastball) and a ball that's rotating 10 o'clock to 4 o'clock (right handed curve).

I hope someone can help me to find a video showing the several pitches that are thrown.

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The slider is really interesting to see. If thrown correctly, the axis of rotation passes directly through one part of the laces, and a bright red dot appears in the middle of the ball. It's formed by the slower rotation of that portion of the laces, relative to the blurred motion of the faster-spinning parts of the ball.

5. 15. 2009 5: 15pm

dave h:

[\(link\)](#)

A dark spot would probably help the batter, who isn't trying to actually watch the break of the pitch to see what type it is, but is looking at the spin. Usually you watch the seams - if they're tumbling end over end (and therefore mostly smeared out) it's a fastball. However, when the ball is spinning as in a curve, the batter sees a white dot where the seams never cross, since they aren't tumbling end over end.

At the end of course you're trying to judge how much a pitch is actually breaking, but the main recognition is just pitch type. That's why a "back up slider" can be effective (though rarely if ever thrown intentionally) - it looks like a slider but doesn't break.

Major league hitters may track the break more than I did (I was never a good hitter) but they still do generally the same thing.

5. 15. 2009 5: 19pm

rosetta's stones:

[\(link\)](#)

This reminds me of a good Hank Aaron story I once heard. Seems young Hank was just breaking in down in the minors, and the game was still mostly segregated, plenty of rednecks about.

So Hank steps up to the plate one game, and the pitcher yells "Hey Aaron, I got 4 of 'em right here for you!", and he fires the first pitch right at Hank's head, knocks him down. Next pitch, same thing. On the 3rd pitch, Aaron steps back in the box, jacks it over the fence, and trots around the bases.

The youngster gets back to the dugout, and naively asks his manager "Why's he so mad at me?". The grizzled old boy shakes his head and says, "Son, if you think he's mad now, just wait 'til you get up there NEXT time."

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Aaron broke into the minors batting cross-handed, if

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you can believe it.

5.15.2009 6:28pm

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