

Running head: BATTING AVERAGE AND APPARENT BALL SIZE

See the Ball, Hit the Ball: Apparent Ball Size is Correlated with Batting Average

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Baseball players frequently say that the ball appears bigger when they are hitting well. In describing a mammoth 565ft home run, Mickey Mantle said, “I never really could explain it. I just saw the ball as big as a grapefruit” (Ultimate New York Yankees, n.d.). George Scott of the Boston Red Sox said, “When you’re hitting the ball [well], it comes at you looking like a grapefruit. When you’re not, it looks like a blackeyed pea” (Baseball Almanac, n.d.). During a slump, Joe “Ducky” Medwick of the St. Louis Cardinals said he felt like he was “swinging at aspirins” (ESPNMAG.com, n.d.). Similar comments have been made by such Hall of Famers as Ted Williams (Roger Joslin, n.d.), “Wee” Willie Keeler (ESPNMAG.com, n.d.), George Brett (LA Article, n.d.), and more.

This phenomenon is not limited to baseball. When playing well, tennis players report that the ball looks huge, golfers say the cup looks bigger, and basketball players say the hoop looks enormous. All of these people report perceptions, which were modulated by performance efficacy. Our experiment confirms that this phenomenon is a psychological reality.

### Method

We recruited 47 players (37 male, 10 female) from men’s and co-ed intramural and city softball leagues. Ages ranged from 21-56. All participants gave informed consent.

We set up a table near the local softball fields in Charlottesville, VA, and advertised free sports drinks. Players who had just finished competing in 1 or 2 games were offered a drink and asked if they would like to participate in a 1-minute psychology experiment. First, participants selected the circle, on a 32cm by 42cm poster, which they

thought best corresponded to the size of the softball. Eight black circles, ranging (unsystematically) from 9cm to 11.8cm, were affixed to the poster. The actual size of a softball is 10cm.<sup>1</sup> After selecting a circle, participants reported how many times they were at bat, number of hits, walks, and times they got on base due to an error. Batting average was computed as the number of hits at bat divided by the number of times at bat that did not result in a walk or an error. We also got information on their age, sex, and whether their team won or lost.

### Results

The purpose of the experiment was to investigate whether there is a relationship between recent success at hitting and the perceived size of the ball. As is apparent in Figure 1, batters who hit well perceived the ball to be bigger. A Spearman rank-order correlation confirmed that there was a relationship between batting average and perceived size ( $r = 0.29, p < .05$ ). Age was not significantly correlated with perceived size ( $p > .64$ ). An ANOVA with perceived size as the dependent variable revealed a significant effect of sex ( $F(1, 45) = 10.09, p\text{-rep} = .97, d = .18$ ).<sup>2</sup> Males ( $m = 5.38, SD = 2.07$ ) perceived the ball to be bigger than females ( $m = 3.00, SD = 2.21$ ), although there was no difference in batting average ( $m = 0.65; m = 0.64$ ; respectively). There was not a significant effect on perceived size of whether they won or lost the game ( $p\text{-rep} = .03$ ).

### Discussion

Many athletes report perceptions that are influenced by their current level of performance. For example, baseball players say that the ball looks bigger when they are hitting well and smaller when they are in a slump. Our results confirm this phenomenon:

players who had just had success at hitting recalled the ball to be bigger than players whose recent batting average was smaller.

This finding is consistent with previous research showing that other perceived dimensions of the environment are affected by the perceiver's behavioral potential. Targets beyond hand's reach look closer when people hold a tool and can reach to the target than when they do not reach with the tool (Witt, Proffitt, & Epstein, in press). Wesp, Cichello, Gracia, and Davis (2004) demonstrated that dart throwing ability affects perceived size. Participants who hit the target with fewer attempts selected larger circles as matching the size of the target than participants who were not as good.

Similar research has demonstrated a relationship between the effort required to perform an action and the perception of spatial layout. Targets looked farther away when participants wore a heavy backpack (Proffitt, Stefanucci, Banton, & Epstein, 2003) or threw a heavy ball to their location (Witt, Proffitt, & Epstein, 2004). Hills looked steeper to participants who were fatigued after a long run (Proffitt, Bhalla, Gossweiler, & Midgett, 1995) and to participants who wore heavy backpacks (Bhalla & Proffitt, 1999). Participants who were out of shape or elderly and of declining health perceived hills to be steeper as well (Bhalla & Proffitt, 1999).

Unlike the previously reported experiments, participants in our experiment did not actually look at the softball when they made their size estimate. Therefore, it remains to be resolved whether our effects are due to a change in perception or to a change in memory.<sup>3</sup> If our effects are perceptual, the direction of causality is still undetermined. Did participants see the ball as being bigger, and therefore, hit better or do they hit better,

and therefore, see the ball as being bigger? Perhaps the effect is reciprocal with performance and perception affecting each other.

Pete Rose once described his philosophy on hitting as “see the ball, hit the ball” (SeeTheBall.com, n.d.). Seeing the ball well is thought to improve hitting performance. Our study shows that hitting performance, in turn, influences how big the ball appeared. Whether apparent ball size has a reciprocal influence on hitting performance remains an intriguing question.

## References

- Baseball Almanac (n.d.). Retrieved May 18, 2004, from <http://www.baseball-almanac.com/players/player.php?p=scottge02>
- Bhalla, M. & Proffitt, D. R. (1999). Visual-motor recalibration in geographical slant perception. *Journal of Experimental Psychology: Human Perception and Performance*, 25, 1076-1096.
- ESPNMAG.com (n.d.). Retrieved May 18, 2004, from <http://espn.go.com/magazine/vol5no11ichiro.html>
- Killeen, P. R. (2005). An alternative to null-hypothesis significance tests. *Psychological Science*, 16, 345-353.
- LA Article (n.d.). Retrieved May 18, 2004, from <http://www.shawngreen.net/articles/greenmachine.html>
- Proffitt, D. R., Bhalla, M., Gossweiler, R., & Midgett, J. (1995). Perceiving geographical slant. *Psychonomic Bulletin & Review*, 2, 409-428.
- Proffitt, D. R., Stefanucci, J. K., Banton, T., & Epstein, W. (2003). The role of effort in distance perception. *Psychological Science*, 14, 106-113.
- Roger Joslin (n.d.). Retrieved May 18, 2004, from <http://www.rogerjoslin.com/summaries.htm>
- SeeTheBall.com (n.d.). Retrieved May 18, 2004, from <http://www.leaguelineup.com/topnews.asp?url=linedrive&itemid=64801>
- Ultimate New York Yankees (n.d.). Retrieved May 18, 2004, from <http://www.ultimateyankees.com/MickeyMantle.htm>

Wesp, R., Cichello, P., Gracia, E. B., & Davis, K. (2004). Observing and engaging in purposeful actions with objects influences estimates of their size. *Perception and Psychophysics*, *66*, 1261-1267.

Witt, J. K., Proffitt, D. R., & Epstein, W. (2004). Perceiving distance: A role of effort and intent. *Perception*, *33*, 577-590.

Witt, J. K., Proffitt, D. R., & Epstein, W. (in press). Tool use affects perceived distance but only when you intend to use it. *Journal of Experimental Psychology: Human Perception and Performance*.

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Footnotes

<sup>1</sup>The mean circle size of the stimuli was larger than the size of an actual softball because pilot data revealed that pictures of objects look smaller than the objects themselves.

<sup>2</sup>For explanation of *p*-rep, see Killeen (2005).

<sup>3</sup>Wesp et al.'s (2005) study demonstrated that efficacy can affect perception since, in their study, the target was present when participants estimated its size.

Figure Caption

*Figure 1.* Apparent ball size as a function of batting average. Circles are drawn to preserve relative size.

Figure 1

