

Targeting for left eye-dominant righthanded bowlers

What C.A.T.S. revealed about the most effective targeting methods

Ocular or eye dominance is an important consideration for both coaches and bowlers. This is especially important in cross dominant situations in which the bowler's dominant vision is driven through the eye on the other side of the swing line. Clearly, this presents a problematic situation for accuracy in hitting intended target lines. Due to this reality, bowlers who are cross dominant will improve accuracy by altering how they target. But, how should a cross dominant bowler target for maximum effectiveness?

Eye dominance corresponds directly with handedness in 65 percent of the general population. In other words, if a person is righthanded, it is likely he will be right-eye dominant. Of the remaining 35 percent, crossed dominance only occurs in 18 percent of individuals. The rest are either non-dominant or only have one eye. By deduction, we can assume that approximately 1 in 5 bowlers will be cross dominant. In other words, their dominant eye is opposite of their

handedness or the ball they throw with on the lanes. (See tests on p. 32 to discover your dominant eye).

Discussions on eye dominance and targeting are not new in the world of sport. Particularly in shooting sports, line of sight alignment and choosing a specific shooting hand are well documented. But, very little research has explored the effectiveness of specific targeting method of bowlers with eye dominance that is opposite of their handedness.

For example, what targeting method would be most useful for a righthanded bowler who is left-eye dominant? Would closing the non-dominant eye improve accuracy? Would simply shifting your visual target to compensate for missing toward the dominant eye be most effective? Or, would targeting longer improve target proficiency?

Historically, many coaches have advocated simply looking further to the right to compensate for left-eye dominance. But, is this simple adjustment the most effective to improve accuracy?



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In this issue of Slowinski at-large, I share with readers a research project on left-eye dominant righthanded bowlers and the effectiveness of various targeting methods. The findings from this study reveal some important evidence that bowlers with left-eye dominance can improve their accuracy significantly by altering how they target.

The hypothesis

The genesis of this research came from reflections on improving targeting accuracy for bowlers. As a coach, I often work with righthanded bowlers who are left-eye dominant. Consider the reality that the difference between the left and right pupil is nearly 2.5 inches. Since a left-eye dominant, righthanded bowler has a significant difference between the left-eye driving vision and the swing line, the closer the target is to the bowler, the less accurate they will be in regard to hitting a target they are attempting to hit. Accordingly, I hypothesize that a left-eye dominant, righthanded, bowler will improve their target accuracy by looking further down the lane.

The method

All bowlers on an elite college bowling team tested their eye dominance with a well established method. These bowlers included members of several national teams. Bowlers were instructed to extend their forearms in front of them, closing the line of vision between both thumbs and index fingers. The objective was to narrow the sight area between the overlapping index finger and thumb to a very small window, looking at the writing on the masking unit. Bowlers then closed each eye. Those who saw the same image when the right eye closed were left-eye dominant. After measuring eye dominance, eight bowlers were determined to be left-eye dominant. The number of bowlers who are

left-eye dominant represents nearly 25 percent of the entire team and 33 percent of the men's team. Seven of these eight were available to participate in the project.

Participants were provided with ten minutes of warmup on a fresh test pattern. All left-eye dominant, righthanded bowlers, were tested on the U.S. Open lane condition, a 40 foot flat 1 to 1 lane pattern. After the warm-up period, bowlers completed a 10 shot Computer Aided Tracking System (C.A.T.S.) analysis to establish a target accuracy baseline. The bowlers used their normal targeting methods. All of the bowlers had previously been trained in 3-point targeting with quiet eye.

After the first C.A.T.S. test, bowlers were instructed on how to target with the second targeting method. Specifically, the bowlers were asked to target with their normal alignment process, but to also close their right eye through the entire approach. The goal was to test targeting consistency with only the dominant eye. Bowlers were provided with several shots to become familiar with the different targeting process. After the short warmup, bowlers completed the second set of 10 C.A.T.S. shots.

Finally, in the third method, bowlers were asked to target down the lane, at the exit point. The goal was to evaluate the hypothesis. Specifically, will targeting longer down the lane help the left-eye dominant bowler be more accurate in hitting their target lines? The exit point for a specific pattern is determined by subtracting 31 from the pattern length. The exit point

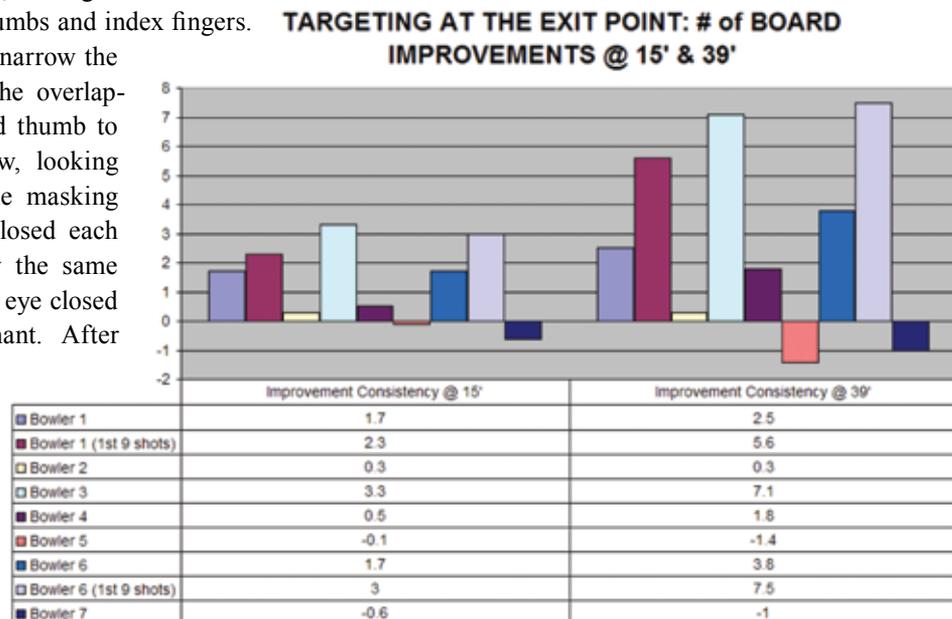


Diagram 1

will literally be the board at the end of the pattern. Specifically, in regard to this pattern, bowlers were asked to look at board 9 at 40 feet (i.e., $40 - 31 = 9$). Once again, the bowlers were given a few shots to become familiar with this targeting process. After the short warmup, bowlers completed a 10 shot C.A.T.S.

The three individual C.A.T.S. reports for each bowler were collected and analyzed. (see Diagram 1)

The results

With a review of the data and subsequent analysis, several important findings provide left-eye dominant bowlers some hope to improve their targeting accuracy.

First and foremost, the most revealing fact that emerged from the data analysis was targeting longer improved accuracy for nearly all of the bowlers. Specifically, when the left-eye dominant righthanded bowlers targeted at the exit point, they realized significant improvement in three areas, compared with their normal targeting method: (1) target accuracy at 15 feet, (2) target accuracy at 39 feet and (3) ball speed consistency.

Seventy-one percent, 5 of 7, of those in the project improved their accuracy at both 15 and 39 feet compared with their normal targeting methods. The improvement in accuracy consistency ranged from 1.7 boards to 3.3 boards at 15 feet and from as much as 6.1 boards at 39 feet. Of the five bowlers who improved accuracy, three of these bowlers improved significantly at both 15 and 39 feet. Accounting for one bad shot, each on the tenth shot, revealed that two of the bowlers had an improvement in consistency of 5.6 and 7.5 boards at 39 feet.

On a note of interest, 85 percent, 6 of 7, of the participants improved their ball speed consistency when targeting down the lane at the exit point. Ball speed consistency improved from .06 mph to .46 mph more consistent.

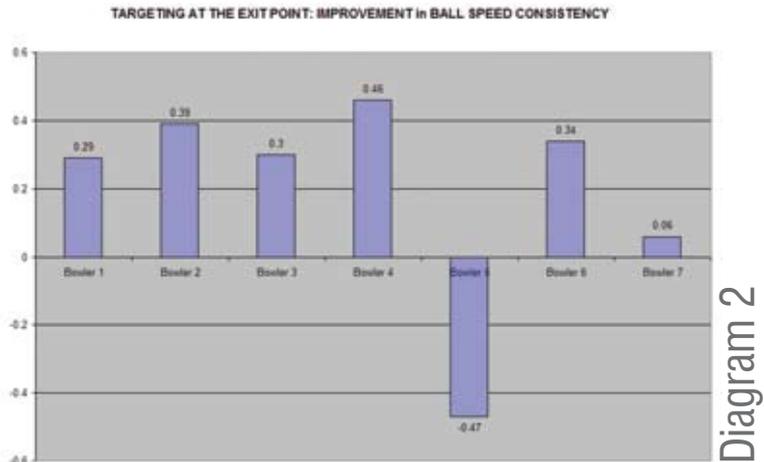


Diagram 2

But, 5 of the 6 improvements were .29 to .46 mph more consistent. Think about that number. By targeting at the exit point, most of the bowlers improved their consistency by as much as one-half a mile an hour. Better ball speed consistency leads to better and more consistent ball motion. (see Diagram 2)

Targeting with the non-dominant eye closed was the least effective method for six out of seven bowlers. This finding demonstrates the importance of both eyes in depth perception and normally targeting process. The one exception to this finding was a bowler who normally targeted at the foul line. When this bowler targeted, closing his right eye, his accuracy improved by nearly 1 board at 15 feet and 1.5 boards at 39 feet. However, his ball speed consistency was less effective than his regular targeting method. And, this was the most effective targeting method for him. It was





an improvement over his normal targeting method. In certain cases, this will be an appropriate option to explore for those who target at the foul line.

Discussion

This research project on targeting and eye dominance revealed that targeting at the exit point provides an excellent alternative for a left-eye dominant right-handed bowler. As the findings revealed, targeting at the exit point can significantly improve their accuracy as well as ball speed consistency.

When a left-eye dominant righthanded bowler targets at the exit point, the visual difference between the swing line and the line of sight of the eye driving vision is significantly smaller than when the bowler targets closer to the foul line. Consistent with the hypothesis, it revealed that this would lead to improvement in accuracy down the lane. Accuracy down the lane leads to improvement in consistency in the front part of the lane as well.

As for the unique case of the bowler who normally targeted at the foul line, he was able to get to pro level consistency by keeping his right eye closed through the approach. Since he normally targets at the foul line, he is normally missing inside. Recall the fact that the distance between eyes is approximately 2.5 inches. Consequently, the eye that is driving vision is normally three boards inside of where the ball will pass,



Triangle Test

at the point of release. His normal miss at the arrows has been 4 boards left. And, this was revealed in his normal visual adjustment of looking to the right.

Multiple methods of finding eye dominance

Here are a few different eye dominance tests that you can use to identify your dominant eye. If you are left-eye dominant, your targeting method can be improved. But, test yourself to make certain you know.

1. Tube Test

- a. Place the tube in front of you with both eyes open. Spot a specific object.
- b. As you are viewing the object, close your left eye. If the object disappears, you are left-eye dominant.

2. Triangle Test

- a. Create a triangle by overlapping your thumb and index fingers of both hands.
- b. Extend your arms in front of you peering through the triangular opening in your hands.
- c. Similar to the tube test, create a small visual window and close-in on a specific object.
- d. As you are viewing the object, close your left eye. If the object disappears, you are left-eye dominant.

3. Cut-Out Test

- a. Take a 8 1/2 x 11 piece of paper and cut a 1 inch square out of the middle.
- b. Extend your arms with your hands on the side, placing the piece of paper in front of you.
- c. With both eyes open, spot an object in the window.
- d. As you are viewing the object, close your left eye. If the object disappears, you are left-eye dominant.

References

Portal J.M. & Romano P.E. (1998). *Major review; ocular sighting dominance: a review and a study of athletic proficiency and eye hand dominance in a collegiate baseball team*. *Binocul Vis Strabismus Q* (13):125-32.

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