The VAR-E System

Changing axis rotation to change ball motion

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Over the last 20 years, the bowling community has continued to become an equipment obsessed and bowling ball consumption oriented culture. Every day on social media you see bowlers zealously sharing their enthusiasm for new bowling balls. As a coach preparing players and teams around the world for tournaments, I understand the essential elements associated with equipment and achievement. To be successful at the highest levels, you need to strategically combine the technology of bowling balls with skill.

This sentiment was recently echoed by PBA Hall of Famer Amleto Monacelli in his interview after winning the PBA50 Pasco County Open in April, “…back in the 80s when I was bowling on tour, I was a ‘feel player’ and I could make the equipment I happened to be using work….But now you just can’t totally rely on your skill… You have to combine the skill with good knowledge of the bowling ball and how it reacts with the lane conditions.” To be successful in bowling, a bowler must match equipment with ball motion manipulation skills.
I am a strong believer in using specific layouts with specific covers and cores to create shape matchups that help bowlers be successful on sport conditions and through the phases of transition. I am concerned, however, that bowlers rely too much on reaching in the bag to change colors rather than learning and implementing release variation skills.

Ball motion manipulation via release change leads to a substantial growth of one’s arsenal. If a bowler can attain releases that include four axes of rotations, two axes tilts, two rev rates, and three ball speeds, this player can make one ball create 48 shape variations (4 x 2 x 2 x 3). An arsenal of six balls is converted to an arsenal of 288. In an effort to aid bowlers in being able to more easily create ball motion variation, I present the VAR-E (Vary Axis of Rotation Easily) axis of rotation system.

**Introduction to VAR-E**

Historically, most teachings associated with axis of rotation change have centered on the fingers, thumb, or a combination of both. Much of the discussion was focused on the pinky and ring finger in the setup, suggesting the release will miraculously be completed without much focus at the release point. In my opinion and experience, much like a baseball pitcher changes motion, creating ball motion variation is a combination of the hand position at setup and a concerted focused movement at release.

A world-class release has the palm forward. Biomechanically, this is a function of the body position and swing path. Ideally, the index finger and its pad should be directly forward toward the pins. This places the ring and middle fingers to the inside of the ball.

The release initiates when the hand/palm starts to rotate while the fingers and thumb are still in the ball. Soon after the rotation has begun, the thumb exits and the palm/hand continues to rotate counter-clockwise. After the thumb exits, the palm continues to turn to the end point where the fingers exit the holes.
I have found it easier to teach axis of rotation variation by focusing on the center of the palm as compared with teaching it referencing the fingers and thumb. With VAR-E, the key to altering ball motion easily is to envision a clock face relative to the center of your palm.

To change axis of rotation, the bowler will rotate the center of the palm to the desired time on the clock. For right-handed players, the center of the palm will end at a time between 9:00 and 12:00. The left-handed player will focus on an ending time between 12:00 and 3:00.

By focusing on the center of the palm, a bowler will more easily control how much they move their hand from the release ignition point to when the fingers exit the hole. This presents a “visual”
reference in the mind which will lead to both increased variation possibility as well as more consistency. As is seen in the graphics, each 30 minute segment represents a change in axis of rotation of 15 degrees.

<table>
<thead>
<tr>
<th>Axis Rotation Angle (deg)</th>
<th>Description</th>
<th>RH</th>
<th>LH</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>None</td>
<td>palm to 12</td>
<td>palm to 12</td>
</tr>
<tr>
<td>15</td>
<td>Low</td>
<td>palm to 11:30</td>
<td>palm to 12:30</td>
</tr>
<tr>
<td>30</td>
<td>Medium low</td>
<td>palm to 11</td>
<td>palm to 1</td>
</tr>
<tr>
<td>45</td>
<td>Medium</td>
<td>palm to 10:30</td>
<td>palm to 1:30</td>
</tr>
<tr>
<td>60</td>
<td>Medium high</td>
<td>palm to 10</td>
<td>palm to 2</td>
</tr>
<tr>
<td>75</td>
<td>High</td>
<td>palm to 9:30</td>
<td>palm to 2:30</td>
</tr>
<tr>
<td>90</td>
<td>Very high</td>
<td>palm to 9</td>
<td>palm to 3</td>
</tr>
<tr>
<td>Back up</td>
<td>Inside out</td>
<td>palm to 12:30/1</td>
<td>palm to 11:30/11</td>
</tr>
</tbody>
</table>

An excellent starting release position begins with the palm at 12:30 or 1:00 for righthanded players and 11:30 or 11:00 for lefthanded players. This visual concept of the palm into release will help you simultaneously evaluate your release position as well as achieve it more often.

**Reconceptualization of the release to follow through**

The release to follow through motion should be thought of as a vector with magnitude and direction. For example, velocity and acceleration are both vectors. To better comprehend this vector idea, think of the release to follow through as a four dimensional entity.

There are three possibilities associated with direction – lateral (X axis), vertical (Y axis), and horizontal (Z axis) directions. For the magnitude component, the release to follow through has angular acceleration. To maximize energy transfer from bowler to bowling ball, to increase rev rate, and to increase launch angle accuracy, the release to follow through should be vertically down and horizontally long. This will also increase angular consistency since the hand will travel on the target line longer.

I use the concept of keeping the hand under the elbow from release to follow through, to help a bowler extend horizontally. By moving vertically down and horizontally long, a good wrist position will also move from wrist flexion (cupped) to wrist extension (unloaded) increasing the rev rate.

To better achieve the VAR-E system, focus on making your release to follow through horizontally longer. Since the fingers will remain in the ball longer, this provides more consistency realizing the desired ending close position.
Using VAR-E to improve spare shooting

VAR-E can also help bowlers improve spare shooting consistency. First and foremost, by focusing on the 12:00 position of the palm from release to follow through, a player will be able to reduce their axis of rotation angle and approximate zero degrees.

In addition, I recommend experimenting with throwing a back up ball for specific spares and combinations. To achieve a back up ball motion, focus on moving the center of the palm at release to 12:30 or 1:00 for righthanded bowlers and 11:30 or 11:00 for lefties. Spares such as the 10, 6/10, 3/6/10 and 3/10 can be more effectively converted with the ball traveling slightly from left to right (less likely to chop). Moreover, the likelihood of converting the 1/2/4/10, 2/10 and 2/8/10 improves with a back up.

Evaluate your implementation of VAR-E

Step 1

Mark your PAP on a ball. If you don’t know how to mark your PAP, your pro shop operator or coach can help. If you don’t currently have access to your pro shop or coach, please see "How to Mark Your PAP" for a simple alternative method for marking your PAP.

How to Mark Your PAP

Sometimes, we don’t have access to the typical pro shop tools that are used to mark a bowler’s PAP. Below is an alternate approach that will allow you to accurately determine your PAP using just two bowling balls and a grease pencil. Grease pencils are available through some online pro shops, or they are often sold as "china markers" at office supply stores for about $10 (USD) for one dozen.

1. Throw one shot in a part of the lane that has sufficient oil in the heads.

2. Mark the first oil ring with the grease pencil, from above the fingers to below the thumb. The first oil ring is typically the one closest to the thumb.

3. Place the ball on the approach and align the marked oil ring such that it is aligned with the edge of any board when viewed directly from above, as shown in the below image.

4. Place a second bowling ball on the side of the ball closest to the gripping holes, directly next to the first ball (i.e. both balls must be the same distance from the foul line).
5. The point where the two balls touch is the PAP. Mark the PAP with a piece of tape at this location.

6. Throw the ball again to verify that this is your PAP by making sure that the tape is “stable” at the release point. Adjust the position of the tape, as necessary. A “stable” piece of tape at the release point indicates that the ball is rotating about the point marked by the tape, which indicates that the marked point is the PAP.

**Step 2**

Once your PAP is accurately marked, implement the VAR-E axis of rotation change system and determine what the actual axis of rotation will be for you when trying the system. With two shots per frame, it will take approximately four games to complete the evaluation.

Take ten shots with each palm movement and estimate your actual axis of rotation. Use video to be more accurate. When you review and analyze the video, record the axis of rotation degree value on each shot. At the end of each ten shots, find the average axis of rotation degree for that release. Also, make note of the ball motion achieved with that release.

If you practice with a team, coach, or partner, have them help with degree observation. Evaluate yourself each month to see if you are improving in making the release happen as well as being consistent with its production. Use each monthly evaluation session as an assessment of your specific ball motion manipulation.

**Resources**

The following printable worksheets can be used to record your VAR-E implementation

http://www.bowlingthismonth.com/article/the-var-e-system/
Recap of the Vary Axis of Rotation Easily (VAR-E) System

Step 1
Visualize a clock face from 9:00 to 3:00. The hours are relative to the position of your palm (i.e., the direction the palm is facing). This should be conceived of as the direction at the starting and ending point of the release (fingers leave the ball).

Step 2
To help visualize the release clock mentally, move the palm slowly from the 12:00 position smoothly and slowly to the 9:00 position. For the lefthanded player, think of the palm moving from 12:00 to 3:00. As your hand moves along the clock face, focus on “seeing” 11:30, 11:00, 10:30, 10:00 and 9:30 as well. For lefthanders, “see” 12:30, 1:00, 1:30, 2:00 and 2:30 as you pass these times with the center of the palm.

Step 3
Visualize the ending location. Pick specific axis of rotation degree ending locations and practice stopping the center of the palm at that time location.

Step 4
On the lanes, decide which axis of rotation you want before stepping up on the approach. Visualize your hand rotating from palm up (12:00) to the desired clock face stopping location. Just before stepping up on the approach, complete two practice swings with your hand changing locations from palm up to the actual ending location you want. Make sure the hand travels a long horizontal distance as you are moving the palm. The palm should rotate continuously and smoothly as the hand moves from start to end.

Quick note on the index and pinky in the set up
The index finger and pinky should be thought of altering the weight distribution of the ball in the hand. For example, having the pinky close (adducted) to the middle but the index finger away from the middle finger (abducted) moves the weight distribution to the outside of the hand acting to rotate around the ball slightly more.
If the player wants to go to 11:00 (30 degrees), then the final degree will actually be more than 30 degrees. Conversely, if the pinky is out and the index in, the actual release would be less than 30 degrees. The utilization of the index and pinky finger can make small adjustments to the release with the palm turning to a specific ending location.

Closing remarks

From my experience teaching the VAR-E system, it is an elegantly simple way to achieve complex axis of rotation variation with relative ease. With a focus on the center of the palm and the rotation of this center to a specific location, you can quickly learn to change axis of rotation.

About Joe Slowinski

Joe Slowinski, a USBC Gold Coach, is currently on assignment in Europe. The Portland Maine native served as the Administrative and Men’s Head Coach at Webber International University and served for four years as a Master Teaching Professional at the Kegel Training Center. Slowinski is the former Director of Coaching and Coach Certification for the National Sports Council of Malaysia. Joe’s personal coaching website is www.bowlingknowledge.info.