Can the ADI and/or the VMI determine Win and Loss, Game by Game?

by Clifton Neeley www.baseballvmi.com

So, since we are making a big deal of the ADI and the VMI, how do you, as a user include it into your analysis to help you win in the game of daily fantasy and/or add it to your decision making process? You may have noticed that on our website, we have stated that our strength is not in the win-loss arena, but indicating a high probability of above average number of hits vs below average number of hits in today's games. Although we are working on identifying individual performance, we are not there yet. The tendencies that are identified pretty distinctly by the amount of comfort with today's movement on each pitch are significant, but all of the best historical metrics are still in play. Your challenge, as well as ours, is to mix the ADI and the VMI into your individual decision making process to come out with the world's best formula for predicting individual and team performance. So the answer to the above question is obviously--'No, not by itself.'

Since we can divide MLB data into performance categories that show how much ball movement the pitcher had purely from the makeup of the air, we can see the pitcher's performance against the ADI. We can also see the hitter's performance when the ball is moving more and when the hitter is not used to the movement vs when he is comfortable in the climate. It gets very intriguing when we include different types of pitches within that same grid. You can do a similar study on the pitcher and hitter stats on our website, but you may glean some good information from our study on the "Pitch-Mix." The aspect of this study which most intrigued me when I first began was that we are entering the realm of an industry which is over 100 years old. We are sandwiching a concept of gauging the air (which is older than Methuselah) into modern cyber metrics to see if there are identifiable trends that parallel baseball common sense. Since the trends are evident, we are combining the physics to the mental and physical makeup of the most talented professionals in the world and what we are beginning to see is that performance against the type of pitch is substantially related to the ranges identified by the ADI and particularly the VMI.

Visual Memory by Clifton Neeley, creator of the Visual Memory Index© and author of the web-site www.baseballvmi.com. Clifton pitched and played baseball and fast-pitch softball in the mountainous southwest Colorado area from 4,000 feet in Grand Junction to 6,000 feet in Durango to 9,000 feet in Telluride prior to his college experience in baseball.

Air Density	Heavyweights	Welterweights	Lightweights	Featherweights	Bantamweights
Neeley Scale	70's ADI	60's ADI	50's ADI	40's ADI	30's ADI
95mph 4-Seam	7 inches Lift	6 Inches Lift	5 Inches Lift	4 Inches Lift	3 Inches Lift
	9 Inches Tail Off	8 Inches Tail Off	7 Inches Tail Off	5 Inches Tail Off	4 Inches Tail Off
95mph 2-Seam	4 inches Lift	3 Inches Lift	2 Inches Lift	2 Inches Lift	1 Inches Lift
	11 Inches Side-to-Side	10 Inches Side-to-Side	9 Inches Side-to-Side	7 Inches Side-to-Side	6 Inches Side-to-Side
85mph Curve	14 inches Downward	14 inches Downward	13 inches Downward	11 inches Downward	11 Inches Downward
	7 Inches Side-to-Side	6 Inches Side-to-Side	5 Inches Side-to-Side	3 Inches Side-to-Side	2 Inches Side-to-Side
90mph Slider	8 inches Downward	8 inches Downward	7 inches Downward	6 inches Downward	6 Inches Downward
	6 Inches Side-to-Side	5 Inches Side-to-Side	5 Inches Side-to-Side	3 Inches Side-to-Side	2 Inches Side-to-Side
95mph Cutter	6 inches Downward	6 inches Downward	5 inches Downward	4 inches Downward	4 Inches Downward
	9 Inches Side-to-Side	8 Inches Side-to-Side	7 Inches Side-to-Side	5 Inches Side-to-Side	4 Inches Side-to-Side
90mph Sinker	9 inches Downward	8 inches Downward	7 inches Downward	6 inches Downward	5 Inches Downward
	0 Inches Side-to-Side	0 Inches Side-to-Side	0 Inches Side-to-Side	0 Inches Side-to-Side	0 Inches Side-to-Side

Putting a Microscope on Pitches Using the ADI and VMI

The 2016 League-Wide Average Hit/Strike Rate for All Pitch Types Combined Was...9.36%

The ADI provides a microscope on the pitcher. The VMI provides at least a telescope on the hitter.

Which Pitches favor the pitcher in *Heavy Air* and which in *Light Air*?

The pitch-mix is defined by the combination of the varied types of pitches thrown versus what the team of hitters should be set up and prepared to hit best. Obviously, a good pitch-mix ends in success for the pitcher; a bad pitch-mix winds up with a man on base or worse for the pitcher's team. As you know, pitchers in MLB, college, and even high school utilize several pitches to keep the hitter off-balance. In MLB, the typical starting pitcher needs to utilize three pitches at a very high level of movement, angle and accuracy to be successful. Some pitchers are able to effectively throw six pitches, but that is rare.

The Visual Memory Index is built around the primary pitch in baseball; i.e. the Four-Seam Fastball. This is the most frequently used pitch in the league and most likely the same in any baseball or even fast-pitch league. It is identified by backward spin with the four longest seams of the ball traversing horizontally through the air. A similar pitch in fast-pitch is called a Rise-Ball, as both achieve upward lifting movement, although thrown underhand instead of overhand. This pitch is used to set up the hitter for other pitches, which can keep the hitter off-balance. The second most used pitch in MLB is the Slider. The third most frequently used pitch is the Two-seamer, the fourth is the Change-up, and the fifth is the Curveball. Another very effective pitch is the Sinker, which we will discuss later in this segment, along with the Splitter, the Cutter, the Knuckle Curve and the Knuckle Ball.

Of course, each pitcher has unique arm action, speed and release aspects that make the game more exciting and less predictable however, the trajectory itself is caused by the extremely variable air pushing against the cover and the seams on the ball within the more consistent gravitational pull. We will look at the data on each pitch as it relates to the atmosphere identified by the ADI and the performance within it as tracked by the VMI. We will discuss how you as a player, fantasy participant, manager, or wager participant may benefit from this information.

The objective of this discussion is to help you gain insight into ***"when"*** a certain pitch will be more effective. If you know the VMI, then you know the hitter's set-up tendency for today, and you will have a clearer picture of the hitter's capability to adjust to a particular pitch. For example, if the Four-Seamer is lifting 6 inches from a straight line today at a 65 ADI as shown on the chart, but the hitter is used to that amount of movement and sports a +4.00 VMI today, then the following should be a tip for you, or the pitcher, or catcher: This hitter may be more susceptible to being induced into a groundball with the two-seamer. This is because his set-up is above the four-seamer instead of below it and the two-seamer lifts less than the hitter is expecting. I will present a discussion about the two-seamer in ensuing articles.

Four-Seam Fastball - Used (36%) League Wide

Average Hit/Strike Rate For 2016 = 8.97%

Bottom Line: Pitchers will be more successful against a team with a high minus VMI (greater than -5.00) than when the team sports a "Plus VMI of 5.00 or greater."

This most frequently used pitch, about 36% of all pitches thrown, is designed to lift over the hitter's bat. It is accomplished in three ways: 1) by speed' which, (of course) flattens the trajectory and provides the hitter little time to adjust; and 2) by backward spin rotation, which causes the ball to lift as it travels and 3) the backward spin being canted due to the arm-slot (or angle) so that upon release, the trajectory includes an additional action called tail-off, which adds a sideward movement. [***If you are a player or manager; then, I am aware you know this.]***

TIP: When utilizing our database, you will notice that we provide you with VMI increments to choose from. For example, if you wish to check out how a team has performed against the four-seam fastball *when* the pitcher has more movement than your team is used to seeing, you may want to select an increment of 4.00 on the VMI range. Since the 4-seamer was used to create the index, then 4.00 (plus or minus) represents approximately 1/2 inch of movement different from the hitter's recent experience against a typical 95 mph

pitch. An increment of 2.00 would then represent approximately 1/4 inch differential and 8.00 represents as close to one full inch of movement differential as possible. Keep in mind that the additional pitches that a pitcher may utilize will not necessarily fall into such an equally divided increment system. However, once you have utilized the chart that you will find below, you will soon be able to associate the VMI range with the amount of movement on each of the pitches a starter may typically throw. Of course, the speed of the pitch is important, but we use the actual production against each individual pitcher's data, so this naturally includes his typical speed and his accuracy within the environment defined by the game-day ADI. In each of the following articles, we will go through the balance of the pitches used by most pitchers. To be continued……

Clayton Kershaw's Repertoire Makes Him a "Tight Pitcher"

by Clifton Neeley www.baseballvmi.com

Slider - Used (15%) League Wide

Average Hit/Strike Rate For 2016 = 8.37%

The slider is essentially a curveball that is thrown at a higher speed and therefore has lesser rotation in terms of rpm's. Due to its speed, it is a later breaking pitch than the curveball. In heavy air, this pitch breaks even sooner on its path toward the strike zone than it does in lighter air. In **very light air** it breaks much further down the path of travel and becomes a devastating pitch in the arsenal of the high speed pitcher. A pitcher typically likes to place this pitch low, outside and off the plate, especially when he is ahead in the count. It is a good counter pitch to the four-seamer due to its speed. It is thrown approximately 15 percent of the total pitches thrown in Major League Baseball and could be the "out" pitch for some pitchers. We, here at Baseball VMI, have identified a pitcher who throws the four-seam fastball more than 30% of the time and also the slider more than 10% of the time, as a "Tight Pitcher"--that is, one who normally conforms to the top three utilized pitches in MLB. A good example of a "Tight Pitcher" is Clayton Kershaw. He primarily throws three pitches. The main one is his fastball, but he sports a great slider to go along with it, plus, of course, his timely change-up. We'll talk about the "Tight Pitcher" in a later article sometime this season.

Two-Seam - Fastball Used (14%) League Wide

Average Hit/Strike Rate for 2016 = 11.14%

The two-seamer is simply a pitch thrown with the ball rotated 90 degrees from the 4-seam grip position. Since there are only two short seams spinning backward, the lift is less than when four seams are whipping the air. Also, due to the typical 75% to 80% arm angle of the pitcher, the circular seams acting against the air cause a Frisbee© effect, sliding the ball in the direction of the slant. This pitch is used approximately 14% of the time in MLB. It is normally used by a 4-seam dominant pitcher (tight pitcher) to induce a groundball knowing that this pitch does not lift as much as does the 4-seam.

"When" is an extremely important point in this particular discussion. This is also "*when*" the VMI comes in handy for you. But before we get into the discussion about the two-seamer, let's set a few ground rules; First, we are talking about the two-seamer after the hitter has been set-up by the pitcher's four-seamer. Second, we are talking about a 95 mph pitch, and third, we are assuming the pitcher is not struggling to hit his preferred location within the strike zone due to an extreme change in atmosphere.

So, let's assume a team of hitters has recently been hitting in an environment and weather that has caused the four-seamer to lift less than it will lift in today's game, the team will sport a Negative VMI.

Let's say the VMI is -4.00 or minus even greater, then these hitters are used to setting their bodies to swing at a pitch that is lifting 1/2 inch more than it will today. So if the typical "Tight" pitcher uses the 2-seamer, it will be right on the target of the hitter who may not need to alter his swing at all to pound that pitch.

Now, don't get confused "when" speed is considered. Always keep in mind that a speed of 5 mph less than the 95 we are featuring, will take one inch off the lift of that 4-seam fastball regardless of the environment. So, if your pitcher throws a 4-seamer at only 90 mph, then of course he will get hit much harder even at a (minus) -4.00 VMI. And, if he is substantially slower, then the two-seamer will actually be more effective within this VMI range.

You can quickly check a starting pitchers' production in the ADI and against the hitters' VMI for today by going to www.baseballvmi.com and selecting Members (you don't need a membership to look at the stats) then selecting "Pitcher Stats by ADI" and checking the "Sortable Stats" for the teams' normal performance in the VMI Range. Once you've recorded the Pitcher and the Team, then check the individual Hitter and Team Stats against the VMI Range to see what is the pitch he's most likely going to be able to square up on "Today."

The Two-Seam fastball as a leading pitch is dangerous for the pitcher against any minus VMI team. Of course, it is less dangerous for the pitcher if he is pitching in a High ADI game due to the side-to-side movement. In a low ADI environment (like Kansas City in the hot summer) the two-seamer may work well, depending on the opposing teams' VMI for today.

Next time we'll look at the "Reverse Pitcher" and how you can quickly decide if he's in trouble before the game begins.

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"Reverse Pitcher"

If you note that the pitcher your hitting team or player is matched up against (in today's or tomorrow's game) is prone to throwing a high number of two-seamers, then he will be more successful against a High Plus VMI team than a High Minus VMI team with that pitch. We, at Baseball VMI, have identified a pitcher who throws more 2-seamers than 20% of his pitches as a "Reverse" pitcher. A Reverse pitcher is one who throws a downward breaking Two-Seamer, Sinker, or Cut Fastball above 90 mph as one of his primary two pitches. So, a High Plus team will be more successful against a Tight Pitcher and a High Minus team will be more successful against a Reverse Pitcher.

While a manager cannot change starting pitchers due to a VMI match-up, a "Reverse Pitcher" should not be called upon as a reliever for a team that sports a High Minus VMI. "When" is crucial to a pitcher's success. If you look at the production rate of pitchers when the VMI is high negative in our database, you will see the hit percent elevated on both the two-seamer and the sinker. This is a direct result of the distance a hitter must reach as he adjusts to hit the downward angling two-seam and sinker (both reverse pitches) in the high velocity ranges when he has set up for the four-seamer. If the hitter happened to guess right and was expecting a sinker, for example, then he would have a higher hit rate, but that is an inconsistent way to play baseball and players know better than to try to out-guess the pitcher very often.

Change-Up - Used (10%) League Wide

Average Hit/Strike Rate for 2016 = 9.98%

The change-up is obviously an off-speed pitch which is a timing nightmare for the hitter. It is generally more effective when the high velocity pitches are being hit hardest. However, the air resistance on such a slow pitch does not appear to be a factor in its effectiveness, except that which makes the fastball more or less effective.

Curveball - Used (11%) League Wide

Average Hit/Strike Rate for 2016 = 8.08%

In heavier air qualities in the MLB, the curveball gets a lot of movement and the slower speeds tend to get greater movement yet. This is because the air can push the baseball in the direction of the curve more quickly in its path toward the plate. Once the air begins the push, each segment of distance adds additional push, ending with a greater angle off its straight path. In lighter air qualities, such as Colorado in Coors Field, or Kansas City in the heat of the summer, the curveball will travel further before the air begins pushing the ball in the direction of the spin. This creates a later breaking and lesser breaking curveball, and the data shows it is overall less effective than in heavier air.

Knuckle Curve (Included in Curve Data - used about 1%)

The knuckle curve is a pitch which essentially is designed to cause the hitter to mis-identify it in the first few feet of travel. It is thrown overhand like the other pitches and, of course, in the same arm angle as are the other pitches. However, the pitch is thrown with the fingertips pushing over the top of the ball to create forward spin in a four-seam configuration as opposed to the backward spin of the four-seamer. It is difficult to identify early, because the spinning four seams create a similar visual to the 4-seamer. Its action is a late breaking dropping action at the end of the travel near the strike zone. Although late breaking, the hitter must use a similar form to hit it as he uses in hitting the downward breaking curveball. Therefore, we have not created a separate data category for the knuckle curve within our air density categories as of this time.

The next article will focus on the Sinker and the Cutter which can be part of the "Loose Pitcher's" repertoire.

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When is the Sinker Most Effective on the ADI and VMI Scale?

by Clifton Neeley www.baseballvmi.com

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Sinker - Used (7%) League Wide

Average Hit/Strike Rate For 2016 =11.02%

"Reverse" pitcher throws the Sinker or Two-Seamer far more often than the traditional four-seamer

The Sinker is another pitch, which if used in more than 20% of the total pitches thrown by the starting pitcher, identifies him as a Reverse Pitcher. If you note that the pitcher your hitting team or player is matched up against in today's or tomorrow's game is prone to throwing a high number of Sinkers, then he will be more successful against a High Plus VMI team than a High Minus VMI team with that pitch. A "Reverse" pitcher is one who throws a Sinker above 90 mph as one of his primary two pitches. So, a High Plus team will be more successful against a Tight Pitcher and a High Minus team will be more successful against a Reverse Pitcher.

A sinking pitch can be thrown several ways. The value is in the speed. Gravity alone will cause a pitch to drop, but disguising it, plus keeping it in the zone or just below the zone in the 90 mph ranges, is the key. It appears that some pitchers rotate the ball with a similar spin to a bullet that is, with the nose (or center of the rotation) pointed toward the catcher. With no backward spin, the ball will not lift, so the speed and the gravity can be the primary forces at play.

In heavier air, the Sinker will sink more because of the seams that are revolving around the perimeter "nose" of the ball and thus acting as a sort of parachute to slow the ball. As you can probably imagine, in lighter air the ball will travel further before sinking and so becomes a late breaking pitch. At high speeds in either environment, it is devastating to a hitter who is sitting on a four-seam fastball, as most do.

Cutter (or Cut Fastball - Used 5%) League Wide

Average Hit/Strike Rate For 2016 = 9.59%

A "Loose Pitcher" is one who throws the Curveball, Cutter, Splitter and maybe a Slider

The Cut Fastball can be thrown either above or below the 90 mph range with good success. The key here is probably the element of surprise. If it is thrown too often, it is a

pitch that a Major League hitter can put his bat on. We have labeled as "Loose" a pitcher who throws many Cutters, plus many Sinkers, plus many Curveballs and/or an additional pitch. In my earlier days, this type of pitcher who rarely throws the typical four-seamer was called a "Junker." This type of pitcher is a "Loose Pitcher" because he presents many ways in which to get a hitter out. However, a Loose Pitcher also presents many ways by which to lose a game, especially to a team who sports a High Minus VMI. When using the VMI, look for a team who is High Minus against a pitcher who would probably be considered Loose. That is a combination that favors the hitters.
The Cutter by itself is a great pitch. It can be thrown as a one-seamer--that is, with the ball turned in the hand to create an up and down seam that aligns with the opposite seam to present the visual--when spinning through the air, that one seam wraps around the entire ball. This visual of one seam leaning the direction of the arm slot creates a sort of Frisbee© effect. The wrap-around seam then cuts through the air with the air pushing the seam and ball sideward and downward. In heavy air it will break sooner, in its path toward the strike zone and in lighter weight air it will break later.

This pitch is used only about 5% of the time. Most pitchers try to disguise the one-seam by rotating the ball in the grip slightly to keep the one seam from becoming easily recognizable. This tactic can be a double-edged sword. It can disguise the pitch, but it loses some movement. It also makes it a pitch that is very sensitive in terms of being ineffective vs extremely effective. As such, it must be thrown almost perfectly from the arm-slot to the finger release.
Effectiveness data on this pitch is pretty consistent regardless of the ADI in which it is being thrown.

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A "Loose Pitcher" is one who throws Several Additional Pitches

by Clifton Neeley www.baseballvmi.com

Splitter - Used (1%) League Wide

Average Hit/Strike Rate For 2016 = 9.69%

The Splitter is essentially a change-up. It is thrown with the fingers split wide apart to give the appearance of a fastball, either two-seam or four-seam. However, the wide fingers allow arm, elbow, wrist and finger snap to appear strong, but the velocity is inhibited. There may be other variations of the splitter that I am not aware how the pitcher performs it, but this description probably covers most of the philosophy and mechanics. Since some of the velocity is taken off this pitch, then the effect of the air density is lessened as in the case of the change-up. It is used more as a surprise than as a movement challenge to the hitter. The Splitter is not used frequently and probably for good reason. It is one of those pitches that a Loose Pitcher can use effectively one day (especially against a High Plus VMI Team) and then get taken advantage of on the next (especially against a High Minus VMI Team).

The Splitter is most effective as a counter pitch to the two-seam or four-seam, but can also be an additional pitch in a slew of off-speed pitches. As I mentioned in another recent article, a "Loose Pitcher" presents many ways in which to get a hitter out. However, a Loose Pitcher also presents many ways by which to lose a game, especially to a team who sports a High Minus VMI. When using the VMI, look for a team who is High Minus against a pitcher who would probably be considered Loose. That is a combination that favors the hitters.

When you are utilizing our database at baseballvmi – keep in mind that you can narrow the pitch data down to a single game by using the team name and the specific date, but that is only where the date is one of the options listed.

Knuckleball - (1% of the total pitches thrown in MLB)

Hit/Strike Rate for 2016 = 9.12%

The "Knuckleballer" is a category of its own

Oh, the knuckleball. It dives and darts every which way. Up, down, side to side and all angles in between. It confounds everyone, mathematical geniuses, physicists, engineers, and all who try to describe or especially to quantify it. Of course, I have never seen a mathematical formula put to an inflated balloon having been released with the valve open, either.

In Major League Baseball, there are only about four pitchers who throw this pitch at all. Since **Tim Wakefield** retired; only **Stephen Wright, R.A. Dickey, Kevin Plawecki, and Eddie Gamboa** throw a knuckleball regularly, and only Wright and Dickey are starters. Those two starters throw this pitch at a rate of about 60% each, making only a 1% dent in the total pitches thrown in all of MLB. However, for those pitchers it is as effective as, or more effective than any other pitch. It is just a difficult pitch to throw

because it must have no spin on it whatsoever as it releases from the pitcher's hand. Dickey throws an 84 mph knuckleball about 62% of the time with a 59% accuracy rate. Hitters get a hit on about 9% of his strikes thrown (2016-2017), and he pitches primarily in heavier air ranges 65 ADI to 72 ADI. Wright throws a slower knuckleball at a 78 mph average, approximately 70% of the time with an accuracy of about 69%. Hitters connect for a hit on about 11% of his knuckleball strikes (2016-2017). Gamboa threw only 131 knuckleballs representing 59% of his pitch selection decisions in 2016 with an accuracy rate of 60% and hitters connected for a hit on 6.33% of his strikes. Dickey is now pitching for the Atlanta Braves, and it remains to be seen in 2017 if his effectiveness is affected by the lighter air (55 ADI to 61 ADI). Thus far in 2017 his percentage is higher in the lighter air (60s ADI-12%) than in the heavier air (70s ADI-0% hits).

I'll attempt to describe the knuckleball from a layman's perspective. The best knuckleballs I've seen personally and attempted to catch regularly have been on a fastpitch softball in the 60-70 mph ranges, but I've also been victim to line drives in the outfield that knuckleballed off the bat at a much higher speed. And I've seen soccer balls and volleyballs knuckle in flight, as well. I'm quite sure you have experienced many of these too.

Unfortunately, aerospace engineers and physics professors are in a certain amount of disagreement regarding projectiles flying through the air. So, until someone puts this together better than the real world observations and experiential understandings of those of us who have thrown, hit, caught, observed, missed, been hit in the nose by, been made a fool of, explained a black eye, and studied them in flight, in my next article I will share with you how this phenomenon most likely works in the real world.

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So, How Does a Knuckleball Dive and Dart?

I'll attempt to describe the knuckleball from a layman's perspective. The best knuckleballs I've seen personally and attempted to catch regularly have been on a fastpitch softball in the 60 mph ranges, but I've also been victim to line drives in the outfield that knuckleballed off the bat at a much higher speed. And I've seen soccer balls and volleyballs knuckle in flight, as well. I'm quite sure you have experienced many of these too.

Unfortunately, aerospace engineers and physics professors are in a certain amount of disagreement regarding projectiles flying through the air. So, until someone puts this together better than the real world observations and experiential understandings of those of us who have thrown, hit, caught, observed, missed, been hit in the nose by, been made a fool of, explained a black eye, and studied them in flight, then the following is my understanding of how this phenomenon most likely works in the real world.

Dr. Adair in his book, The Physics of Baseball, describes baseball this way; "Some people have asked, 'Well, baseball isn't rocket science, is it?' to which Dr. Adair replies, "No, it's a lot harder!" The reason, as he explained in his book, is that a cone at the nose of the rocket is pointed and smooth, whereas the baseball has sort of a yin-yang pattern of stitching surrounded by a smooth leather skin stretched around the ball. It makes it difficult if not impossible to put a mathematical formula to its flight.

I like to say it this way--along the path even a fastball takes, pressure builds up on the front of the ball caused by molecule displacement. As the air attempts to equalize, pressure builds and pushes the ball off course. This phenomenon is akin to the reason that airplane wings slant backward to afford a "wiping" effect of air molecules off the leading edges, and the reason rockets are built with cone-shaped noses. A knuckleball, however, moves two or more different directions (sometimes upward) in a "hopping" fashion from the same cause, i.e. air pressure buildup.

Now, did that explanation convince you? Well, let me try again after explaining a couple of things we already know about the air from other industries that the engineers, physicists, medical professionals, aeronautics professionals, meteorologists, and scientists have known for centuries--and have helped these industries to adjust to conditions all over the world.

Air pressure is caused by all the weight of the air stacking up on the earth due to gravity, just like the weight of anything else. Naturally, the lower elevations of the earth, then, have

more air molecules stacked up. Denver, Colorado has 5,280 feet **less** air stacked upon it than a sea-level city; a 16,000 foot elevation mountaintop has 16,000 feet less air stacked upon it. The weight of the air above pushes down ***and out*** upon the air below creating a pressurization that surrounds the whole earth. Air molecules repel each other vigorously, so that they stay evenly spaced and they create substantial power when pushed together, as you know from other industries such as the air compressor industry.

This evenly spaced air is the cause of all kinds of events such as wind, which pulls cold air into conformity with hot air. This results in tornados, sandstorms, hurricanes, typhoons, and any kind of weather event you can think of. It also is the cause of tiny things we don't think of very often, such as humid air pushing into dry air.

So, to help this discussion about the knuckleball, let me repeat an explanation of the air I read from a column in a Denver newspaper by Mike Nelson, a local meteorologist. **He said something like this:**

Humidity does not create heavy air, as most people think. Since Nitrogen is heavier than Hydrogen, then two molecules of Hydrogen attached to Oxygen (to begin to create H2O) humid air is lighter (not heavier) than dry air, here's why. Imagine a one cubit foot of air floating in front of you. Air molecules are made up of: mostly Oxygen, Nitrogen and Hydrogen. Nitrogen is attracted to Oxygen and Hydrogen is attracted to Oxygen, but Hydrogen and Nitrogen repel each other even as they are attached to the Oxygen. Since the block of air must remain in a state of equalized pressure within its geographic elevation, if one new molecule of Hydrogen enters that block of air in order to create humidity, a molecule of Nitrogen must be kicked out of the block. So the magnetism between Oxygen and Hydrogen allows the lighter Hydrogen in, and the extra repelling pressurization kicks out an equal number of heavier Nitrogen molecules.

With that equalization concept in mind, consider what would happen if a baseball entered that same block of air. As the baseball enters the block, it displaces a huge number of molecules (into the quintillions in number). As it pushes through the air, it knocks molecules straight back from the center of the nose of the ball and into adjacent molecules, which push back. It knocks some molecules back at a slight angle to the side. Some molecules that are further from center of the nose of the ball are swept around the ball on all sides by the adjacent equalized air within the block. Then, when the ball passes by these molecules, they snap back together behind the ball, equalizing to their natural distance. So, it is the molecules which get pushed straight back into the other air molecules that create the extra pressurization in front of the nose that build up on the non-spinning, free-flying knuckleball. The "Yin-Yang" stitch pattern, which is really in an "S" pattern of four circles and one open section on each, creates a parachute of sorts, holding some of those molecules in front of the moving ball. When the molecules collect together enough to create more pressure than the weight and momentum of the 6 oz. ball, then the ball slides around this bank of pressure in the direction the open section allows. The baseball is then turned slightly by this action and another pressure bank builds, but now the open section of the seams is faced in a different direction (sometimes) allowing the air to push the ball in a different direction--even upward--but sometimes a double, or triple push in the same direction causes the ball to float or fall off--***totally weird***.

Visual Memory by Clifton Neeley, creator of the Visual Memory Index© and author of the web-site www.baseballvmi.com. Clifton pitched and played baseball and fast-pitch softball in the mountainous southwest Colorado area from 4,000 feet in Grand Junction to 6,000 feet in Durango to 9,000 feet in Telluride prior to his college experience in baseball.

Utilizing the VMI and ADI quickly

by Clifton Neeley

In recent articles I identified different pitcher-types with which we can compare effectiveness rates against the ADI and the VMI. These four types can help you quickly decide whether the pitcher is in trouble, or the hitters are in trouble for today's games.

Do a last minute check

If you want a last minute check against buying a pitcher or hitter for today's contest, check our database to see if he is a "Tight," "Reverse," or "Loose" pitcher against a hitter who is in a good or bad VMI range to perform against his pitch-type. At this time we are working to provide you some ways in which to check this aspect more quickly. You should use the "Pitcher Stats by ADI" under the Members menu at **baseballvmi.com** by selecting the team and pitcher name and querying today's game ADI. Then check the hitter's data in the "Sortable Stats" under "MLB top 50" by querying the team, date range (I suggest using 201 instead of 2017, in order to get additional years' data), select more than "10 at bats," and check his hitting contribution against those pitches in today's team VMI range.

The "Tight Pitcher" (remember, this pitcher throws the Four-Seamer primarily and the Slider and Curve) is better against a Low (+ or -) VMI team, or a Negative VMI team, but will get hit harder in thin air environments (below 60 ADI such as Atlanta, Texas, Kansas City, Arizona and of course Colorado) that typically generate high plus VMIs.

The "Loose Pitcher" (he throws several off-speed pitches, but not many Four-Seamers)-- reviews of the data are mixed, because he is better against a High Plus VMI team in a High ADI, but he is usually worse against the High Negative VMI team and in Low ADI's. But, because the pitches are typically slower--even this is tough to call due to mental focus of the hitting team. An over aggressive team that is pressing will stay off-balance due to the slower speeds; but a team that is relaxed and having fun is likely to pound this pitcher.

The "Reverse Pitcher" (he is a Sinker Ball pitcher, or a higher than normal number of Two-Seamers) - better against the High Plus VMI team, but worse in the Higher Negative VMI team outings. This, of course, is due to the hitter's "Visual Memory" causing him to set up to deal with the upward lifting Four-Seamer, plus being able to identify and change his body position (within a half second) to hit the lesser lifting Two-Seamer and downward breaking Sinker, Slider, Curve, etc.

The "Knuckleball Pitcher" (Obviously he concentrates primarily on the Knuckleball) – he is always a tough pitcher to deal with, but most likely more so in the Welterweight ADI atmospheres where most teams play the largest portion of their schedules. Interestingly, pitchers avoid throwing the Knuckleball in the very heaviest air that we have labeled Heavyweight. Furthermore, the Knuckleballs thrown in the lower 70s ADI haven't been super successful either. Although it would seem that a pitcher could get really good movement on this diving, darting and hopping pitch in the heaviest of air, he may have a little more difficulty controlling the Knuckleball. Since the heaviest of air is also going to be the coldest air at sea level, then one can imagine that the bitter cold would have an effect on the pitcher's grip, feel and comfort. Add to those issues the fact that all his other pitches should be effective in the heaviest air, and the fact that any speed Four-Seamer will be

more difficult to hit at cold sea level locations, and you can see why a Knuckleball pitcher may choose them over the Knuckleball.

We have been tracking pitches in MLB since 2014, and no pitcher has ventured a Knuckleball in Colorado's Featherweight climate, either. It may be that the right team with the right pitcher has not been scheduled to pitch there since we began tracking every pitch, but it may also be that it is too risky to venture, in the minds of managers and pitchers.

Regardless of the reasons, we have no data in the past three years for the Knuckleballer in either the heaviest of the Heavyweight or the Featherweight climates. It remains to be seen how Dickey finishes the year in terms of hit-to-strike percent as a member of the Lightweight climate Atlanta Braves. Obviously, he had a great game recently against the San Francisco Giants when they were a high negative VMI team arriving directly from Coors Field in Denver.

In my next several articles I will outline both physical and mental aspects of each of the VMI Ranges that we have assigned to teams while adjusting to each climate. There are some team tendencies that I have discovered that are very significant to winning, though I had no foreknowledge this would be the case. We can now tell when the starting pitcher will be over-matched by the hitters, under-matched against certain teams or equally matched up between pitchers, hitters and teams. When the Air Density Splits and the VMI splits eventually get added to all the Sabermetrics data that is being maintained by long-time Sabermetrics professionals, then these splits will show the individual hitter's tendencies more clearly against each pitch-type. At that time, we all should be able to match up a hitter against the starting pitcher, as well as to the balance of the bull pen. At this time, the team data is showing clear tendencies, but the individual data is still too voluminous for our individual organization to easily drill down to the individual player for easy access by fantasy baseball participants. Therefore, the team tendencies need to apply to all that team's players--so you will be wise to select your players before attempting do a final check against the VMI and the ADI. Till next time….

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Putting a Microscope on the ADI and the VMI

by Clifton Neeley www.baseballvmi.com

I have previously stated that our website has been tracking pitches since 2014. I have been tracking team production against the ADI and VMI since 2001 and 2005 respectively. The pitch tracking system which is now in place allows me to input the actual pitches, pitcher, pitch speed and hitter plus his production. We did not begin applying the ADI to every pitcher until 2015—and, then only on a few of the teams. So I am learning new things on an annual and sometimes monthly basis. Of course we are working on a win-loss predictive index, but at this time, it is not ready for publication.

Below is a chart of the end of year percentages of hits to strikes thrown in the primary ADIs and in the VMI ranges with "probable" ADI ranges listed. I say probable, because any ADI will eventually produce a zero VMI, as the team of hitters adjust to this amount of ball movement.

All Major League Pitches - 2016

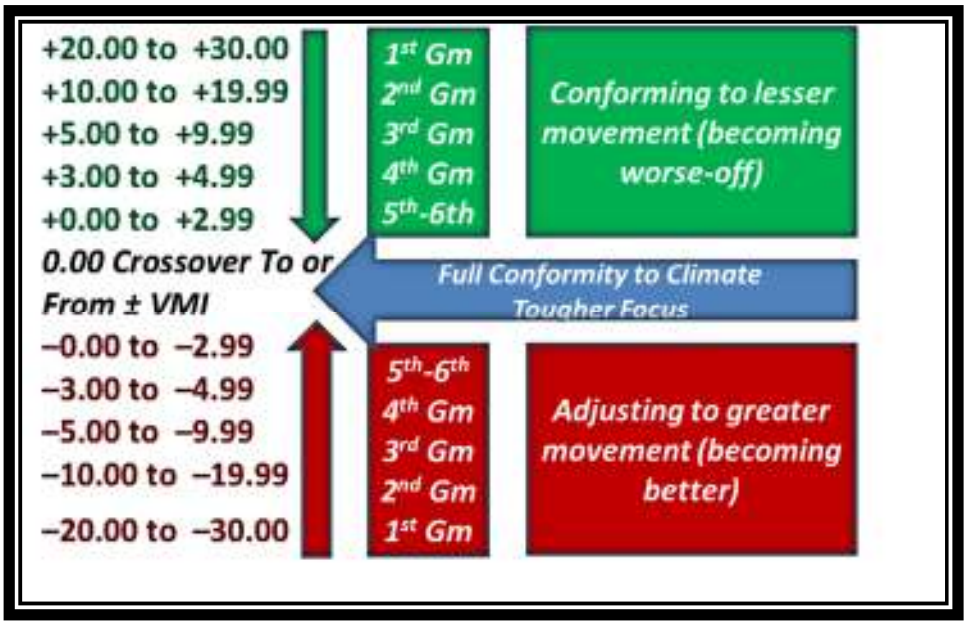
Percentage Pitcher Efficiency In ADI vs Base Hit Rate in VMI

721,848 Total Pitches	4-seam	Slider	2-seam	Change	Curveball	Sinker	Cutter	Splitter	Knuckleball
Pitches	263032	110433	97982	74200	79185	47140	35770	10565	4256
Strikes	170423	70230	61958	45774	46728	30130	23013	6463	2610
Hits	15288	5881	6900	4566	3774	3321	2208	626	238
Pitches %	36%	15%	14%	10%	11%	7%	5%	1%	1%
Strikes %	65%	64%	63%	62%	59%	64%	64%	61%	61%
Hits %	8.97%	8.37%	11.14%	9.98%	8.08%	11.02%	9.59%	9.69%	9.12%
FEATHERWEIGHT / ADI 40	11.35%	9.37%	11.62%	11.87%	9.76%	14.53%	11.59%	8.60%	n/a
LIGHTWEIGHT / ADI 50	9.77%	8.43%	11.74%	10.51%	8.57%	11.48%	9.92%	9.92%	10.55%
WELTERWEIGHT / ADI 60	8.82%	8.36%	11.01%	9.83%	7.91%	10.63%	9.59%	9.54%	9.16%
HEAVYWEIGHT / ADI 70	8.28%	8.67%	10.02%	9.51%	9.61%	9.90%	8.08%	10.84%	7.64%
VMI +20 / ADI 35-45	12.26%	11.04%	12.96%		10.57%	11.36%	9.04%	5.88%	n/a
VMI +10 / ADI 45-55	11.46%	7.07%	12.33%		11.11%	14.69%	13.10%	6.67%	n/a
VMI +0 / ALL ADIs	9.20%	8.37%	11.47%		8.16%	11.12%	9.83%	9.93%	10.10%
VMI -0 / ALL ADIs	8.69%	8.37%	10.82%		7.92%	10.93%	9.28%	9.64%	8.73%
VMI -10 / ADI 55-65	7.99%	9.03%	10.06%		8.30%	7.14%	8.74%	10.14%	5.05%
VMI -20 / ADI 65-75	3.10%	7.81%	7.05%		8.26%	15.48%	5.08%	50.00%	n/a

Pitcher Types

The "Tight Pitcher"--better against a Low (+ or -) VMI team, or a Negative VMI team.
The "Loose Pitcher"--reviews are mixed, because he is better against a High Plus VMI team in a High ADI, but worse against the High Negative VMI team and in Low ADI's--"normally" --but, because the pitches are typically slower, even this is tough to call.
The "Reverse Pitcher"--better against the High Plus VMI team, but worse in the Higher Negative VMI team outings.
The "Knuckleball Pitcher"--always a tough pitcher to deal with, but most likely more so in the High ADI atmospheres.

VMI Tracking: Keep the following graphic in mind as you watch a series between two teams; conforming to lesser movement and adjusting to greater movement is a strong tendency and has remained true over the course of full seasons since 2001. April of each year gets it started, but by mid-May to mid-June, conformity is apparent.



The crossover from Plus to Minus makes the transitional baseball tricky, but fun.

When a team has been in a long home stand against several opponents and a cold front comes through the region, the home team drops from a small plus to a lager minus VMI. A home team can normally overcome it, but a visiting team may struggle if the change in temperature is downward by more than about ten degrees Fahrenheit.

Tricky transitions also occur when a road team moves from Los Angeles Dodgers to San Francisco Giants immediately after getting fully adjusted to Dodger Stadium. In this case it is caused by both an elevation change and normally includes a temperature change.

A crossover from Minus to Plus normally occurs to a road team switching to a less dense climate in the middle of the trip.

A reverse example can be used: a team travelling first to San Francisco and getting fully adjusted after, say, a four-game series, then moving on to face the Dodgers in their stadium. A typical Central Division

team would first go into the Giants' stadium as a Mid-Minus VMI Team and then come out as a Low Plus VMI Team in Dodger Stadium (500 feet higher & warmer in Chavez Ravine).

Smaller crossovers typically happen on the East Coast where coastal teams play each other. These crossovers are lesser in degree, so don't greatly affect the teams, but when they reach above ±4.00, they can create movement issues in addition to the usual focus issues for a hitting team.

The uniqueness in the varied VMI Ranges and how to interpret them for your selections:

Plus Ranges of the VMI

+0.01 to +2.00 – This range is where air density is pretty much a non-factor. The ball movement is less than the hitter is used to seeing, but by an amount that does not exceed ¼ of an inch. For you and I, trying to predict an outcome between teams, hitters, or pitchers is difficult because this is the range where most games in MLB are played. Since ball movement is not unique, then mental focus and consistent performance is a bigger challenge for both hitters and pitchers. This range produces sort of a 50/50 league in terms of wins and losses. It is the range where there is a high tendency to win today and lose tomorrow more than in any other VMI range. So when picking individuals who may overcome the norm, try to find mentally tough players for your team who perform consistently well in this range. Also, depend on more of your traditional indices than on the VMI for prediction.

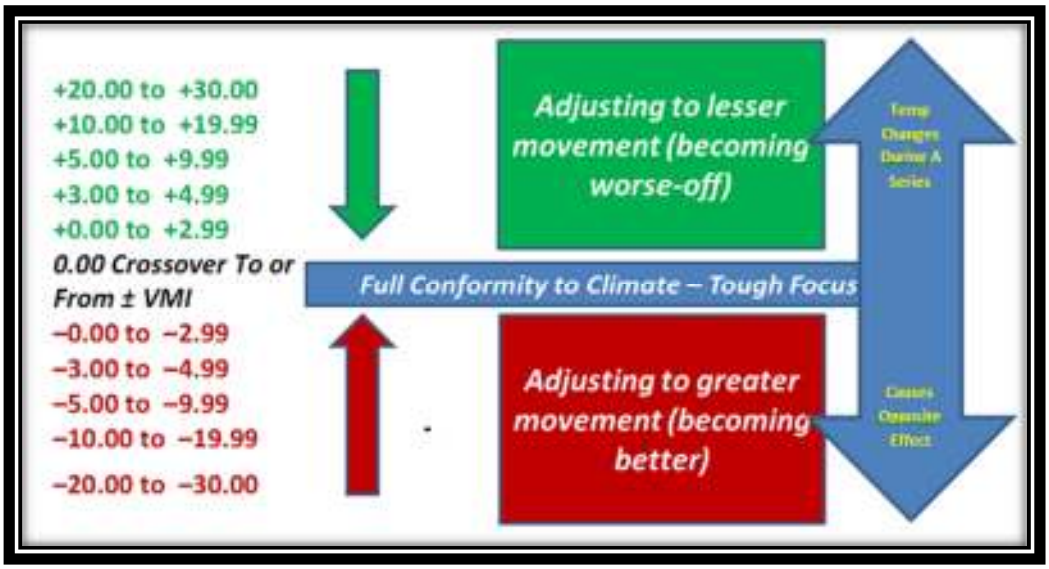
Minus Ranges of the VMI

-0.01 to -2.00 – Once a team gets close to the -2.00 range is where air density may begin to be more than a non-factor. The Four-Seam ball movement is a little more than the hitter is used to seeing, but by an amount that does not exceed ¼ of an inch. Since ball movement is only slightly more and not really unique, then mental focus and consistent performance is a bigger challenge for both hitters and pitchers. But here is where the hitter can see what the pitcher, catcher and manager cannot see. The hitter notices on the first swing at a fastball (4-seamer) that he is not on it. He either hits a long fly ball or foul or maybe even a pop-up. So, this creates the beginning of his better focus on the pitch itself for this particular game. After one or two at bats (by approximately the fourth inning), this hitter will most likely be very dangerous against the Four-Seamer, and since his set-up is closer to the Two-Seam and Sinker--anything can happen. The pitcher who tends to be a Loose Pitcher, attempting to get slower breaking pitches by this hitter, can come away very disappointed.

So what does zero VMI really mean?

As I mentioned earlier, zero is where 50/50 winning baseball occurs: that is, where teams tend most to win today and lose tomorrow. Zero, of course, means the players are very familiar with how the track of the pitch looks and how to set up to hit it squarely. The players tend to turn their attention to the pitcher, his form, and his release, and may start trying to out-guess the pitcher and catcher. They can place the ball better in this range and may also start trying to "beat the shift," because making contact is

relatively easy. Small ball is more successful because bunting is more consistent, as is hit and run. However, at zero and therefore "full conformity to the climate," little things such as a weird release, or additional rpm on the seams of a ball can make enough difference to throw hitters off their game. Their focus also tends to shift to their own mechanics. Frustration sets in at this level for all the teams, and this is also where an entire team can begin to hit the ball straight at the defensive players which adds to the frustration. Whether this is because of over-thinking or just the breaks of the game is certainly still in question, but this tends to occur more frequently about the 5th or 6th game within the same climate, and you will notice that these teams tend to have a "Zero" day of scoring. In most environments both teams (home and visitor) will sport a VMI below +2.00 and -2.00 at the same time, so it is little help in determining which team will follow this trend, but most likely it will be the team in the series who is dropping in VMI from the plus side of zero rather than the team who is rising toward zero from the large minus VMI side of the index. See the graphic below with the arrow at the far right:



The Cross-Over from Minus to Plus

As you have undoubtedly noticed, the team VMI formulas track the team from "very unfamiliar" for game one away from their home stadiums and progressively get closer to zero ("familiar conditions"). This is true on both sides of zero. When a team begins at a high minus for the first game, and then progresses toward zero, it is getting better; however, when a team begins at a high plus and progresses toward zero, it is getting worse. That is, the team becomes more and more acclimated to the ball movement, and at the range of below about 3.00, the players tend to lose focus more easily.

It appears that there is a different effect when a home team crosses over from Minus to Plus and also from Plus to Minus, than when a visiting team crosses over from Minus to Plus, etc.

The Cross-Over from Plus to Minus

The small increment crossovers occur once a team gets fully acclimated and a cold front comes through, or a team moves to a similar stadium environment such as where Mid-West Central Division teams play. They also happen more frequently when a team remains in its home stadium for an extended home stand. Mental focus is tough in this Visual Memory state.

It appears from our data that the home team enjoys about a 53% winning percentage over the visiting team under these zero to 3.00 VMI ranges. That should match up with Sabermetric data fairly closely for an overall home team advantage.

Larger crossovers also occur, but less frequently. Later in this series I'll outline some of the physical and mental tendencies that occur due to larger crossovers.

In my next article I will venture into the higher VMI ranges and reveal some of the mental and physical aspects that appear to be a reality in MLB.

Watch out for a team who consistently overcomes these VMI tendencies. That team is staying focused and it can carry them –all the way!

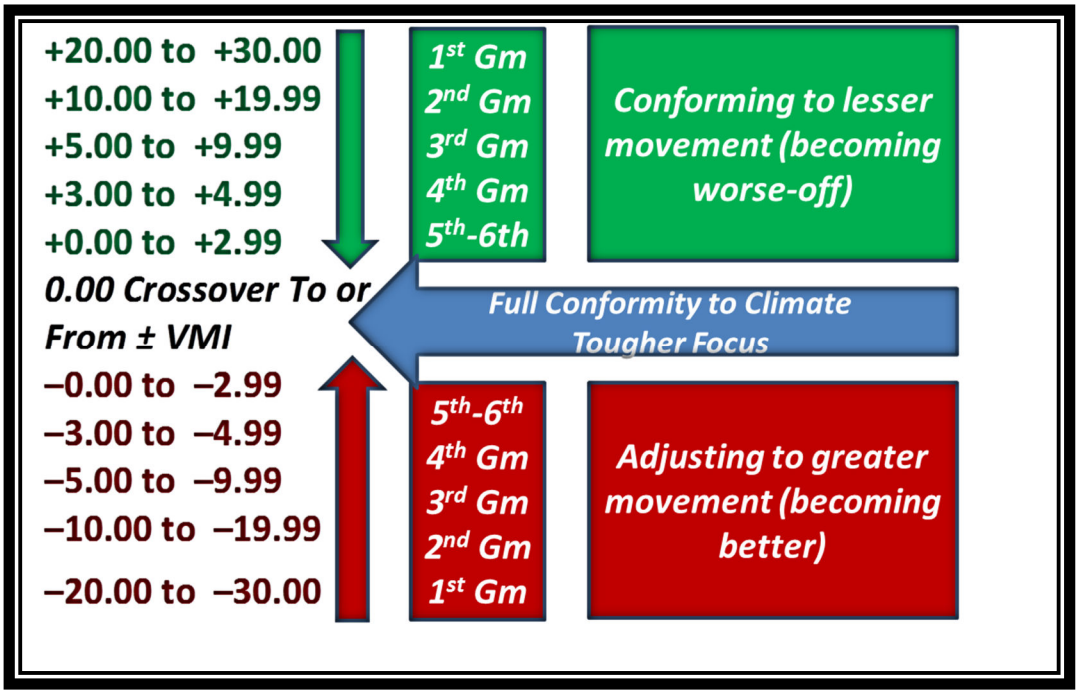
Visual Memory by Clifton Neeley, creator of the Visual Memory Index© and author of the web-site www.baseballvmi.com. Clifton pitched and played baseball and fast-pitch softball in the mountainous southwest Colorado area from 4,000 feet in Grand Junction to 6,000 feet in Durango to 9,000 feet in Telluride prior to his college experience in baseball.

Putting a Microscope on the ADI and the Larger VMI at ±2 to ±8

by Clifton Neeley www.baseballvmi.com

VMI Tracking:

Once again, keep the following graphic in mind as you watch a series between two teams; this (conforming and adjusting) is only a tendency, but appears to remain true over the course of a season, even if April and September do not conform exactly.



The tendency also depends somewhat upon where exactly on the above scale a team begins a road trip. If a team first enters a heavier air environment at only a minus 3.00 it may not throw the hitters off much in terms of pitch movement. On the other hand, if the team enters the first game of a road trip at a minus 9.00 and two games later you see a minus 3.00, then today at minus 3.00 it may be a huge relief to the hitting team. This is especially true when a team has competed against a Tight Pitcher yesterday at say, minus 6.00, and today gets the luxury of seeing a Reverse Pitcher at the example of a minus 3.00.

+2.01 to +4.00—This range is where air density first becomes physically noticeable on the plus side of the scale. The amount of movement is truly less than the hitter is used to seeing, but by an amount that is up to ½ of an inch on the main pitch in baseball. This becomes more significant because the pitcher who throws the Four-Seam fastball as his primary pitch cannot detect his ball movement difference against what the hitter is used to seeing--without a telescope in the form of the VMI. So his tendency is to throw the same pitches he always throws (very carefully) until the hitters show him and his catcher what they can do today. To further complicate this scenario, most pitchers, catchers and

managers take each hitter as an individual, as opposed to looking at the team as performing substantially alike. The VMI is counter intuitive to the baseball professional, because the people who fill those positions have not looked at the team as a whole in past years. Since they may not be watching the VMI yet, you have a good opportunity here. Take a look at the type of pitcher who is starting against your player. If he is a "Tight Pitcher," your player will probably hit his average or greater against him. If he is a "Reverse Pitcher," hitters will struggle with the Two-Seam and the Sinker, but will hit the slower pitches much better. Shortly, we will be able to provide you with a "Detailed Team Match-Up" which will provide you with the pitcher-type and the actual production percentages within those ADI and VMI ranges.

+4.01 to +6.00—This range makes a hitter very dangerous. It is between ½ inch "less" movement and ¾ of an inch less on that primary Four-Seam fastball.

As in the lower ranges, if he is a "Tight Pitcher," your player will probably hit his average or greater against him. If he is a "Reverse Pitcher," hitters will struggle with the Two-Seam and the Sinker and maybe the Slider, but will hit the slower pitches at a greater clip.

+6.01 to +8.00-- This range makes a hitter extremely dangerous. It is between ¾ inch "less" movement and a full inch less.

The pitcher type is extremely important here, just as it is in all the greater movement conditions within transitional baseball in college and MLB. Let's take a look at the minus VMI side of the scale.

-2.01 to -4.00-- If he is a "Tight Pitcher," hitters will focus harder on the Four-Seamer and the Slider, and could actually hit better in the latter part of the game after some good exposure. This condition is very common in MLB and is not considered a unique condition by the players. However, the slower, breaking pitches will probably be dangerous to throw in the early part of the game. If the pitcher is a "Reverse Pitcher," your player will probably hit his average or greater against him on the Two-Seamer and/or the Sinker alone.

-4.01 to -6.00—This is a dangerous condition for the hitter, but if his team has struggled for several days to adjust and is now adjusted upward from a larger disadvantage, then they may be well up to the challenge both mentally and physically.

If the pitcher is a "Reverse Pitcher," your player will probably crush the ball against him. If he is a "Tight Pitcher," hitters will struggle with the Four-Seam and the Slider, but will hit the slower pitches much better.

-6.01 to -8.00--Same comments as above, but just a little more emphasis. We are talking about a condition where the pitches are moving one full inch or more, greater than this team has been recently exposed to. It could have a great effect on the hitters, depending on the type and speed in the pitcher's arsenal. A Reverse Pitcher is probably in big trouble.

This is what I call the Mid Minus VMI Range and the production within it will depend on whether this is the first game in the series or if a team left Coors Field several games ago. If this is the third game away from Coors Field, then this team could be dangerous while approaching "normal baseball" in MLB by adjusting to it from the first two games' exposure.

If it is the first game of a series away from a venue such Texas, which is another "Lightweight Air" venue, it will probably fit the scenario whereby the hitting team is surprised that they are under the fastball and must begin to adjust to the Tight Pitcher.

Our new "Detailed Match-Ups" web page will also show the distinctions I've outlined between pitcher types so that you can become very familiar with what is happening in the mind of the hitter.

You have witnessed the rise and fall of the Colorado Rockies once again this year. Remember, the Rockies lost two games at home before they transitioned to Dodger Stadium where they lost three and then traveled to San Francisco to lose three more. Those two losses at home were after they had dropped below a plus 2.00 VMI. Their opponent, however, sported a High Plus VMI after arriving at Coors Field. Then the Rockies became a High Minus VMI team in Dodger Stadium, and by the time they arrived at AT&T Park they transitioned as a Mid Minus VMI team, getting swept by both teams.

You probably witnessed the Rockies playing terrible overall baseball during that trip. Losing games affects confidence; losing confidence affects decision-making even on defense. Losing good decision-making has a negative effect on the entire team, and the pitchers become tentative at the same time as the hitters become timid in decision making, yet over-aggressive on the pitch at the plate. It is extremely tough to turn that around, especially when the team faces another High Minus VMI road trip.

Next time we'll look at even higher VMI ranges and then, move on to deeper issues with team psychology.

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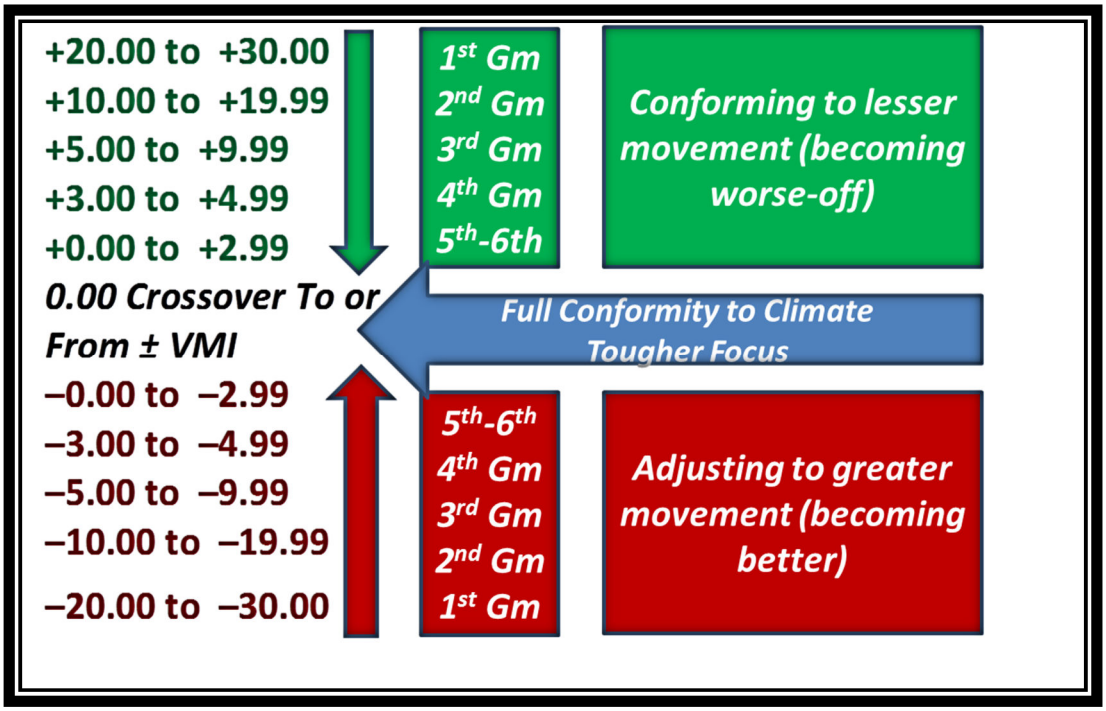
Putting a Microscope on the Larger VMI Ranges

by Clifton Neeley www.baseballvmi.com

VMI Tracking: The Larger Plus Ranges of the VMI

The uniqueness in the varied VMI Ranges and how to interpret them for your selections:

Below is the same graphic I used in the previous article. It helps to remember that the VMI tracks Home Teams as they stay in their home venue for more than one series. It also tracks Visiting Teams as they travel to various venues both familiar and unfamiliar (with the air--that is).



+8.01 to +10.00—This range makes a hitter **very** dangerous. It is between 1 inch "Less" movement and 1-1/4 of an inch less movement on the Four-Seamer and percentage similarities on the additional pitches of the arsenal.

If the pitcher he is facing today is a "Tight Pitcher," your player will normally hit greater than his average against him. If he is a "Reverse Pitcher," hitters will struggle with the Two-Seam and the Sinker, but will hit the slower pitches much better. A "Loose Pitcher" will often be more effective in this range, because he can keep the hitter from sitting on the fastball. This range is also the "Knuckleballer's" bigger challenge to get by hitters with little damage done.

In other words, a team of hitters in this range is very dangerous, and they probably don't need much coaching or additional focus to perform well. In fact, they are relaxed, having fun; even their team defense and decision-making is generally better.

+10.00 to +20.00

This is where Colorado lives at home in their first several games back from a road trip. And as the whole baseball world has noticed, every team that arrives at Coors Field will tend to hit the ball well. If both teams are in this range, it is next to impossible to determine which is going to win the game or even hit better than the other. Both teams of hitters are very dangerous, especially when the visiting team gets one game of adjustment behind it.

However, in the second series for the Rockies while at home, their VMI begins to fall toward zero, so they are too adjusted to their own environment and eventually fall into the 50/50 win category where focus is tougher—just like all the other teams in the zero categories.

"Tight Pitchers" and "Loose Pitchers" are in the biggest danger of being victim to hitters in this range. However, in the early spring when the temperatures are colder in Colorado, the Slider is devastating, so the Tight Pitcher can be effective until the summer arrives. When teams arrive in Atlanta, Kansas City, Texas and Arizona, which are the other Lightweight venues during summer months and sport a higher than Plus 10 VMI, they are also very dangerous, but are prone to becoming victim to the "Reverse Pitcher."

+20.00 to +30.00

This range is only a matter of degree greater than the same issue as discussed above. It too is caused by a team arriving at Coors Field in Colorado after a series or more by either team in a colder, sea-level venue. The issues for the hitter and pitcher are the same as described above, but fortunately this VMI range lasts for only the first game of the series.

Therefore, the ball movement is far less (about 3 inches less lift on the Four-Seam) and is so different that the first game in the series is the biggest adjustment for the visiting team. So winning tends to fall toward the home team's favor. Of course, with a three game series, that makes it difficult for the visitor to win two, considering the high tendency in MLB to win today and lose tomorrow.

-8.01 to -10.00

If he is a "Reverse Pitcher," your player will probably hit his average or greater against him, because the hitters are typically setting up for the Four-Seamer from their previous exposure and, of course, this causes them to need little adjustment to pound the Two-Seamer.

If he is a "Tight Pitcher," hitters will struggle with the Four-Seam and the Slider, but will hit the slower pitches much better, including the Curveball.

"Reverse Pitchers" live dangerously close to "Loose Pitchers". When they are getting hit hard in this VMI range, they tend to switch to additional pitches, and so they tend to let the opponent "off-the-hook", instead of switching to the "Four-Seamer".

Hitters, on the other hand, are challenged beyond belief. If they transition from locations like Colorado, Texas, or Atlanta (where the team may enter this range after a game or two within even greater minus VMIs), then they can start or continue a losing streak. Every observer of baseball is quite aware of how a team can fall apart during a losing streak. The physical aspect of not being able to hit the most common pitch in baseball can--and does--create not only frustration, but greater mental issues from trying too hard. It even carries over into defensive mistakes, base running, and poor decision-making because of "over-thinking it."

In this case, the media doesn't help much, because they focus on what happened, but have no time to focus on "why" it happened, while writing one report after another.

-10.01 to -20.00

This range is normally only associated with leaving Coors Field in Colorado after a series or more there by either team. Therefore, the same is true as I mentioned in the above paragraphs, except that this is where the issues really begin. This VMI may be associated with leaving Coors Field and arriving at a Central Division opponent's venue at 500 to 1,000 feet elevation and fairly warm conditions.

If he is a "Reverse Pitcher," your player will probably hit his average or greater against him because the hitters are typically setting up for the Four-Seamer from their previous exposure. This, of course, causes them to need little adjustment to get down on the Two-Seamer.

If he is a "Tight Pitcher," hitters will struggle with the Four-Seam and the Slider, but will hit the slower pitches much better, including the Curveball.

-20.01 to -30.00

This range is only a degree greater than the same issue discussed above. It too is associated with leaving Coors Field in Colorado after a series or more there by either team, but normally this team travels directly to a colder, sea-level venue. The issues above are the same, but into a greater opposing environment in terms of ball movement.

This concludes the studies we've done on the VMI ranges and how MLB players tend to react while performing under conditions that cause the baseball to take a different track to the plate from the pitcher's hand. You should now be able to utilize "Today's Team Match-Ups," our newest BaseballVMI.com tool to its greatest advantage. Your standard membership qualifies you to utilize this tool.

Visual Memory by Clifton Neeley, creator of the Visual Memory Index© and author of the web-site www.baseballvmi.com. Clifton pitched and played baseball and fast-pitch softball in the mountainous southwest Colorado area from 4,000 feet in Grand Junction to 6,000 feet in Durango to 9,000 feet in Telluride prior to his college experience in baseball.