

**A STUDY TO DETERMINE THE FASTEST PATH FROM  
HOMEPLATE TO FIRST BASE TO SECOND BASE**

**BY**

**JAMES STUART DRISCOLL**



A STUDY TO DETERMINE THE  
FASTEST PATH FROM HOMEPLATE  
TO FIRST BASE TO SECOND BASE

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A Research Paper  
Presented to  
The Graduate Council  
of  
Austin Peay State University

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In Partial Fulfillment  
of the Requirements for the Degree  
Master of Arts  
in Education

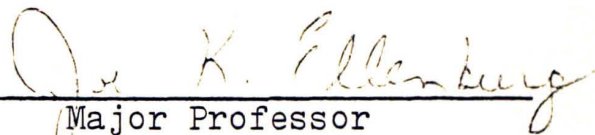
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By  
James Stuart Driscoll

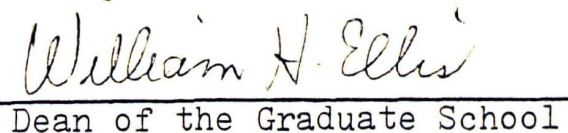
June, 1979

To the Graduate Council:

I am submitting herewith a Research Paper written by James Stuart Driscoll entitled "A Study to Determine the Fastest Path in Running from Homeplate to First Base to Second Base." I recommend that it be accepted in partial fulfillment of the requirement for the degree of Master of Arts in Education, with a major in Health and Physical Education.

  
Major Professor

Accepted for the  
Graduate Council:

  
Dean of the Graduate School

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## Chapter I

### The Problem and Definitions of Terms

#### Introduction

The best offense in baseball is an aggressive attack which is capable of exerting continuous pressure on the defense. Baserunning is the most vital factor with which to exert this pressure. This has been the trademark of some of the most successful major league teams in history, including those of the present era.<sup>1</sup> Since baserunning is of such major importance, little, if anything, should be left to chance.<sup>2</sup> We have all heard the adage that baseball is a game of inches. In the Running Game, a book by Tucci and Bader, it is suggested that coaches should swing the tide of those inches their way.

Baserunning can and must be taught.<sup>4</sup> However, before teaching baserunning, we need to possess a formal knowledge of the subject. Although some coaches and managers have professed various methods of running bases, there is very little research to illustrate any of these techniques as being the

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<sup>1</sup>Weiskopf, Don, "Aggressive Offense," Athletic Journal, Vol. 50, p. 108, March 1970.

<sup>2</sup>Watts, Lew, "Baserunning Must Be Taught," Scholastic Coach, Vol. 36, p. 26, April 1967.

<sup>3</sup>Tucci, Ruben and Bader, Richard, The Running Game, New York, The Mac Millan Co., p. 102, 1968.

<sup>4</sup>Watts, "Baserunning Must Be Taught," p. 26.



best methods. For this reason, I present the following study which researches one vital aspect of baserunning — running from homeplate to second base.

### Statement of the Problem

What is the fastest path in running from homeplate to first base to second base by the batter after he hits the ball? Three turns in rounding first base to reach second base are generally utilized: the narrow turn, the medium turn, and the wide turn.

### Hypotheses

Based on experience and observation as a coach and player and the review of literature, the following hypotheses concerning performance appear warranted.

- H 1: Slow runners will be fastest running the narrow turn.
- H 2: Players of average speed will experience their best time running the narrow turn.
- H 3: Fast runners will experience their best time on the narrow turn.
- H 4: As a whole, the subjects will run their second best time on the medium turn.

### Purpose of the Study

The purpose of this study is to present the baseball coach with information that will aid him in coaching the fastest route in running from homeplate to first base to second base after hitting the ball.

Unfortunately, baserunning has been traditionally one of the most ignored phases of the game and perhaps coached



the least. However, by utilizing aggressive baserunning, the opposition can be forced into mistakes and many times potential one or two run loses converted into victories.

One of the most vital phases of baserunning is the ability of the hitter to reach second base safely on a hit ball. Several instances may exist in which a runner will utilize the turn at first base. These include (1) a single with the possibility of an error by the outfield, (2) a double with the potential to stretch it into a triple and (3) a fly ball with the possibility of it being missed by the outfield.

There are three frequently used routes of running from home to second base. Some coaches teach their players to make as wide a turn as necessary to achieve a direct line from first base to second base as the players touch first base (The distance from homeplate to first base is 90 feet). Other coaches profess a moderate bow in running to first in an effort to curtail a wide turn after touching first base. Still other coaches stress a narrow turn only a few steps outside the baseline to reduce the total distance to be run.

The specific purpose of this study is to determine the fastest of the three frequently used running routes from homeplate to second base for both fast and slow runners as well as those players of average speed.

#### Definition of Terms

Fast Runner: A player who recorded a speed trial time (60-yard dash) of 7.0 seconds or less.

Average Speed Runner: A player who recorded a speed trial time of 7.1, 7.2, or 7.3 seconds.

Slow Runner: A player who recorded a speed trial of 7.4 seconds or more.

Speed Trial: The 60-yard dash.

Test Run: The run from homeplate to first base to second base.

Narrow Turn: The running path that started bowing out to the right 32 feet up the baseline and back in to first base with the deepest point in the bow 7 feet, at a point 67 feet up the baseline.

Medium Turn: The running path that started bowing out to the right from homeplate at a distance of 2 feet off the baseline, 15 feet up the line with the deepest point 12 feet from the baseline at 58 feet up the line from homeplate.

Wide Turn: The running path that started bowing out to the right from homeplate at a distance of 4 feet off the baseline 15 feet up the line from homeplate with the deepest point 17 feet from the baseline at 50 feet up the line from homeplate.

## Chapter II

### Review of Literature

Little research is available concerning the fastest path of rounding first base. With the exception of one finding, described by Guy Reiff, this researcher found no statistical evidence concerning the subject, only opinion. Mr. Reiff writes:

"The best method of rounding first base has been examined by several investigators. Various techniques studied have included 'rounding out' at 60 feet and touching first base with the left foot; also the same with the right foot running directly to first and turning sharply at the base; and touching first base and with both feet facing second, making a sharp 90° turn. It appears that the best method of running from home to first base is to run just outside the foul line and straight at the base until the runner can conveniently turn and approach the bag in the best position to continue to second in as straight a line as possible. Obviously, the more deviation from a straight line from first to second, the greater the increase in running time, due to the greater distance."<sup>5</sup>

Other sources of related literature include Jack Stallings who writes, "When a runner plans to round a base, he should swing out slightly to the right before he reaches the base. Where he begins to swing out is a matter of personal preference and depends mainly on the runner's agility and body control. He should...make a tight turn towards the next base."<sup>6</sup>

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<sup>5</sup>Reiff, Guy, What Research Tells the Coach about Baseball, Washington, D.C., Alliance of Health, Physical Education and Recreation, p. 30, 1971.

<sup>6</sup>Stallings, Jack, "Techniques of Base Running," Athletic Journal, Vol. 51, pp. 26-29, February, 1971.



Dave Keilitz states, "On all balls hit on the ground, the hitter should run straight at first base...the first base coach signaling the runner what to do, round the base if it goes through, etc....If the runner arced properly, then he will be headed almost directly toward second."<sup>7</sup> A picture sequence describing Keilitz's method was included, which indicated an approximate depth of 17 feet in the runner's arc.

Another author, Ken Dugan, in one article writes, "When the runner intends to round first base, he should, upon leaving the batter's box, bear slightly to the right and away from the base line, until he reaches a point at which he can turn and approach the base in good position to continue to second. By "good position", we mean facing the next base when rounding the bag. Remember, the shortest distance between two points is a straight line. The base-runner shouldn't be allowed to waste valuable time and steps when circling the bases."<sup>8</sup> Included in Dugan's book is a picture exhibiting a maximum depth in the arc of the runner as approximately seven feet (see Appendix A).<sup>9</sup> Tucci and Bader state, "We teach going from home to second base by...utilizing a slight outward dip or banana about ten feet before the runner reaches first base. Then, each bag is tagged with the inside foot on the inside corner. While traveling at full speed, this has to

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<sup>7</sup>Keilitz, David, "Base-Running," Athletic Journal, Vol. 55, p. 28, February, 1975.

<sup>8</sup>Dugan, Ken, "Heads-Up Base-Running," Scholastic Coach, Vol. 37, pp. 14-16, March 1968.

<sup>9</sup>Dugan, Ken, How to Coach and Organize Winning Baseball. West Nyack, New York, Parker Publishing Co., Inc., p. 75, 1971.



be the shortest distance around the infield. Teaching the player to use the base coach as a guide, with signals, will help the runner make his decision sooner and safer."<sup>10</sup> The article, "Baserunning - Touching Every Base," offers, "On all balls hit to the outfield, the runner should cut out into foul ground upon nearing the bag so that he can make the turn at full speed...Nothing is more important when rounding the bases than to keep in stride and good balance."<sup>11</sup> The author includes a picture describing an arc depth of approximately seven feet and a path that swings out from the baseline about thirty feet from homeplate.

Additional writings on the subject include Lew Wat's comments: "On a ball hit to the outfield, he (the runner) should swing wide about thirty feet from first and hit the inside of the bag. That will put him on a straight line to second as he makes his turn."<sup>12</sup> However, Watts appears to contradict himself to a degree when he states in his book, "He (the runner) should swing wide as he gets to within about 20 feet of the base and should hit it without breaking stride...Swinging wide before reaching the bag will enable the runner to be moving directly toward the next base...eliminating the need to take several extra steps in order to continue on to the

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<sup>10</sup>Tucci and Bader, The Running Game, p. 102.

<sup>11</sup>Toporcer, George, "Baserunning - Touching Every Base," Scholastic Coach, Vol. 36, p. 28, February, 1967.

<sup>12</sup>Watts, "Baserunning Must Be Taught," p. 26.

next base."<sup>13</sup> Another author, Ethan Allen, suggests, "If it is possible to advance past first base, the runner should bear slightly to the right and away from the baseline until a distance from the bag is reached wherein he can conveniently turn and approach the bag in good position to continue on to second base."<sup>14</sup> Allen includes a picture displaying a bow of approximately six feet. Frank DiClemente explains, "A batter who knows he can get more than one base on a hit should not slacken his speed as he approaches first base. Before touching, he should take a wide turn toward the bag."<sup>15</sup> Discussing the turn in lesser detail, Jim Martin, in his book, Keys to Successful Baserunning, writes, "The first key we teach our players is to find the position of the ball as they start down the line, thus, deciding whether their direction should be straight to the bag or get into position to round the bag."<sup>16</sup>

Finally, Don Weiskopf comments in one article, "He (the runner) must go hard for first, looking only at the bag, unless the coach signals and calls that it is through and for him to take his turn."<sup>17</sup> Weiskopf elaborates on the turn at first

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<sup>13</sup>Watts, Lew, The Fine Art of Baseball, New Jersey, Prentice-Hall, Inc., p. 289, 1964.

<sup>14</sup>Allen, Ethan, Major League Baseball, New York, The Mac Millan Co., p. 183, 1950.

<sup>15</sup>DiClemente, Frank, Baseball, Mankato, Minnesota, Educational Society, Inc., p. 191, 1960.

<sup>16</sup>Martin, Jim, "Keys to Successful Base-Running," Athletic Journal, Vol. 51, p. 60, January, 1971.

<sup>17</sup>Weiskopf, "Aggressive Offense," p. 108.

in his book when he writes, "It is all right to take a quick glance at the ball to see where it is going...When the batter sees that his hit has gone through or over the infield, he should begin circling toward first base by swerving to his right. He should approach first base at full speed, turning into the bag so that one of his feet hits the inside corner. As he hits the base from the inside, he should turn sharply as he can and head for second."<sup>18</sup> Along with Weiskopf, former major league manager Walter Alston professes, "I do not like a player to take the big, wide turn at first base."<sup>19</sup>

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<sup>18</sup>Weiskopf, Don, How to Play Baseball, St. Louis, Missouri, The Sporting News, p. 38, 1973.

<sup>19</sup>Alston, Walter and Weiskopf, Don, The Complete Baseball Handbook, Boston, Allyn and Bacon, Inc., p. 75, 1972.

### Chapter III

#### Methods and Procedures

##### Subjects

The subjects of this experiment were fifteen varsity collegiate baseball players of Austin Peay State University in Clarksville, Tennessee. The subjects ranged from eighteen to twenty-two years of age.

##### Facilities and Equipment

The test runs were conducted at Governor Park, the university baseball field. The baselines were dry and composed of a dirt-sand mixture. Each subject wore baseball spikes. The 60-yard dash was run on Astro Turf on the football field with a negligible wind factor and a dry surface. The subjects wore tennis shoes. Timing for both the speed trial and the test runs was accomplished with two stopwatches calibrated to a tenth of a second.

##### Experimental Design

The experimental design utilized in this experiment is a correlation analysis. Fifteen varsity collegiate baseball players ran the 60-yard dash and were classified in running speed as fast, average, and slow. The subjects were timed in pairs. After at least 24 hours rest following the 60-yard dash, each subject made three test runs from homeplate to



first base to second base following a different designated path on each run. The three paths included the narrow turn, the medium turn, and the wide turn. The path of each turn was determined on a trial and error basis by the researcher after a thorough review of the literature on baserunning. Each subject ran one practice run then ran the same path for time. There was a five minute interval between each test run to negate fatigue as a factor. The clock was started 15 feet up the baseline to nullify the difference in ability to get out of the batters box and to negate the difference in starting position between left and right-handed batters. The clock was stopped when each subject touched second base on a continued run.

### Evaluation

The method of evaluation was a comparison of the times of each test run for each individual. A difference of one-tenth a second was considered significant. The 60-yard dash score, then, was correlated with each test run time.

## Chapter IV

### Analysis of Results

Considering the players classified as slow, two performed best on the narrow turn, while two performed best on the medium turn. Three of the four average speed subjects recorded their best times on the medium turn. The fourth subject performed best on the narrow turn. Four of the seven "fast" players recorded their best times on the narrow turn. Two performed best on the medium turn and one best on the wide turn. The slowest runner of the entire group did best on the narrow turn and the fastest runner performed best on the wide turn.

The ratio of the number of players running the medium turn faster than the narrow turn was 7:5 (3 ties). The ratio of the number of subjects running the narrow turn faster than the wide turn was 11:4. The number of players running the medium turn faster than the wide turn was an 8:3 ratio (4 ties). In each comparison, more players ran the medium turn faster than either the narrow or the wide turns.

In comparing the mean score of the narrow turn with that of the medium turn, the difference was one-tenth second less for the medium turn. The wide turn mean was equal to that of the medium turn.

In drawing a correlation between the speed trial and the test runs for each individual at the .05 level of confidence, all three turns were positively correlated. See Table I, page 14, for comparison of speed trial time to test run times.

As shown in Table II, page 15, the narrow turn recorded the highest correlation of .780, whereas the correlation factor for the medium turn was .595 and the wide turn .634.

For further details on the running paths used for the test runs, see Figure I, page 16.

TABLE I

## Individual Results of Test Runs and Speed Trials

Subject	Narrow Turn	Medium Turn	Wide Turn	60-yard Dash
1	6.7	6.7	6.8	7.1
2	6.6	6.6	6.7	7.1
3	6.6	6.4	6.5	7.0
4	7.3	6.9	7.0	7.7
5	6.7	6.6	6.9	6.7
6	7.3	7.4	7.5	7.8
7	7.0	6.8	6.8	7.3
8	6.5	6.8	6.7	7.1
9	7.2	6.6	6.8	7.7
10	6.7	6.8	6.8	7.0
11	6.6	6.8	6.7	7.0
12	6.5	6.6	6.6	7.5
13	7.0	6.9	6.9	7.1
14	6.4	6.4	6.5	7.0
15	6.5	6.4	6.3	6.7



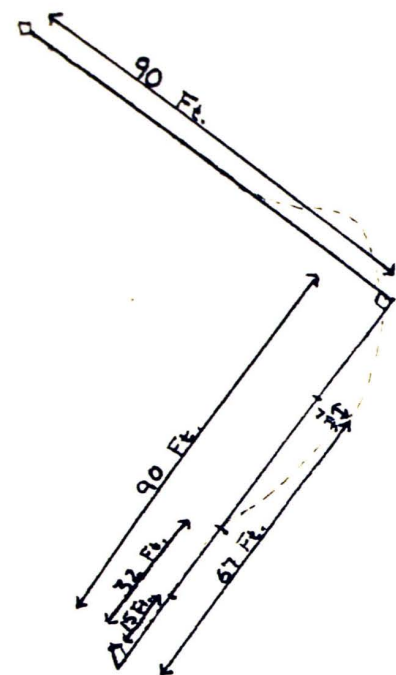
TABLE II

Correlation Matrix of the 60-yard dash  
and the Narrow, Medium, and Wide Turns

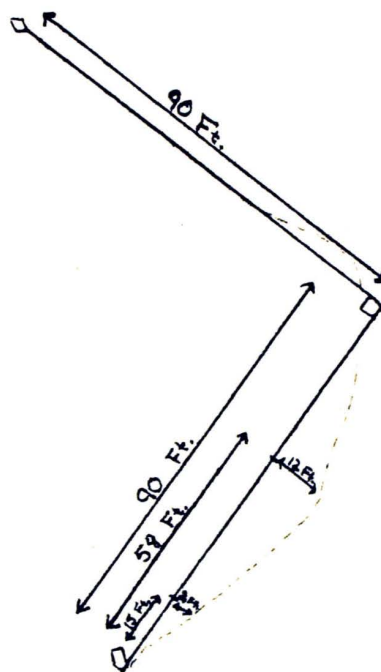
		Narrow Turn	Medium Turn	Wide Turn
<u>60-yard Dash</u>	1.000	.780	.595	.634
<u>Narrow Turn</u>	.780	1.000	.691	.785
<u>Medium Turn</u>	.595	.691	1.000	.613
<u>Wide Turn</u>	.634	.785	.913	1.000

FIGURE I

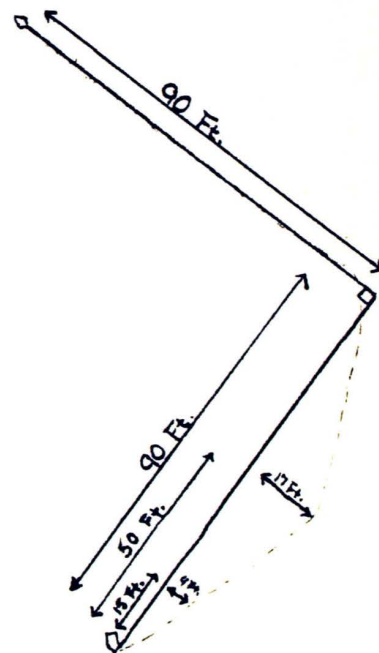
Dimensions of the Three Running Paths



NARROW TURN



MEDIUM TURN



WIDE TURN

## Chapter V

### Summary and Conclusion

The purpose of this study was to determine the fastest path from homeplate to first base to second base. The results indicated (significant within one-tenth second) that more players ran the narrow and medium paths faster than the wide path. Of the fifteen subjects, five ran the narrow turn fastest and four ran the medium turn fastest while only one recorded his best time on the wide turn. Three subjects recorded identical times in the narrow and medium turns as their fastest times and the remaining two subjects recorded ties between the medium and wide turns as their best times. Contrasting the narrow path times to those of the medium path for all subjects, the ratio of the number of players running the medium turn faster was 7:5 (3 ties). It must be noted that the straight-away speed and agility of the runner are factors that may influence the runner's fastest method. This writer suggests, because of the above items, that each ballplayer be timed on each running path to determine his best route.

Within the limitations imposed by the design of this study and the small number of subjects, the following conclusions were also drawn:

1. As a whole, slow runners are fastest on the narrow and medium turns.
2. As a whole, runners of average speed are fastest on the medium turn.

3. As a whole, fast runners record their best times on the narrow and medium turns.
4. Runners with fast straight-away speed will run all paths faster than those subjects with less speed.

The researcher of this paper recommends that further investigation be done in this area to confirm or refute these conclusions. Also, further research in this and other areas will serve to expand the scientific base which can be used to improve the play of our National Pastime.



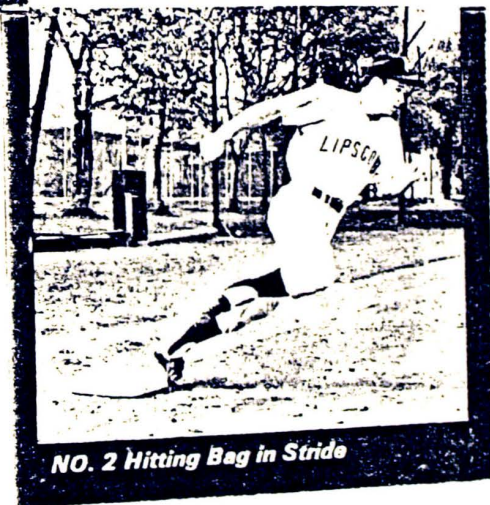
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APPENDIX A



**NO. 1, Ready for the Turn**



**NO. 2 Hitting Bag in Stride**