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***SCORING REVERSALS: A MAJOR LEAGUE DILEMMA***

**BY**

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## Abstract

Recent work shows that scoring methods (weighted voting) are very sensitive to the weights used, in theory. We analyze the results of Most Valuable Player voting in baseball as a test of the practical relevance of this work. We find that Most Valuable Player rankings are indeed quite dependent on the particular scoring method in use.

Jean-Pierre Benoit

Scoring Reversals: A Major League Dilemma

Perhaps the most common method for ranking a set of alternatives is the plurality method--each individual votes for a single choice and the alternatives are ranked by the number of votes received. Borda [1781] argued that this method is extreme in that it considers only how often an alternative is ranked at the top by some individual, paying no heed to how well the alternative fares when it is not placed first. He proposed that each individual assign points, or weights, to the alternatives -- one to the least preferred alternative, two to the second least preferred, three to the next one, and so forth -- and that the alternatives then be ranked by the total number of points received. This method is known as a Borda count.

Although Borda suggested that weights with constant differences be used, there does not appear to be any compelling reason for such an assignment. With four alternatives, why not assign weights of 1, 2, 3, and 5, for instance? There is a certain arbitrariness inherent in a Borda Count. However, this is not an arbitrariness introduced by Borda. After all, the common plurality method "arbitrarily" assigns weights of one to the top choice, and zero to all others.

Both the Borda count and plurality voting are special instances of scoring methods. With  $n$  alternatives to be ranked, a scoring method has each individual assign weights (from top to bottom) of  $w_1, w_2, \dots, w_n$  to the alternatives, where  $w_1 > w_2 > \dots > w_n$ , unless  $w_j = 0$ , in which case  $w_j = w_{j+1} = \dots = w_n$ . The alternatives are then ranked from most points received to least.

Given a set of individuals voting (sincerely) according to their preferences, we can expect plurality voting and the Borda count to result in different rankings of the alternatives. Indeed, there would be little point in introducing a Borda count if this were not the case. The basic appeal of a Borda Count, however, is that it gives weight to preferences beyond each individual's top choice, and not that it uses the specific weights suggested by Borda. Accordingly, one might hope that "minor" changes in the weights used would have little effect on the final rankings. Such a hope is in vain. Fishburn [1981] showed that given any

two different<sup>1</sup> scoring methods, a set of individuals and preferences can be found such that the rankings yielded by the two methods are exactly the opposite of each other. Saari [1984] extended this result as follows: given a set of alternatives,  $k$  arbitrary rankings of these alternatives, and  $k$  distinct scoring methods, a set of individuals and preferences can be found such that all  $k$  of the rankings are generated using the different scoring methods (with the same individual preferences). This, no matter how similar the scoring methods appear to be.

Though this finding indicates the extreme arbitrariness of scoring methods in principal, it does little to tell us if we are likely to encounter ranking reversals, i.e. changes in the rankings of alternatives, in practice for "reasonable" alterations in scoring weights. This type of question is notoriously difficult to answer. There is no clear way to place an a priori probability distribution over individual preferences<sup>2</sup>.

While we will not be able to definitively determine if ranking reversals are a serious practical problem, we hope to provide some insight by examining a situation for which considerable voting information is available -- the selection of the Most Valuable Player awards in Major League Baseball.

Major League Baseball is the most important professional baseball organization in the United States of America. Currently, its primary component is 26 teams divided into two leagues, known as the National League and the American League. These teams enjoy immense popularity, many drawing over two million, and some over three million, paying spectators a year. In addition, the teams have lucrative television contracts.

At the end of each baseball season two players, one in the National League and one in the American League are honored by being named Most Valuable Player (MVP) in their respective leagues. Although the genesis of the Most Valuable Player award

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<sup>1</sup> The scoring methods must be truly different. Two methods which use weight vectors  $w$  and  $v$ , such that  $w = sv + t(1,1,\dots,1)$  for some positive integers  $s$  and  $t$ , are equivalent and will always produce identical rankings.

<sup>2</sup> Compare efforts to determine how often the Condorcet voting paradox is likely to arise.

can be traced back to 1875, the "official" MVP trophy as we now know it has been given annually by the Baseball Writers Association of America (BBWAA) beginning in 1930. Since 1938 this honor has been determined as follows. Three writers in each city with a major league baseball team are polled (in 1961 the number was reduced to two). They are asked to list their top ten players. Each time a player appears first on a sportswriter's list, that player receives 14 points. For a second place listing a player receives 9 points. Third place is worth 8 points, fourth place is worth 7 points, and so forth down to tenth place, which is worth 1 point<sup>3</sup>.

From 1938 to 1960 there were eight National League and eight American League teams, so that the maximum number of points a player could receive was 336. From 1961 to 1968 in the American League and from 1962 to 1968 in the National League the number of teams was increased to ten. In 1969 the number of teams in each league was increased to 12, and in 1977 the number of teams in the American League was again increased, this time to 14. Currently, a unanimous first place selection gives a National League player 336 points and an American League player 392 points.

We examine MVP results for the years 1943 through 1989. Of these years, we are missing vote information for eight elections<sup>4</sup>, leaving eighty-six cases to analyze. Determining whether or not a change in scoring methods can cause a ranking reversal is a trivial task. Define  $r_{ik}$  as the number of people who rank player  $i$  at position  $k$  or higher. Player  $i$  can be ranked above player  $j$  by some scoring method if and only if  $r_{ik} > r_{jk}$  for some  $k$ . Calculating the players' positions under a variety of scoring methods requires only the patience to type numbers into a spreadsheet program. All our manipulations are carried out under the assumption that the sportswriters would not submit different rankings as the scoring methods changed.

The selection of a most valuable player involves many objective criteria, such as players' batting averages, number of home runs

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<sup>3</sup> See Deane (1988) for a more complete history of the MVP, as well as Cy Young and Rookie of the Year awards. Contained therein is a complete listing of points received by players, but insufficient information for determining reversals. These reversals were determined from additional voting data supplied by Deane.

<sup>4</sup> National League: 1946, 1948, 1949, 1950, 1951  
 American League: 1945, 1953, 1954,

hit, number of runs batted in, and so forth... . For this reason we might expect to find considerable agreement in the rankings of the various sportswriters. Indeed, there are eight instances in which one player received all the first place votes, and 40 instances in which the first place votes were distributed among three players or less. This although, the number of players in each league ranged from two hundred to three hundred and fifty for the time period in question. It is doubtful that there are many voting situations with such widespread agreement among the voters. Since reversals tend to occur when there is a large variance in voter rankings, the presence of a significant number of reversals here would indicate that their possibility does indeed constitute a practical problem.

We first consider changes in the scoring system which could have resulted in the naming of a different MVP. In 26 out of 86 cases, a change in the scoring weights could have had an effect on the player named most valuable. In one of these cases a two-way tie for first could have been broken. In two cases, a tie for first with the original winner could have been created. Nineteen times the second place finisher could have been named MVP instead of the actual winner. In five cases the third place finisher could also have been the winner. Somewhat oddly, in two instances the third place, but not the second place, finisher could have been named MVP. Similarly, twice the fourth place, but not the second or third place, finisher could have ended up first. Finally in four cases the third place finisher, in one case the fourth place finisher, and in one case the fifth place finisher could have placed ahead of the original winner with a change in the scoring method, but would have been unable to overtake the second place finisher. We will have more to say about these peculiarities later.

Our findings are displayed in Table 1, where the numbers in the columns indicate the ranking of the players who could have finished first. Numbers in brackets indicate players who could finish above the original first place winner, but only with a scoring system which would still have placed them behind the number 2 player. Note that no more than three players were ever in contention for the MVP title.

Although being named the Most Valuable Player carries considerably more prestige than any lower place finish, these other positions are also important. Many players contracts carry provisions for bonuses which depend on where they finish in the MVP balloting. In addition, their future salaries are undoubtedly affected by where they find themselves in the voting. For this reason, as well as for pure social choice

<u>Year</u>	<u>American</u>	<u>National</u>
1943	2	
44	2	2
46	2	
47	2,3 (5)	2 (3)
51	2,3 (3-way tie)	
52		3
55	2,3	2 (4)
57		2,3
58	4	
59	3	4
60	2,3	
61	2	
62		2
63		2 (3)
64		2
66		2
68		2
69		2 (2-way tie)
79		tie broken (3)
81	2	
83		2
84	2 (3)	

Years subject to first place reversals. The numbers indicate the original finishing place of a player who could have finished first with a different scoring method. Numbers in brackets are for players who could have finished above the original winner, but not first.

Table 1

theory interest, it is important to look beyond reversals in the top finish. In every single election lower place finishers were subject to ranking reversals.

Let us examine this ranking reversal phenomenon in greater detail. Table 2 lists the finishing order for all players receiving at least one point in the 1957 National League MVP balloting using five different scoring methods (see tables 5 and 6 of the appendix for the breakdown of the voting and point totals). The first column gives the official finishing order using (ten times) the weights actually in use by the Baseball Writer's Association. In the next four columns we recompute finishes using different weights. While we are interested in demonstrating ranking reversals, our goal is to examine to what extent these reversals are of practical significance. Accordingly, we have selected modified weights which are in the spirit of the original weights. In particular, we have maintained the feature that the point differential between a first and second place finish is greater than the differential for any other two adjacent positions. Ideally, we hope to have chosen weights that the BBWAA would agree "could" have been used instead of the weights actually used.

The weights used in the second column produce a crucial change -- the order of the top three finishers is exactly reversed. Other movements are of no more than one position. The next two columns have less dramatic reversals at the top but use "nicer looking" numbers. The fifth column has the sportswriters rank five rather than ten candidates, a quite plausible alternative. There are significant changes; in particular, the tenth place finisher jumps to sixth place, and the thirteenth place finisher to ninth place.

In Table 3 we list the top ten finishers with different scoring methods for the 1976 American League MVP award (see tables 7 and 8 of the appendix for the breakdown of the voting and point totals). This is a year for which the top three positions are immune to any change in weights. Nonetheless, lower finishes are subject to considerable ranking reversals.

Again, column one gives the original finishing order. Column two uses different "reasonable" weights. For comparison purposes, columns three and four use weights which were also used in Table 2. Finally, to illustrate just how dramatic a change is possible, column five uses a scoring method which probably accords too disproportional a weight to first place to be considered reasonable by the BBWAA.

## PLAYERS

1st	Aaron	<b>Schoendienst</b> (3)	<b>Musial</b> (2)	<b>Musial</b> (2)	<b>Musial</b> (2)
2nd	Musial	Musial (2)	<b>Aaron</b> (1)	<b>Aaron</b> (1)	<b>Aaron</b> (1)
3rd	Schoendienst	<b>Aaron</b> (1)	Schoend. (3)	Schoend. (3)	Schoend. (3)
4th	Mays	Mays (4)	Mays (4)	Mays (4)	Mays (4)
5th	Spahn	Spahn (5)	Spahn (5)	Spahn (5)	Spahn (5)
6th	Banks	<b>Hodges</b> (7)	Banks (6)	Banks (6)	<b>Sanford</b> (10)
7th	Hodges	<b>Banks</b> (6)	Hodges (7)	Hodges (7)	<b>Banks</b> (6)
8th	Mathews	Mathews (8)	<b>Sanford</b> (10)	Mathews (8)	<b>Hodges</b> (7)
9th	Robinson	<b>Sanford</b> (10)	<b>Robinson</b> (9)	<b>Sanford</b> (10)	<b>Bouchee</b> (13)
10th	Sanford	<b>Robinson</b> (9)	<b>Mathews</b> (8)	<b>Robinson</b> (9)	<b>Hoak</b> (11)
11th	Hoak	Hoak (11)	Hoak (11)	Hoak (11)	<b>Mathews</b> (8)
12th (tie)	Blasingame	<b>Bouchee</b> (12)	<b>Blasing.</b> (12)	<b>Blasing.</b> (12)	<b>Robinson</b> (9)
12th (tie)	Bouchee	<b>Blasingame</b> (12)	<b>Bouchee</b> (12)	<b>Bouchee</b> (12)	<b>Blasing.</b> (12)
14th	Buhl	Buhl (14)	Buhl (14)	Buhl (14)	
15th (tie)	Ennis	<b>Ennis</b> (15)	<b>Dark</b> (17)	<b>Ennis</b> (15)	
15th (tie)	Groat	<b>Groat</b> (15)	<b>Ennis</b> (15)	<b>Dark</b> (17)	
17th	Dark	Dark (17)	<b>Groat</b> (15)	<b>Groat</b> (15)	
18th	Snider	Snider (18)	<b>Thomas</b> (19)	Snider (18)	
19th (tie)	Thomas	<b>Drysdale</b> (19)	<b>Snider</b> (19)	Thomas (19)	
19th (tie)	Drysdale	<b>Thomas</b> (19)	Drysdale (19)	Drysdale (19)	
21st (tie)	McMillan	<b>McMillan</b> (21)	<b>Drott</b> (21)	<b>Drott</b> (21)	
21st (tie)	Drott	<b>Drott</b> (21)	<b>McMillan</b> (21)	<b>McMillan</b> (21)	
23rd	Hamner	Hamner (23)	Hamner (23)	Hamner (23)	
24th	Burdette	Burdette (24)	Burdette (24)	Burdette (24)	
25th (tie)	Logan	Logan (25)	Logan (25)	Logan (25)	
25th (tie)	Anderson	Anderson (25)	Anderson (25)	Anderson (25)	

## WEIGHTS

w <sub>1</sub>	140	155	155	155	100
w <sub>2</sub>	90	105	105	105	70
w <sub>3</sub>	80	65	80	80	50
w <sub>4</sub>	70	50	60	60	30
w <sub>5</sub>	60	45	55	50	10
w <sub>6</sub>	50	42	45	40	0
w <sub>7</sub>	40	39	25	30	0
w <sub>8</sub>	30	35	15	20	0
w <sub>9</sub>	20	20	10	10	0
w <sub>10</sub>	10	10	5	5	0

1957 National League MVP finishes using different scoring systems. Numbers in brackets indicate original finishes. A name in bold face indicates a player whose position has changed (including a tie being broken).

Table 2

PLAYERS

1st	Munson	Munson (1)	Munson (1)	Munson (1)	Munson (1)
2nd	Brett	Brett (2)	Brett (2)	Brett (2)	Brett (2)
3rd	Rivers	Rivers (3)	Rivers (3)	Rivers (3)	Rivers (3)
4th	McRae	McRae (4)	McRae (4)	McRae (4)	<b>Carew (6)</b>
5th	Chambl.	<b>Carew (6)</b>	<b>Carew (6)</b>	<b>Cambell (8)</b>	<b>Otis (7)</b>
6th	Carew	<b>Chambliss (5)</b>	<b>Chambliss (5)</b>	Carew (6)	<b>Fidrych (11)</b>
7th	Otis	<b>Cambell (8)</b>	Otis (7)	Otis (7)	<b>Cambell (8)</b>
8th	Cambell	<b>Otis (7)</b>	Cambell (8)	<b>Fidrych (11)</b>	<b>Mcrae (4)</b>
9th	May	May (9)	May (9)	<b>Chambliss (5)</b>	<b>Bando (13)</b>
10th	Palmer	Palmer (10)	Palmer (10)	<b>Bando (13)</b>	<b>May (9)</b>

WEIGHTS

w <sub>1</sub>	140	180	155	100	150
w <sub>2</sub>	90	150	105	70	60
w <sub>3</sub>	80	130	80	50	40
w <sub>4</sub>	70	80	60	30	10
w <sub>5</sub>	60	70	50	10	5
w <sub>6</sub>	50	60	40	0	0
w <sub>7</sub>	40	50	30	0	0
w <sub>8</sub>	30	40	20	0	0
w <sub>9</sub>	20	30	10	0	0
w <sub>10</sub>	10	20	5	0	0

Top ten 1976 American League MVP finishes using different scoring systems. Numbers in brackets indicate original finishes. A name in bold face indicates a player whose position has changed

Table 3

In column five we find that Mark "the Bird" Fidrych, who finished eleventh initially, has moved ahead of fourth place finisher Hal McRae. Despite this reversal, however, no change in the scoring method could have enabled Fidrych to overtake seventh place finisher Amos Otis<sup>5</sup>. This illustrates the rather haphazard nature of scoring methods. The rankings depend not only on how well a candidate does "overall", but also on just how the votes happen to be distributed. We saw a similar peculiarity in Table 1, where in some cases third, fourth and fifth place finishers could overtake the MVP winner, but could not overtake the second place finisher, while other times the number two finisher could never win although lower place finishers could.

We consider this dependence on the precise vote distribution further. Reversals tend to occur when the voting is close, so that a large point differential is a good indication that no reversals are possible, and a slim margin of victory is a good indication that a reversal may be possible -- a good indication, but far from a certainty.

Thus, in Dale Murphy's easy 1983 victory he received 318 points to Andre Dawson's 213 points and Mike Schmidt's 191 points. A look at the vote breakdown in Table 4 confirms the impression that Murphy was a solid winner. Indeed, his selection was nearly unanimous. Nonetheless, a different scoring method (albeit a significantly different one) could have resulted in the naming of Dawson as MVP instead.

Compare Mickey Mantle's 1957 MVP selection with a 24 point differential (233 points to Ted Williams' 209 points, and Sievers' 205). Although Mantle's margin of victory was less than Murphy's, and the vote breakdown (Table 4) appears to make him a less convincing winner, no change in the scoring system could deprive him of his victory.

Perhaps even more dramatic is Yogi Berra's 1951 crowning (Table 4). Though a pure plurality would have resulted in a three way tie, no other scoring method could have deprived him of sole possession of the MVP title, despite the fact that the voting was quite close.

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<sup>5</sup> This can easily be seen from the voting table in the Appendix

**1983 National League**

Player	1	2	3	4	5	6	7	8	9	10	Total
1. Murphy, D.	21	2	.	.	1	.	.	.	.	.	318
2. Dawson, A.	1	16	6	1	.	.	.	.	.	.	213
3. Schmidt, M.	1	5	9	7	1	1	.	.	.	.	191

**1957 American League**

	1	2	3	4	5	6	7	8	9	10	Total
1. Mantle, M.	6	9	5	4	.	.	.	.	.	.	233
2. Williams, T.	5	5	7	5	.	.	.	.	1	1	209
3. Sievers, R.	4	6	6	1	6	.	1	.	.	.	205

**1951 American League**

	1	2	3	4	5	6	7	8	9	10	Total
1. Berra, Y.	6	5	.	4	1	2	1	1	2	.	184
2. Garver, N.	6	2	3	2	1	.	1	1	.	4	157
3. Reynolds, A.	6	2	2	.	.	.	1	1	.	.	125

The vote distribution for the top three finishers in selected years.

Table 4

Thus, the possibility, or lack thereof, of a first place reversal is not a good gauge of the decisiveness of a player's victory. Rather, reversals may simply reflect the happenstance of the vote allocation.

As we have said, for the period 1943-1989, there are 26 instances when a change in the scoring system would have resulted in a different MVP. If we divide this time period into two intervals (with 42 elections in one, 44 elections in the other<sup>6</sup>), we notice something striking. Of the 26 first place reversals, 20 occur from 1943-1967, whereas only 6 take place between 1968 and 1989.

This difference may be due to the increased media attention given to the selection of the Most Valuable Players in more recent years. The widespread press discussion of who should be selected as the National and American League MVPs in the months preceding the end of the baseball season results in a kind of consensus being reached by the end of the season, reducing the possibility of a first place reversal<sup>7</sup>. This explanation is supported by the fact that of the forty times that three players or less have received all the first place votes, twenty six occur since 1968. Furthermore, from 1968 on all but three MVP winners have received at least five more first place votes than anyone else. Prior to 1968, seventeen MVPs had first place vote differentials of less than five (three even received fewer first place votes than another candidate).

### Conclusion

From Condorcet's discovery of voting cycles through Arrow's impossibility theorem to more recent work on scoring methods, Social choice theorists have shown that voting procedures may display anomalies. They have had somewhat less success, however, in determining how much of a problem these theoretical difficulties pose in practice. We have taken a modest step in that direction.

We have found that MVP voting displays a significant sensitivity to the particular scoring weights which happen to be in use.

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<sup>6</sup> Recall that we are missing data for eight elections.

<sup>7</sup> This explanation was suggested to me by Gary Cohen, radio announcer for the New York Mets.

Furthermore, this sensitivity itself is dependent on the particular way in which votes happen to be distributed. Certainly, both these features of scoring methods could have been demonstrated more starkly with specially constructed examples. Our interest, however, is in the fact that these theoretical possibilities have been realized.

Although we do not claim that every instance of a ranking reversal occurs with a "reasonable" change in scoring methods, our findings suggest that the phenomenon of reversals is of practical concern. In an case, reversals may be of some concern to Mickey Mantle. As impressive as his three MVP titles were, he could just as easily have been a five-time winner without having scored a single extra run. All he needed was a change in the scoring method<sup>8</sup>!

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<sup>8</sup> Mantle was a unanimous winner in 1956 and an overwhelming selection in 1962. As previously noted, he won less convincingly in 1957. In all three of his victories his title was immune to scoring changes. In 1960 and 1961 he finished a close second to Roger Maris; both finishes could have been reversed with different scoring weights.

## REFERENCES

1. B. Deane, Award Voting, Society for American Baseball Research, 1988.
2. P. Fishburn, Inverted Orders for Monotone Scoring Rules, Discrete Appl. Math. 3 (1981), 27-36.
3. D. G. Saari, The Ultimate of Chaos Resulting from Weighted Voting Systems, Advances in Appl. Math. 5, (1984), 286-308.

Appendix

BBWAA MOST VALUABLE PLAYER  
VOTE TALLY - 1957 National League

Name	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	Tot.
1. Aaron, Braves	9	2	6	5	2	.	.	.	.	.	239
2. Musial, Cards	5	9	9	1	.	.	.	.	.	.	230
3. Schoendienst	8	7	3	1	.	1	1	2	.	.	221
4. Mays, Giants	1	5	4	7	4	2	.	.	.	.	174
5. Spahn, Braves	1	.	2	5	6	4	1	2	.	.	131
6. Banks, Cubs	.	.	.	2	2	2	2	.	6	4	60
7. Hodges, Dodgers	.	.	.	1	1	1	1	6	3	4	54
8. Mathews, Braves	.	.	.	.	2	1	4	3	1	1	45
9. Robinson, Redlegs	.	.	.	.	3	2	.	1	.	.	42
10. Sanford, Phils	.	1	.	1	.	2	1	2	1	1	39
11. Hoak, Redlegs	.	.	.	.	3	2	.	1	.	.	31
12. Blasingame, Cards	.	.	.	.	1	3	1	.	.	1	26
Bouchee, Phils	.	.	.	1	1	.	1	1	2	2	26
14. Buhl, Braves	.	.	.	.	.	2	.	1	1	.	15
15. Ennis, Cards	.	.	.	.	.	.	2	1	1	.	13
Groat, Pirates	.	.	.	.	.	.	1	.	3	3	13
17. Dark, Cards	.	.	.	.	.	1	.	1	2	.	13
18. Snider, Dodgers	.	.	.	.	.	.	2	.	.	2	10
19. Thomas, Pirates	.	.	.	.	.	1	.	1	.	.	8
Drysdale, Dodgers	.	.	.	.	.	.	2	.	.	.	8
21. McMillan, Redlegs	.	.	.	.	.	.	.	1	1	1	6
Drott, Cubs	.	.	.	.	.	.	1	.	1	.	6
23. Hamner, Phils	.	.	.	.	.	.	.	1	.	.	3
24. Burdette, Braves	.	.	.	.	.	.	.	.	.	2	
25. Logan, Braves	.	.	.	.	.	.	.	.	.	1	1
Anderson, Phils	.	.	.	.	.	.	.	.	.	1	1
	.	.	.	.	.	.	.	.	.	.	.

Table 5

## POINTS

Aaron	2390	2335	2495	2485	1510
Musial	2300	2355	2500	2500	1610
Schoendienst	2210	2371	2375	2385	1470
Mays	1740	1554	1730	1700	900
Spahn	1310	1082	1180	1145	410
Banks	600	512	450	440	80
Hodges	540	525	350	380	40
Mathews	450	423	315	335	20
Robinson	420	376	315	315	20
Sandford	390	378	325	330	100
Hoak	310	254	270	250	30
Blasingam	260	220	220	205	10
Bouchee	260	229	185	190	40
Buhl	150	139	115	110	0
Ennis	130	133	75	90	0
Groat	130	129	70	75	0
Dark	120	117	80	80	0
Snider	100	98	60	70	0
Thomas	80	77	60	60	0
Drysdale	80	78	50	60	0
McMillan	60	65	30	35	0
Drott	60	59	35	40	0
Hamner	30	35	15	20	0
Burdette	20	20	10	10	0
Logan	10	10	5	5	0
Anderson	10	10	5	5	0

## WEIGHTS

w <sub>1</sub>	140	155	155	155	100
w <sub>2</sub>	90	105	105	105	70
w <sub>3</sub>	80	65	80	80	50
w <sub>4</sub>	70	50	60	60	30
w <sub>5</sub>	60	45	55	50	10
w <sub>6</sub>	50	42	45	40	0
w <sub>7</sub>	40	39	25	30	0
w <sub>8</sub>	30	20	15	20	0
w <sub>9</sub>	20	20	10	10	0
w <sub>10</sub>	10	10	5	5	0

1957 National League -- Total points received by players using different scoring weights.

Table 6

BBWAA MOST VALUABLE PLAYER  
VOTE TALLY - 1976 American League

Name	1	2	3	4	5	6	7	8	9	10	Total
T. Munson, Yankees	18	4	2	.	.	.	.	.	.	.	304
G. Brett, Royals	2	14	7	1	.	.	.	.	.	.	217
M. Rivers, Yankees	1	6	6	5	3	2	.	.	.	1/2	179.5
H. McRae, Royals	.	.	1	6	1	3	3	4	2	.	99
C. Chambliss, Yankees	.	.	.	3	2	3	4	1	12	1/2	71.5
R. Carew, Twins	1	.	1	.	3	.	4	3	2	2	71
A. Otis, Royals	1	.	.	1	3	2	1	1	1	.	58
B. Campbell, Twins	.	.	3	2	1	.	.	2	2	2	56
L. May, Orioles	.	.	1	.	2	3	2	1	1	3	51
J. Palmer, Orioles	.	.	.	2	3	2	.	1	.	1	31
M. Fidrych, Tigers	1	.	.	1	.	1	1	2	2	1	41
J. Rudi, A's	.	.	.	1	2	2	.	.	2	2	35
S. Bando's, A's	.	.	1	1	2	.	.	1	.	1	31
C. Yasterzemski, Red Sox	.	.	1	.	.	.	2	2	1	2	26
F. Tanana, Angels	.	.	.	.	.	1	3	.	.	2	19
R. Jackson, Orioles	.	.	1	.	.	1	1	.	.	.	17
G. Nettles, Yankees	.	.	.	.	1	.	1	1	2	.	17
G. Tenace, A's	.	.	.	1	.	.	.	2	.	.	13
R. Fingers, A's	.	.	.	.	1	.	1	.	.	2	12
V. Blue, A's	.	.	.	.	.	1	.	.	2	1	10
E. Figueroa, Yankees	.	.	.	.	.	1	.	.	2	.	9
S. Lyle, Yankees	.	.	.	.	.	1	.	1	.	.	8
R. LeFlore, Tigers	.	.	.	.	.	.	1	.	1	.	6
M. Littell, Royals	.	.	.	.	.	1	.	.	.	.	5
R. Carty, Indians	.	.	.	.	.	.	.	1	1	.	5
R. White, Yankees	.	.	.	.	.	.	.	1	.	.	3
L. Tiant, Red Sox	.	.	.	.	.	.	.	.	1	1	3
J. Mayberry, Royals	.	.	.	.	.	.	.	.	.	1	1
B. Wynegar, Twins	.	.	.	.	.	.	.	.	.	1	1

Table 7

POINTS

Munson	3040	4100	3370	2180	3020
Brett	2170	3450	2400	1560	1430
Rivers	1795	2600	1797.5	1000	815
McRae	990	1230	800	240	105
Chambliss	715	880	562.5	110	40
Carew	710	940	595	180	205
Otis	580	710	505	160	175
Cambell	560	800	480	220	145
May	510	680	405	70	50
Palmer	470	560	380	90	35
Fidrych	410	530	350	130	160
Rudi	350	440	270	50	20
Bando	310	410	265	100	60

WEIGHTS

w <sub>1</sub>	140	180	155	100	150
w <sub>2</sub>	90	150	105	70	60
w <sub>3</sub>	80	130	80	50	40
w <sub>4</sub>	70	80	60	30	10
w <sub>5</sub>	60	70	50	10	5
w <sub>6</sub>	50	60	40	0	0
w <sub>7</sub>	40	50	30	0	0
w <sub>8</sub>	30	40	20	0	0
w <sub>9</sub>	20	30	10	0	0
w <sub>10</sub>	10	20	5	0	0

1976 American League -- Total points received by players using different scoring weights.

Table 8

## REFERENCES

1. J.C. de Borda, Memoire Sur les Elections an Scrutin, *Histoire de l'Academie Royale des Sciences*, (1781), Paris
2. B. Deane, Award Voting, *Society for American Baseball Research*, 1988.
3. P. Fishburn, Inverted Orders for Monotone Scoring Rules, *Discrete Appl. Math.* **3** (1981), 27-36.
4. D. G. Saari, The Ultimate of Chaos Resulting from Weighted Voting Systems, *Advances in Appl. Math.* **5**, (1984), 286-308.