THE BAKER SYSTEM: AN ALTERNATIVE
FOR LEAGUE BOWLING

by

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B. S., University of Wisconsin - LaCrosse, 1972

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A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Health, Physical Education and Recreation

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1977

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Chapter 1

INTRODUCTION

In order to set the tone for this study, a look at the origin and development of the game of bowling is necessary. In addition, the philosophy of competition will be addressed. A statement of the problem, delimitations, limitations, and definitions will also be presented in this chapter.

Bowling

While examining a grave of an Egyptian child believed to have died in 5200 B.C., Sir Flinders of Petrie discovered equipment used in playing a game very similar to our modern tenpins. His discovery consisted of nine variously shaped pieces of stone, used as pins, and a round stone which served as the ball.[1]

Throughout history, various forms of pin games flourished. These games spread through all parts of Europe. Each area had its own rules and type of equipment for playing the game. As few as three pins and as many as seventeen pins were used.[2]

In America, the first reference to bowling was found in Washington Irving's Rip Van Winkle in 1818. By the 1850's bowling

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[1]National Bowling Council, The Bowling Instructor's Handbook, 1974, p. 10.

[2]Ibid.

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had become so popular in the United States that indoor lanes were built in areas of large German populations.[3]

In order to establish some standards for the game in regard to playing rules and equipment, an organization called the National Bowling Association was formed in 1875. However, this group was unable to gain needed support. In 1890, the American Amateur Union tried to govern the organizational aspects of the game, but also failed.

On September 9, 1895, the American Bowling Congress was organized in New York City. Standardized rules and equipment specifications were developed and accepted. To this date, bowling is still played by the guidelines which were set up over eight decades ago and the American Bowling Congress (ABC) continues to be the ruling body for the game.

The game of bowling continued to grow in popularity during the early 1900's. In 1916, a group of women met in St. Louis to form an organization called the Women's National Bowling Association. This organization was established to promote interest in women's bowling. The Women's National Bowling Association has evolved into the Women's International Bowling Congress (WIBC), the current organization for women's bowling.

Total participation in the game of bowling is quite wide spread. A Nielsen survey indicated that 44.4 million people participated in bowling in 1976. This ranked bowling fifth in total sport participation behind swimming, bicycling, fishing, and camping.[4] A Harris survey taken

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[3]Ibid., pp. 10-15.

[4]"How Americans Pursue Happiness," U.S. News and World Report, May 23, 1977, p. 63.

in 1975 showed that 65 million people bowled at least once that year.

This represented a twenty-five percent increase over Harris' 1971

survey. In addition, bowling was selected as the leading year-round,

all-weather participation sport by Americans eighteen years of age and

over.[5]

Even though an exact total participation figure is quite diffi-

cult to ascertain, it is obvious that many Americans participate in the

game of bowling. It is not surprising, then, that organized leagues

have grown throughout the years. ABC membership reached the three

million figure in 1957 and hit four million two years later. A peak

in ABC membership was reached in 1964 when 4,575,000 men participated

in organized league bowling. A downward trend was seen until 1971 when

a turn-around began. An increase has been realized since then with the

1976-77 season reaching a new high of 4,583,460 members. WIBC also set

a new all-time membership high in 1976-77 with 4,043,631 members.

Following suit, the American Junior Bowling Congress (AJBC) had a record

membership during the same season. By combining the ABC, WIBC, and AJBC

membership figures for 1976-77, it is seen that nearly 9.5 million men,

women, and children participated in organized bowling.[6]

League bowling is the backbone of the bowling business, and

proprietors attempt to draw league bowlers to their centers for league

play week after week and year after year. Not many years ago the ABC

and WIBC recognized only men's and women's leagues and considered mixed

leagues under the "other" classification. However, in the past few years,

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[5]"Survey for NBC Shows Bowlers Growing Group," The Woman Bowler,
February, 1976, p. 44.

[6]"ABC Membership Reaches Alltime Record," Bowling, October,
1977, p. 16.

the bowling industry has found that mixed leagues make up the greatest percentage of sanctioned leagues. Mixed leagues have resulted in a great boost for the game of bowling. The rise of mixed leagues seems to indicate that people bowl more for the recreational value of the game than for the competitive value.

Steele surveyed two hundred forty-one regular league bowlers as to why they bowled and found the following:[7]

Cartharsis	38%
Relaxation and recreation	32%
Identity generation, reinforcement, and expression	46%
Affiliation	77%
Separation	15%
Status and prestige	5%

It can be seen that bowling is quite wide-spread as a leisure activity in the United States. The importance of leisure is obvious in today's society. In 1977 Americans will spend nearly 160 billion dollars on leisure and it is estimated that 300 billion dollars will be spent in 1985.[8] The bowling industry will be sure to prosper if Americans continue to spend their money in pursuit of leisure.

There is concern that the league format used in men's, women's, and mixed leagues is too much the same on all levels. The traditional league format involves each bowler rolling a complete game, consisting of ten frames. The individual games of each bowler are then added together in order to reach the team total. The emphasis with this format

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[7]Paul D. Steele, "The Bowling Hustler: A Study of Deviance in Sport," Social Problems in Athletics, ed. Daniel M. Landers (Urbana: University of Illinois Press, 1976), p. 89.

[8]"How Americans Pursue Happiness," U.S. News and World Report, May 23, 1977, p. 62.

is on the individual. Competition is a key element of traditional league bowling.

Frank K. Baker devised the Baker system of scoring in the 1950's while he was Executive Secretary of the American Bowling Congress. This system involves the lead-off person bowling frames one and six, the second person bowling frames two and seven, and so forth. Baker developed his system after the professional National Bowling League failed because of its lack of spectator appeal. It was felt that the traditional system was too tedious for the average spectator to follow. Baker also felt that the five-person team concept in league play was deteriorating.[9]

After developing his new system, Baker confronted the Professional Bowler's Association regarding the possibility of forming a new league using the Baker system but was unsuccessful in his attempt. Similarly, the American Bowling Congress did not consider utilizing the new format. Thus, the unused Baker scoring system was set aside.

In the early 1970's, the National Bowling Council initiated plans for a Bowling Spectacular, involving professional, amateur, collegiate, and military bowlers. The Baker system was given considera-tion as a format to be used in the Collegiate Division of this tourna-ment. In 1974, various colleges and universities, including Kansas State University, experimented with the Baker format in order to assess reactions to this untested, twenty year old system. As a result, the unique Baker format was accepted and was used in the 1975 Bowling

[9]Mort Luby, Jr., "Remembering F. K. B.," The National Bowlers Journal and Billiard Revue, June, 1975, p. 49.

Spectacular during the final twelve games to determine the National Collegiate Team Champions.[10]

The bowlers felt that the Baker system emphasized the idea of performing as a team by capitalizing upon each other's strikes and spares for team count. They felt that the system brought out the best in each bowler for the good of the team.[11]

The Baker system was again used in the 1976 and 1977 Bowling Spectaculars to determine the Collegiate Team Champions. However, there are no indications to date that the Baker system has ever been used in a league situation.

Competition

The cooperation among team members is essential to the success and enjoyment of the Baker scoring system. Success and failure during competition often depends upon the social nature of the particular activity. Sherif contends that the social interaction of participants lessens the competitiveness of an activity. In fact, the word competition comes from a Latin verb meaning "to seek together."[12]

On the other hand, competition, by its nature, produces as many losers as winners. People who lose consistently have a tendency to drop out of a particular activity. It is often said that a person gains psychologically through winning but very little is said about the

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[10] "Now, For a Change of Pace," The National Bowlers Journal and Billiard Revue, June, 1975, p. 49.

[11] "'Wow' is Reaction of Collegians," The Woman Bowler, May/June, 1975, p. 52.

[12] Carolyn W. Sherif, "The Social Context of Competition," Social Problems in Athletics, ed. Daniel M. Landers (Urbana: The University of Illinois Press, 1976), p. 19.

negative effects of losing. It follows that further assessment of the win/lose idea of competition is needed.[13]

Due to the psychological effects felt in competitive sport, individuals seek competition on their own level. During the learning stages, for instance, noncompetitive situations are often sought out in an effort to increase ability. Success in competition increases a person's desire to participate, while failure decreases that desire. Competition becomes more intense when extrinsic rewards are at stake. Also, in groups in which the abilities of the members are quite different, the intensity of competition will lessen.[14]

Statement of the Problem

The development of a bowling league format which utilizes a team rather than individual effort, and the comparison of team results and individual averages between the traditional and Baker league systems are the purposes of this study. To accomplish these purposes, the Baker system of scoring will be utilized in a handicap league format.

The new league format will hopefully meet three objectives. First, it will give a bowler another alternative to league bowling. Next, the system will allow for closer team standings, thereby diminishing the likelihood of teams dropping lower and lower in the standings and losing interest in bowling altogether. Finally, because of the manner in which the Baker system is set up, individual pressure and individual

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[13]"The Competitive Question," _Parks and Recreation_, August, 1975, p. 15.

[14]Rainer Martens, "Competition: In Need of a Theory," _Social Problems in Athletics_, ed. Daniel M. Landers (Urbana: The University of Illinois Press, 1976), p. 15-16.

recognition will be reduced which will foster socialization rather than competition.

Delimitations

This study utilized the K-State Union Recreation Area Lanes. The league consisted of eight teams which bowled a single round robin schedule. Teams were made up of five bowlers, three men and two women or three women and two men. League competition took place once a week for seven consecutive weeks. The Baker scoring system was used with handicaps figured on seventy percent of the difference between team per game averages.

Limitations

Participants were bowlers who signed up for this particular league on an individual or team basis. There were no guidelines as to bowling average or bowling experience. The researcher had no control over having the same forty people present for each league session.

Definitions

The following definitions should be kept in mind in order to fully understand this study:

Baker scoring system: Each of the five team members bowl two frames of each team game which consists of ten frames. Rotation will be as follows:

First bowler.........Frames 1 & 6
Second bowler........Frames 2 & 7
Third bowler.........Frames 3 & 8
Fourth bowler........Frames 4 & 9
Fifth bowler.........Frames 5 & 10

Handicap league: League in which the lower average team in each match receives additional pins (a handicap) for each game in order to equalize team abilities.

Traditional league: Each person bowls a complete game and these individual scores are added to reach a team total.

Summary

Bowling has been traced back to 5200 B.C. when pins and balls were made of stone. Today, millions of people enjoy the sport on an occasional basis with 9.5 million people bowling in sanctioned leagues. The traditional system of scoring has been used over the years in league competition. The use of the Baker scoring system in tournament play may be the impetus needed for further use in weekly league competition. This competition should not be viewed simply as a win/lose venture, but instead as a means of social interaction and enjoyment.

Chapter 2

PROCEDURES

The procedures followed in this study included the development of a workable format for using the Baker scoring system in league competition so that weekly team standings and final individual averages could be compared to corresponding figures of the traditional league format. Also, a post league survey of the participants was developed.

Baker League Development

A workable format was devised which incorporated the Baker scoring system into league play. Five people comprised a team with each person bowling two frames per game as follows:[1]

```
First Bowler.....................Frames 1 & 6
Second Bowler....................Frames 2 & 7
Third Bowler.....................Frames 3 & 8
Fourth Bowler....................Frames 4 & 9
Fifth Bowler.....................Frames 5 & 10
```

In order to comply with the traditional league play format, each person bowled thirty frames per league session. This equaled three traditional games per person. Teams bowled fifteen games each meeting.

A procedure was devised to utilize the eleventh and twelveth frames of each game in order for each person to bowl only thirty frames during a league meeting. The bonus balls which are normally awarded for a strike or spare in the tenth frame were standardized for all

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[1]"LaCrosse, Rich in Tenpin Tradition, Wins College Title," Bowling, June, 1975, p. 35.

teams. This involved giving a team a seven/spare after a tenth frame strike, or a seven pin count after a tenth frame spare.

In order to award teams points for wins, a point system was devised for assessing team standings such that one point was awarded for each game won. A total of fifteen points was at stake during a team match.

In order to determine individual averages, a system had to be devised which was simple enough for the bowler to figure himself and accurate enough to be recognized as a legitimate and usable average. To accomplish these goals a system utilizing strikes and spares was developed. Actual scores of games bowled with the total number of strikes and spares for each of the games were recorded.

Strikes and spares were counted as one mark each for the purpose of this system. Marks were not taken away for poor counts after strikes and spares, nor were bonus marks given for two or more strikes in a row. It was hoped that by recording enough actual scores/marks in each scoring category, trends would develop so that poor pin counts and two or more strikes in a row would be factored into the actual total marks for a particular average range.

After recording hundreds of score/mark totals, the scale found in Figure 1 was established.

AVERAGE	MARKS PER GAME
75 and below	.99 and below
76-85	1.0 - 1.99
86-95	2.0 - 2.49
96-105	2.50 - 2.99
106-115	3.0 - 3.59
116-125	3.60 - 4.55
126-135	4.56 - 5.34
136-145	5.35 - 5.79
146-155	5.80 - 6.36
156-165	6.37 - 7.24
166-175	7.25 - 7.70
176-185	7.71 - 8.50
186-195	8.51 - 9.30
196 and over	9.31 & over

Figure 1

Average/Marks Per Game Scale

By using the above scale, averages for individuals were figured.

In order to account for vacancy (blind) scores, a procedure was established similar to traditional league vacancy policies. This procedure involved taking the average of the absent bowler minus ten pins. For example, if the absent bowler had a 140 average, ten pins were subtracted which made the vacancy score 130. To record this score on a frame by frame basis, a 3/spare was given to this particular bowler each time it was his turn to bowl. If a team did not have a bowler with an established average for vacancy score purposes, a score of 120 was used. This was scored 2/spare.

For the purpose of recording team scores, traditional telescore sheets were used. A new format was developed for the recap sheet which is turned into the league secretary. Also, the league and individual standing sheet and the team and individual record sheet were revised.

The recap sheet had to be revised for two reasons, to record the total number of marks for each bowler and to record the fifteen team games. Figure 2 shows the recap sheet which was developed.

Figure 2

Baker League Recap Sheet

As for the weekly league standing and individual average sheet, a revised format was also established. As example of this is shown in Figure 3.

LEAGUE NAME_____

LEAGUE PRESIDENT_____ PHONE_____

LEAGUE SECRETARY_____ PHONE_____

WEEK OF_____

Team Standings	Hi Game	Hi Series	Won	Lost	Games	Total Pins	Average
1							
2							
3							
4							
5							
6							
7							
8							

Name	Average	Total Marks	Games	Marks Per Game Ave.

Figure 3

Baker League Standing and
Individual Average Sheet

The record sheet which the league secretary used to keep track
of team and individual results was also adapted. A sample can be seen
in Figure 4.

Team or Individual

Name _____

Date	Ave.	Marks	Cum. Marks	Mark Ave.	Games	Pins	Total Pins	High Game	High Series

Figure 4

Baker League Record Sheet

Once league procedures were set, individuals were recruited to
bowl. The league was advertised as an experimental league using a
new format. The Baker scoring system was explained to each person who
inquired about the league. The handout given to interested people can
be seen in Figure 5.

The following are special rules which will be used in the University Mixed II league.

1. Teams will consist of 5 bowlers - 3 men and 2 women or 2 men and 3 women.

2. Each team will bowl fifteen team games per night of bowling.

3. Each bowler will bowl two frames of each game or a total of 30 frames per night. (This is equal to three games per night).

      First bowler bowls frames 1 & 6
      Second bowler bowls frames 2 & 7
      Third bowler bowls frames 3 & 8
      Fourth bowler bowls frames 4 & 9
      Fifth bowler bowls frames 5 & 10

4. Any time a bowler strikes in the tenth frame, the 11th frame will be scored 7/spare. Any time a bowler spares in the tenth frame, the 11th frame will be scored 7.

5. A total of 15 teams points will be available each night of bowling. There will be no points awarded for total series.

6. This is a handicap league.

7. Have a question? See Terri or Bob.

8. Try this new league format, you'll like it!!

Figure 5

University Mixed II League Rules

After recruiting enough bowlers to fill the league, a league meeting was held prior to the first night of league bowling. At this meeting bowlers were informed of the background information regarding the development of the Baker scoring system. So that the bowlers would have a copy of the written guidelines of this league, the information sheet found in Figure 6 was distributed and explained at the league meeting.

1. Teams will consist of 5 bowlers (3 men, 2 women or
    2 men, 3 women).

2. Each team will bowl fifteen team games per night of
    bowling.

3. Each bowler will bowl two frames of each game or a
    total of 30 frames per night. (This is equal to
    three games per night).

          First bowler bowls frames 1 & 6
          Second bowler bowls frames 2 & 7
          Third bowler bowls frames 3 & 8
          Fourth bowler bowls frames 4 & 9
          Fifth bowler bowls frames 5 & 10

4. Anytime a bowler strikes in the tenth frame, the 11th
    frame will be scored 7/spare. Anytime a bowler spares
    in the tenth frame, the 11th frame will be scored 7.

5. A total of 15 teams points will be available each night
    of bowling. There will be no points awarded for
    total series.

6. Handicaps will be figured on a team basis as follows:

    A. Add the averages of the five team members on each team.
    B. Subtract the lower team average from the higher team
        average.
    C. Divide this number by 5.
    D. Multiply this number by 70%.
    E. This is the per game handicap for the team with the
        lower team average.

    EXAMPLE: TEAM A   TEAM B
                    130   110
                    120   150
                    150   110
                    110   170
                    150   160
                    ───   ───
                    660   700

      700
     -660   40 ÷ 5 = 8   8 x 70% = 5.6
      ───
       40

    The handicap for Team A is 5 pins per game.

7. Vacancy (blind) bowlers will be scored as follows: average
    of regular bowler minus 10 pins.

Example: Average =   140
                           -10
                           ———
                           130

This particular bowler would receive 3/spare each time it is his/her turn to bowl.

8. If a team does not have enough bowlers on its roster for a full line-up, a blind score of 120 shall be used. This will be scored 2/spare.

9. In filling out the recap sheet, please fill in all spaces.

10. The column labeled "marks," must be filled out at the end of each night. This is extremely important so that I can figure averages for each bowler.

    Each strike and each spare shall be counted as one mark. Averages will be determined by using the following marks per game scale:

AVERAGE	MARKS PER GAME
70	.99 and below
80	1.0 – 1.99
90	2.0 – 2.49
100	2.50 – 2.99
110	3.0 – 3.59
120	3.60 – 4.55
130	4.56 – 5.34
140	5.35 – 5.79
150	5.80 – 6.36
160	6.37 – 7.24
170	7.25 – 7.70
180	7.71 – 8.50
190	8.51 – 9.30
200	9.31 & over

DATE 6-1-77 LEAGUE UNIV MIX II LANES 1 & 2

TEAM No-Names

HANDICAP PER GAME 5

game (circle points won, slash points tied)

AVE	BOWLER	MARKS	1	2	3	4	5
130	Sue Jones	15	136	153	110	(172)	(153)
			6	7	8	9	10
120	Bill Jones	13	135	(126)	102	(112)	(172)
			11	12	13	14	15
150	Jean Gray	18	(143)	(172)	112	153	(146)
110	Sam Gray	10					
150	Joan Anderson	19					
660	captain Sue Jones						

TOTAL POINTS WON 9

TEAM The Others

HANDICAP PER GAME 0

game (circle points won, slash points tied)

AVE	BOWLER	MARKS	1	2	3	4	5
110	Craig Bills	9	(145)	(162)	113	167	155
			6	7	8	9	10
150	Judy Johnson	18	148	125	(117)	115	160
			11	12	13	14	15
110	Fred Lane	10	143	152	(121)	(180)	136
170	Sue Bills	23					
160	John Johnson	21					
700	captain Fred Lane						

TOTAL POINTS WON 6

Figure 6

Guidelines for University Mixed II

League Comparisons

After developing the Baker scoring system into a league format and organizing the bowlers to bowl in this league, a procedure was developed which allowed the team standings of the Baker league to be compared to the standings of the traditional league system. In order to accomplish this, frame by frame scores were transferred from the Baker league telescore sheets to other score sheets using the traditional scoring method. These scores were transposed bowler by bowler and frame by frame in order to determine traditional scores and results. Because each bowler had bowled thirty frames each league session, a procedure was set up to score the eleventh and twelveth frames as was used with the Baker scoring system. This involved giving a bowler seven/spare after a tenth frame strike or a seven pin count after a tenth frame spare. This allowed the use of exactly the same scores bowled in the same sequence in comparing the Baker system to the traditional system.

As for looking at the team results of the traditional league competition, one point was given to the winning team of each game and one point was given to the team which had the highest total series. Four total points were at stake during each league session. Handicap was given to the team with the lower team average with that team receiving seventy percent of the difference between the total averages of the five bowlers of each team.

Individual averages were also kept on a week by week basis by transposing the Baker results into the traditional format. These individual averages were compared to the Baker system averages at the end of the seven weeks of bowling.

Post League Survey

In order to assess the feelings of the bowlers involved in the Baker league, questions were asked of thirty bowlers after the final week of bowling. These questions served as a guage by which to determine the participants thoughts regarding the use of the Baker scoring system in a league situation. A copy of this survey can be found in Figure 7.

Tonight ends the first attempt to use the Baker Scoring System in a league situation. Please complete the following questions so that we can get your reactions to this new league format.

1. What is your bowling average?_____

2. For how many years have you bowled?_____

3. For how many years have you bowled in league situations?_____

4. What is your competitive nature?

     _____highly competitive
     _____moderate
     _____non-competitive

5. What are your feelings toward using the Baker Scoring System?

     _____very favorable
     _____favorable
     _____neutral
     _____unfavorable
     _____very unfavorable

6. How do you feel about the Baker type league compared to traditional leagues?

     _____Baker System stresses competition
     _____Baker System is less competitive
     _____Both are equal in competitiveness

7. Would you bowl in a Baker type league again?

     _____Yes
     _____No
     _____Not Sure

8. Would you recommend a Baker type league to your friends?

     _____Yes
     _____No

9. Do you feel that a Baker type league is an alternative to traditional league bowling?

     _____Yes
     _____No
     _____Not Sure

10. What did you like most about the Baker type league?

11. What did you like least about the Baker type league?

12. Please list any additional comments or suggestions.

Figure 7

University Mixed II Post League Survey

Chapter 3

RESULTS

The results of this study can be determined by looking at the
week by week league standing comparisons and the final individual
average comparisons of the Baker system and the traditional system,
and the responses to the league survey.

League Standings

One of the objectives stated in Chapter One called for the
Baker system to result in closer team standings. In order to deter-
mine the difference between the Baker system team standings and the
traditional team standings, a week by week comparison of the percent
of wins in each system was completed. This percent of wins tabulation
is listed on a week by week cumulative basis in Table 1.

Table 1

League Standing Comparisons

Traditional System	Baker System
Week 1	
Team b 75%	Team b 60%
g 75	g 60
c 75	c 60
f 50	f 53
e 50	e 46
h 25	h 40
a 25	a 40
d 25	d 40
Range = 50	Range = 20
Week 2	
Team g 87%	Team g 60%
c 75	c 60
e 75	b 60
b 50	h 56
d 50	f 46
a 25	a 40
f 25	d 40
h 12	e 36
Range = 75	Range = 24
Week 3	
Team c 83%	Team c 62%
e 83	b 57
g 58	h 57
f 50	f 55
a 50	g 51
b 33	a 40
d 33	e 40
h 8	d 35
Range = 75	Range = 27

Table 1 (continued)

25

Traditional System	Baker System
Week 4	
Team c 87%	Team c 61%
e 62	f 57
g 62	g 54
f 56	b 52
d 43	h 51
a 43	d 43
b 31	e 40
h 12	a 39
Range = 75	Range = 22
Week 5	
Team c 75%	Team c 58%
e 65	f 56
g 55	g 52
f 50	h 52
a 50	b 51
d 40	d 44
b 40	e 42
h 25	a 42
Range = 50	Range = 16
Week 6	
Team c 79%	Team c 58%
e 66	h 53
f 54	f 53
g 50	g 49
a 45	b 49
d 45	e 46
b 33	d 46
h 25	a 41
Range = 54	Range = 17
Week 7	
Team c 67%	Team f 58%
e 64	c 51
f 60	b 51
d 50	d 50
g 46	h 50
a 46	e 46
b 39	g 45
h 25	a 43
Range = 42	Range = 15

As can be seen in Table 1, the Baker system allowed for closer standings each week. The variance of traditional league ranges extended from a high of seventy-five to a low of forty-two, while the Baker system showed ranges from a high of twenty-seven to a low of fifteen. The average range of the traditional system was 60.14 while the average range of the Baker system was 20.14. These figures clearly indicate that the Baker system allowed for closer overall team standings on a week by week basis than did the traditional system.

Final Individual Averages

Final individual averages were studied by comparing the marks per game average under the Baker scoring system with the averages derived from the traditional scoring system.

The numbers listed in the columns of Table 2 are as follows:

Baker Average - The average derived for each bowler by using the marks per game average method.

Traditional Average - The average which the bowler would have had in a traditional league.

Total Marks - The total number of marks (strikes and spares) the bowler recorded during the seven week period.

Total Games - The total number of games bowled by each individual during the league.

Mark Average - The quotient of the number of marks divided by the total number of games. This number was used to determine the Baker average.

Percent Off - This percentage was calculated by first determining the number of marks per game needed to fall within the traditional

scoring scale. The required marks per game were calculated by multiplying the marks per game needed to fall within the proper marks per game range by the total number of games bowled. Next, this product was subtracted from the actual total number of marks. Finally, the remainder was divided by the actual total marks. This yielded the percent of change needed in order for a person's Baker average to fall within the proper traditional average range. An example of this calculation follows:

Baker Average	Traditional Average	Total Marks	Total Games	Mark Average	Percent Off
80	96	5	3	1.66	+50%

Using the above figures, the +50% figure was arrived at by means of the following calculations:

2.50	(marks per game needed for the Baker average to fall within the traditional scoring scale for a 96-105 average)
x 3	(total number of games bowled)
7.50	(total marks needed for the Baker average to fall within the traditional scale)

5.00	(total actual number of marks)
-7.50	(from above calculation)
2.50	(remainder)

$$\frac{\text{(remainder)}}{\text{(total actual marks)}} \quad \frac{2.50}{5.00} = 50\% \quad \text{(percent of change needed, in this case additional marks are needed)}$$

Following are the figures which were attained by recording individual averages using both the Baker system and the traditional system.

Table 2

Individual Average Comparisons

Baker Average	Traditional Average	Total Marks	Total Games	Mark Average	Percent Off
80	96	5	3	1.66	+50%
90	92	49	21	2.33	
	99	19	9	2.20	-18
100	101	8	3	2.66	
	101	25	9	2.77	
110	110	60	18	3.42	
	114	74	21	3.52	
120	113	54	15	3.60	+ 1
	113	92	21	4.38	+18
	114	81	21	3.85	+ 7
	115	24	6	4.00	+10
	116	78	21	3.71	
	118	82	21	3.90	
	120	11	3	3.20	
	120	75	18	4.16	
	121	86	21	4.09	
	122	74	18	4.11	
	123	62	15	4.13	
	123	83	21	3.95	
	125	66	15	4.40	
	125	93	21	4.42	
	126	54	12	4.50	- 1
	129	79	18	4.38	- 4
130	125	15	3	5.00	+ 9
	127	15	3	5.00	
	129	14	3	4.66	
	129	74	15	4.93	
	132	68	14	4.85	
	132	105	21	5.00	
	133	108	21	5.14	
	136	16	3	5.33	- 1
	144	99	18.6	5.32	- 1
140	136	33	6	5.50	
	137	90	17	5.35	
	138	81	15	5.40	
	141	102	18	5.66	
	143	93	17	5.47	
	155	17	3	5.66	

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Table 2 (continued)

Baker Average	Traditional Average	Total Marks	Total Games	Mark Average	Percent Off
150	146	73	12	6.08	
	148	125	21	5.95	
160	147	78	12	6.50	+ 2
	149	97	15	6.46	+ 3
	152	38	5.8	6.55	+ 3
	154	20	3	6.66	+ 5
	158	56	8.6	6.51	
	158	114	17	6.70	
	158	146	21	6.95	
	159	144	21	6.85	
	164	126	18	7.00	
	165	129	18	7.16	
	166	63	9	7.00	− 4
	167	148	21	7.04	− 3
	177	57	8	7.12	− 8
170	156	22	3	7.33	− 1
180	188	152	18	8.44	+ 1

Fifty-five individuals (trials) bowled during the seven week league. Of these fifty-five trials, thirty-five (63.63%) of the Baker averages fell within the traditional average ranges. Of the twenty final Baker averages not within the traditional average ranges, eleven trials needed to increase in total marks in order to fall within the proper marks per game range. The other nine trials needed to decrease in marks in order to fall within the proper marks per game range.

The figures in Table 3 show the number of trials in which the marks per game average did not fall within the traditional average ranges. The percent of error is listed in groups of 0-5%, 6-10%, 11-20%, and 21% and above. The fourth column indicates the percent of cumulative trials correct when the trials which fell within each percentage group were added to the thirty-five trials that were correct.

Table 3

Individual Average Error Factors

Percent Off	Number of Trials	Cumulative Trials Correct	Percent of Cumulative Trials Correct
0-5%	13	48	87%
6-10%	4	52	95%
11-20%	2	54	98%
21+%	1	55	100%

By reviewing the individual average comparisons, it can be seen that the Baker marks per game average fell within or near the limits established. Therefore, it can be concluded that the system of counting strikes and spares can be recognized as a workable system for determining individual bowling averages for the Baker league.

Post League Survey

The survey which was administered to thirty bowlers at the conclusion of the final week of bowling showed that the backgrounds of the individuals participating in the experimental league varied greatly. The ages of the bowlers ranged from eighteen to fifty-two while bowling league experience varied from thirty years to no prior league experience. Bowling averages varied from a high of 188 to a low of 88. Table 4 shows the results of the post league survey.

Table 4

University Mixed II - In Review

What is your competitive nature?

        5   highly competitive
       22   moderate
        3   non-competitive

What are your feelings toward using the Baker Scoring System?

        1   very favorable
        9   favorable
       11   neutral
        9   unfavorable
        0   very unfavorable

How do you feel about the Baker type league compared to traditional leagues?

        3   Baker system stresses competition
       24   Baker system is less competitive
        3   Both are equal in competitiveness

Would you bowl in a Baker type league again?

       13   Yes
        9   No
        8   Not sure

Would you recommend a Baker type league to your friends?

       18   Yes
       10   No
        2   Not sure

Do you feel that a Baker type league is an alternative to traditional league bowling?

       14   Yes
        5   No
       11   Not sure

What did you like most about the Baker league? (The following is a list of responses.)

        team work
        fun the team had
        team effort
        see how high of a score the team could bowl
        the new format

Table 4 (continued)

it's more interesting
seems to finish earlier
relaxed atmosphere
individual is deemphasized
fast moving
good mixer
hides bad scores
meet more people
one point per game
change of pace from traditional league
starting new game every 10-15 minutes
more even team scores
casual attitude of all
less competitive
no person singled out
no pressure on individual
no team ran away with the league
team unification
nice change of pace
less tension
no one was as serious

What did you like least about the Baker league? (The following is a list of the responses.)

no individual scores
very time consuming
was hard to concentrate
seemed long
never knew exact average
not knowing own score after each game
not good for a super competitive person
no test on how well I'm bowling
don't like the way game is bowled
use of vacancy scores
don't know how well you are doing
inaccurage on individual averages
never sure of exact score
scoring of eleventh and twelveth frames
lost train of concentration
not much intensity
five people a lot to have on a team
needed more incentive

Chapter 4

CONCLUSIONS

This chapter includes a summary of the purpose of this study, conclusions which were reached, recommendations for further research, and a brief review of the study.

Summary

The purpose of this study was to develop a workable league format using the Baker scoring system so that league standings and individual averages could be compared to these traditional league statistics.

The Baker league was developed in order to provide an added dimension to league bowling. Practicality and usefulness were considered in each segment of the development of this format. The experienced as well as the beginning bowler was considered during the league's development. An attempt was made to formulate a new and different league format while retaining many of the basic characteristics of traditional leagues. Such characteristics included using a five member team and keeping the rotation of those bowlers the same as in traditional leagues. Also, the total number of frames bowled by each person was the same as in the traditional format with the exception of the eleventh and twelveth frame bonus balls. Regular telescore sheets were used so that the physical set up of a bowling center could be utilized without any modifications.

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Because of the emphasis on team bowling, nearly all individual recognition was eliminated. It was felt that the highly competitive person would not favor the Baker format because of this deemphasis on individual recognition. On the other hand, the person who bowls for fun and relaxation rather than competition and personal reward would find the Baker league complimentary to his wants and needs.

Conclusions

The league ran smoothly throughout the seven week period. The format developed for this study worked and the participants developed an understanding of the league. As was seen in Chapter Three, the standings of the Baker league were much closer on a week by week basis than were the standings using the traditional league format. Also, the final comparison of individual averages of each system revealed that the Baker marks per game average fell within traditional average ranges ninty-five percent of the time when a ten percent error factor was considered. This average system provided a usable format to determine individual averages for the purpose of conducting the Baker league.

In reviewing the responses of the league participants, it became obvious that there was a varied reaction to the Baker league. This variety indicates that while the Baker scoring system did not satisfy all bowlers, it was a workable and enjoyable league format for a number of them. Thus, there seems to be marketable audience for the Baker system in some amount of league play.

As can be seen by the various responses to the open ended questions in Table 4, feelings varied among participants. The idea of a team effort, the deemphasis of the individual, and the relaxed

atmosphere which resulted were the remarks made most often by participants
when asked what they liked most about the Baker league. These responses
would allow for the word competition to once again take on the meaning
of "to seek together."

The remark mentioned most often concerning negative aspects
of the league was that an exact individual average was never known. This
must be considered as the primary shortcoming of the Baker league.
Follow-up studies can be done which would further legitimize the marks
per game average of the Baker system. A procedure could be established
to record individual scores on a frame by frame basis so that an actual
average could be determined. However, it would seem that this type of
calculation would involve more computations than the average bowler
would care to make. As a result of these calculations, league bowling
could become more of a chore than a time of fun and relaxation.

Recommendations

As this was the first attempt to utilize the Baker scoring
system in a handicap league format, the need for additional research is
imperative. More people must be exposed to this new league format in
order to assess the feelings of a wider range of people. Also, the
comparison of league standings and individual averages between the Baker
system and the traditional system must be repeated in order to test the
reliability and validity of this study. In addition, modifications of
this study could be made to determine changes in participant reactions
as variations are incorporated. Such changes as bowling a two or three
round robin league, changing the percent of handicap used, or actually
bowling the bonus balls in the eleventh and twelveth frames could be
incorporated. In any event, further utilization of the Baker scoring

system in league bowling must be made in order to determine its receptiveness.

In Review

By using the Baker scoring system in a league situation, a workable league format was developed. The evenness of team standings, in comparison to the traditional league format, throughout the seven week league was certainly a positive attribute of the Baker league. Also, the marks per game average provided a usable individual average determinant. The feedback received from the participants of the league was encouraging. The Baker league may well be an acceptable alternative for some of the 9.5 million league bowlers. A Baker-type league would be best suited for the recreational bowler rather than the competitive bowler. This may be the time to take the Baker scoring system out of storage so that this unique system can be put to use in a league format. The Baker system may provide league bowling with what it has long needed in an alternative form of competition.

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THE BAKER SYSTEM: AN ALTERNATIVE
FOR LEAGUE BOWLING

by

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B. S., University of Wisconsin - LaCrosse, 1972

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AN ABSTRACT OF A MASTER'S THESIS

submitted in partial fulfillment of the

requirements for the degree

MASTER OF SCIENCE

Department of Health, Physical Education and Recreation

KANSAS STATE UNIVERSITY
Manhattan, Kansas

1977

ABSTRACT

The purpose of this study was to develop a workable league for-
mat using the Baker scoring system so that league standings and individual
averages could be compared to traditional league statistics. The league
was developed using the Baker scoring system in order to provide an
alternative dimension to league bowling.

The Baker scoring system involved the lead-off person bowling
frames one and six, the second person bowling frames two and seven, and
so forth. Five people comprised a team with each person bowling two
frames in each of the fifteen team games per week. Fifteen points were
possible during each team match. A single round robin format was used
for the eight team league. A system was established in order to deter-
mine individual averages. Strikes and spares were each counted as one
mark in order to determine a marks per game average. This marks per
game average related to traditional averages.

The team standings of the Baker league were much closer on a week
by week basis than were the standings using the traditional league format.
The average range of the Baker league standings was 20.14% while the
average range of the traditional league was 60.14%. When a ten percent
error factor was considered, the Baker averages fell within traditional
average ranges ninty-five percent of the time.

A workable league format was developed using the Baker scoring
system. The Baker league allowed for more even team standings and the
marks per game average provided a usable average determinant. The Baker
league may well be a salable alternative for some of the 9.5 million
league bowlers. This league would be suited for recreational bowlers.