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## **Abstract**

During the 2009 and 2010 seasons the Rochester Rhinos soccer club has experienced a downturn in match attendance. The team has been in their new, soccer specific stadium, for the last five seasons. After two seasons of promising attendance, the last three seasons have been about the lowest in the team's 15-year history. Is the "honeymoon" over already? What drives attendance to Rhinos matches? This study looked at 10 variables that have an effect on attendance. Using attendance data from the 2000 and 2010 seasons, this study ran correlation and regression analysis. After analysis it was found that there was significance in the start time, location, and opposing team at Rochester Rhinos home soccer matches. It was suggested that more research be done and an expansion of attendance data be analyzed to draw further conclusions.

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A Study of Variables that Effect Attendance at  
Rochester Rhinos Home Soccer Matches

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St. John Fisher College

### Abstract

During the 2009 and 2010 seasons the Rochester Rhinos soccer club has experienced a downturn in match attendance. The team has been in their new, soccer specific stadium, for the last five seasons. After two seasons of promising attendance, the last three seasons have been about the lowest in the team's 15-year history. Is the "honeymoon" over already? What drives attendance to Rhinos matches? This study looked at 10 variables that have an effect on attendance. Using attendance data from the 2000 and 2010 seasons, this study ran correlation and regression analysis. After analysis it was found that there was significance in the start time, location, and opposing team at Rochester Rhinos home soccer matches. It was suggested that more research be done and an expansion of attendance data be analyzed to draw further conclusions.

### A Study of Variables at Rochester Rhinos Home Soccer Matches

The city of Rochester, New York was once regarded as “Soccertown, USA” for the drawing of such large crowds in the late 1990’s by the Rochester Rhinos (DiVeronica, 2006). Unfortunately, the Rhinos have fallen on tougher times and the days of large crowds are only a thought of the past. What has caused this drop in attendance? This paper has attempted to discover why attendance numbers at Rochester Rhinos home matches has declined over the past few years.

Different variables have taken into effect when looking into the attendance figures. These factors include: season, day of the week the match is played, time of the match, temperature at match time, weather conditions, location (stadium), record (win/loss), if there was a promotion, and the ticket price that season. This paper tried figure out which variable effects attendance enough to try to improve attendance figures. It also gave suggestions for improvement or future research on the topic.

The Rhinos franchise was formed in 1996, however soccer in Rochester dates back to the Rochester Lancers who played from 1967 – 1980 in the North American Soccer League (DiVeronica, 2010). With the birth of the Rhinos, came the rebirth of soccer in Rochester. The team has had nothing but success in the 15-year history of the organization. In each season the team has made the playoffs and has won three league championships, 1998, 2000, and 2001 (DiVeronica, Nov. 2009). They are also the only A-League franchise, one step below Major League Soccer (MLS), to win the Lamar Hunt U.S. Open Cup, which they accomplished in 1999. The Open Cup is a national tournament between minor league soccer teams throughout all

divisions and teams in the MLS (DiVeronica, July 2009). One would think that with all of this success attendance number would hardly be hurting, but this is quite the opposite. To gain a better understanding of this situation, I looked at previous studies that dealt with attendance variables and attendance issues.

### **Literature Review**

Attendance and the variables that affect it have been widely discussed across all levels of sport; professional to non-professional or major/minor league to collegiate. The topic of fan motivation and what draws people to sporting events is a much talked about topic in all aspects of sport. The following studies that can relate to the Rhinos attendance issues will help to gain a better understanding of the factors that can cause a shift in attendance.

#### **Professional**

To gain a better understanding of attendance at Rochester Rhinos matches, previous research needed to be analyzed about the different factors that could influence attendance. For the purpose of this study, the term professional includes Major League and Minor League organizations. European studies were also analyzed with organizations at their professional level to gain a better understanding of not only American run organizations, but also foreign.

#### **Facility location and quality**

In the literature on facilities, most talk about the “honeymoon effect” or the “novelty effect.” The “honeymoon effect” is the implication that with a new facility comes increased attendance, but as time passes the newness wears off and attendance begins to decrease (McEvoy, et al., 2005). The “novelty effect” is the assumption that stadiums and arenas are

destinations all by themselves and lead to increased attendance regardless of team performance (Howard & Cromton, 2003). A study done by Howard & Cromton (2003) looked to see if attendance grew by moving to a new stadium. They found that there seems to be a slight increase in attendance during the first few years, however attendance then starts to slip. They suggested that the later drop was due to the constant increase in ticket prices (Howard & Cromton, 2003). Other studies looked at the “honeymoon effect” which holds the same concept. A 2005 study by Chad McEvoy and colleagues looked at attendance throughout the lifespan of a facility and compared that to a new facility. They found that during the first few years there was an increase in attendance, but then there was a drop in subsequent years. In the 48<sup>th</sup> year attendance reached its lowest point, but attendance slightly rose in the final years of the facility (McEvoy, et al., 2005). A second “honeymoon” study looked at all Major League Baseball stadiums from 1970-2000 and their attendance numbers. The authors found that there is a “honeymoon effect” between attendance and ticket price in a new venue. As ticket prices slowly grow over the first 8 to 10 years after a new stadium is built, attendance shrinks. Lastly, the authors also noted that a new stadium to replace an older one would generate an additional \$228 million in ticket revenue over 15 years (Zygmunt & Leadley, 2005). Additional revenue would be attractive to any ownership group. This is why most teams build new venues in an attempt to expand and make more money.

When taking into effect facility, not only does physical location need to be thought about, but also the quality that is provided to the fan. A study of 460 fans that attended major

sporting events in Australia were surveyed and it was found that if the facilities are not adequate or to the liking of the fan than the attendance will be lower (Hall, et al., 2010).

The only study found that dealt with the minor leagues and novelty effect was done by Donald Roy in 2003. The author looked at attendance data from 101 stadiums opened between 1993-2004. Results showed that attendance increased only slightly in years 2-5, with an average in year 5 only .2% higher than that in year 1. Attendance levels in replacement stadiums, those built in place of existing stadiums, were 74% higher in year five than the final year of the old stadium. The greatest increases were in Class A leagues and Independent leagues (Roy, 2008).

### **Effect of Promotions**

Boyd & Krehbiel have done three separate studies dealing with the type of promotion that was run, and two studies on the timing of promotions. In the first study by Boyd & Krehbiel was done in 1999 on the timing of promotions. This study also looked at MLB and promotions that were run on different days of the week and which has the better influence on attendance. They found that it is better to run promotions on day games and weekend games rather than games against rivals (Boyd & Krehbiel, 1999). In a 2003 study Boyd & Krehbiel also looked at MLB to study the attractiveness of promotions and how they relate to fan attendance. They used three different promotions that were placed at three different times and against three different opponents on different days of the week. At the end of the study the authors found that combining a giveaway promotion with other game attractive items, like opposing team, decrease the value and attendance (Boyd & Krehbiel, 2003). This study point



out that it is better to spread out promotion nights and not to combine them with other factors that may increase attendance, such as the other team. The last study looked at which type of promotion to run on a given night, they looked at every game played during the 2002 Major League Baseball (MLB) season. Using multiple regression analysis Boyd & Krehbel found that it is the most beneficial to run a giveaway promotion and ticket event or special event, or two special events. Also, night games are found to have the greatest attendance (Boyd & Krehbiel, 2006). The last study that I found using major leagues looked at the marginal impact on attendance with additional promotional days. The authors found that a promotion increases attendance by about 14%. However, the increase of promotions has a negative impact on the marginal impact of each promotion, but the gain in attendance outweighs the watered down effect by having the additional promotions (McDonald & Rascher, 2000).

The effect of promotions was also found in studies of minor league organizations. The first study looked specifically at the Carolina League, which is an advanced A-League or near the bottom levels of MLB, and the effect promotions had on attendance. They authors found that a promotion, such as food, drink, ticket or a giveaway, draw the most attendance on weekends, such as Friday and Saturday compared to weekday games (Cebula, et al., 2009). The other study looked at the Savannah Sand Gnats, also a lower level A-League team and the changes they made, including promotions, to their marketing plan to increase attendance. The team added event nights and fireworks as well as on-field and in-stadium promotions. The study pointed out that these changes have been very effective in increasing attendance (Lachowetz, et al., 2009).

### **Other Factors**

Another area considered to effect fan attendance is winning percentage of the organization. The assumption is that teams that are performing better will achieve higher attendance. A study of MLB teams in 2008 looked at this variable and found this idea to be true. In the study ... (Davis, 2008).

While many studies explore promotions or location, very few have touched on the relationship between ticket prices and attendance. It is thought that this would have a bigger impact on attendance and more research done on the topic. However, only one study was found of primarily MLB teams, but did include NBA and NFL teams. The study found that ticket prices are fairly inelastic; meaning that no matter what the price charged fans will still attend games and allows teams to pursue the maximum amount of revenue. The study did find however, that things like concessions and parking are elastic; which means that a change in price will cause a change in the number of fans that purchase (Coates & Murphy, 2007).

While many of the above studies only examined a single level of sport, research by Bernthal & Graham (2003), compared fan motivations within a single sport, baseball. The study surveyed fans at two minor league baseball and two collegiate baseball games on consecutive nights to find out the motivation behind attendance at the games. The authors found that fans to collegiate baseball games attended the game for the game itself, whereas the fans at minor league game were more apt to go for a promotion, giveaway or added entertainment that the game offers (Bernthal & Graham, 2003).

### **Non-Professional**

Non-professional sport is just as significant as professional sport in the fact that they draw attendance and make money for, in most cases schools to help fund the sport programs. Some of the same factors that effect professional sport also effect non-professional and in this case collegiate sport. Two main factors that were touched on by research were the winning percentage, or how well the collegiate team played as it related to attendance and the price of tickets to games and the availability of those tickets.

Like in professional sports the facility location and the quality of the facility play a factor in fan attendance. A study conducted in 2005 looked specifically at the geography aspect and looked to predict visitor attendance at college football games. The study looked at teams in the Mid-American Conference (MAC) between 2001 and 2002. The study found that there was a strong correlation between visitor attendance, distance traveled by the visitor, and team winning percentage (Leonard, 2005).

Two other studies found that there is also a correlation between winning percentage and fan attendance, along with the study previously mentioned in the facility section, which primarily dealt with facility location, Jensen & Deschraver (2002) specifically looked to see what factors led to fan attendance at college football games in NCAA Division II. Not only did they find that home team's winning percentage mattered, but also the winning percentage of the opposing team. The other study in this area also looked at the determinants of attendance at NCAA Division II football games. The author of this study found that not only current winning percentage but also previous years winning percentage played a role. Other determinants

though included homecoming promotions and the existence of a booster club, which if one was present had a negative correlation to attendance (Wells, et al., 2000).

The final study of relevance related to ticketing and attendance. This was a survey of 108 college students about attendance at collegiate sporting events. Specifically the authors looked to find the impact of scarcity of tickets and attendance. The authors found that there was not a large impact between the scarcity of tickets and attendance of events (Wann, 2004).

What do these previous studies have to do with the Rochester Rhinos? They show that there are factors that effect attendance at sporting events and there are solutions that can fix a decrease in attendance. Through the use of data collected from the Rochester Rhinos this study sought out to find what variables effect attendance at Rochester Rhinos home soccer matches.

### **Method**

This study was of longitudinal design. It compared ten variables between the 2000 and 2010 seasons to find out which had the greatest influence on fan attendance at Rochester Rhinos home matches. The data was provided by the Rhinos organization and was compared using independent correlation and multiple regression analysis (Gratton & Jones, 2010). These different analyses were used to try to find a relationship with the variables and attendance. The analysis was used to find out if a specific variable was a more dominant than another. By using an independent correlation and multiple regression analysis of the variables tried to find out if it was a specific variable by itself that had an effect or if it was multiple variables acting on attendance.

### Description of Variables

The study had two types of variables, dependant and independent variables. The dependant variable in the study was attendance. The variable was calculated not only on a game-by-game basis but also on a season basis. This measured the number of fans that attend home matched for the Rochester Rhinos.

Independent variables.

1. Season – the Rhinos have been around for 15 seasons, for the purpose of this study the 2000 and 2010 seasons were looked at to look at the honeymoon effect. Both season were five years into each stadium, Frontier Field and Marina Auto Stadium.
2. Opposing team – this variable looked at the individual opponents that the Rhinos faced and if specific opponents drew more fans.
3. Time of game – this variable looked to see if the start time of the match was a factor in match attendance.
4. Temperature – the temperature variable looked at the temperature at match time and if this plays an effect on attendance.
5. Weather conditions – along with temperature the weather conditions at match time also could play a factor in attendance. Weather conditions include clouds, sun, and rain.
6. Location – this variable looked at the two different locations that the Rhinos have played in: Frontier Field and Marina Auto Stadium. This variable will look to see if location is a factor of attendance.

7. Record – this variable looked at the win-loss record of the team going into a match.  
Using the record as a percentage can show if the Rhinos record had any influence on attendance.
8. Promotion – this variable looked to see if there were any giveaways being run for games throughout the season.
9. Type of giveaway – this variable looks at each specific giveaway on each night that they ran a promotion.
10. Theme night – This variable looked to see what if any theme nights were run and if they had an impact on attendance.

The table below describes each variable and how the variables will be coded so that they are properly analyzed.

The above variables value was entered based on each proper code for the variable into the SPSS statistical software for analyzing. The results from the analysis are conveyed below.

### Results

The results of the independent correlation analysis found that the two most significant variables that effect Rochester Rhinos attendance are opposing team and the location of the match. Both variables had a significance of .000. The next closest significant figure was the theme night variable, which had a significance of .102. The team's record was the next closest

<b>Main Effect</b>	<b><i>r</i></b>	<b>Sig.</b>
Attendance xRecord	.196	.259
Attendance x Location	-.593	.000**
Attendance xOpposing Team	-.829	.000**
Attendance xStart Time	-.036	.836
Attendance xTemperature	.004	.980
Attendance x Weather Conditions	-.091	.604
Attendance xPromotion	-.281	.864
Attendance x Giveaway	.030	.220
Attendance x Theme Night	.213	.102
Attendance x Regular v Post Season	.000	1.0

significant factor with a significance of .259. The other factors had a significance over .600 and regular versus post-season which had a significance of 1.0.

The multiple regression analysis provided a mixture of data. The same significant factor of opposing team also had a significance of .000 in this analysis. The surprising variable that had significance was the start time variable. Start time had a significance of .017. Since the start time of the matches being very similar this is a surprising output from the data analysis.

The temperature variable was very close in being significant with a significance of .074.

However, this was the only other variable that came close in pulling significance. The other variables were all over .250 and went as high as .834.

Variable	Standardized Coefficients	t	Sig.
Constant		5.298	.000
Record	.056	.537	.596
Location	.111	.772	.448
Opposing Team	-1.033	-.7304	.000**
Start Time	.248	2.556	.017*
Temperature	.168	1.865	.074
Weather Conditions	-.019	-.212	.834
Promotion	-.099	-.595	.557
Giveaway	-.045	-.467	.645
Theme Night	.161	1.117	.275
Regular v Post Season	-.104	-.968	.343

### Discussion

Based on the data in the analysis it was found that the main variables that effect attendance at Rochester Rhinos home matches are location, start time, and opposing team. These results come as a surprise as one would think that promotion, theme night, or weather would be thought of as a main variable that would effect attendance. With the significance found in location, start time, and opposing team the only real factor that can be changed, realistically is the start time of the match. The variable of location could be changed, but as



stated earlier in this paper (need to add), the team recently moved to Sahlen Stadium and spent a considerable amount of money doing so. This would seem that the option to move the team again would be out of the question. The last variable of the opposing team is another variable that cannot be changed as the league decides who they will play each season. The Rhinos could however change leagues to be in a league with specific teams, however this too is rather unlikely. The only feasible change that the Rhinos could make is a change in the start time of the match. Based on the data analyzed it seems the best start time of the match is at 6 O'clock. However, the team could identify the best start time by surveying their fans to find out what they believe to be the best start time and adjust accordingly.

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