

THE PENNSYLVANIA STATE UNIVERSITY
SCHREYER HONORS COLLEGE

DEPARTMENT OF MARKETING

UNCOVERING THE DRIVERS OF SPORTS FAN AVIDITY

KATELYN CHEYNE
Spring 2010

A thesis
submitted in partial fulfillment
of the requirements
for a baccalaureate degree
in Marketing
with honors in Marketing

Reviewed and approved* by the following:

Wayne S. DeSarbo
Smeal Chair Distinguished Professor of Marketing
Thesis Supervisor

Jennifer Chang Coupland
Clinical Associate Professor of Marketing
Honors Adviser

* Signatures are on file in the Schreyer Honors College.

ABSTRACT

Fan Avidity is an essential topic in the sports industry - a \$400 billion industry that is one of the fastest growing sectors in the United States. It has been defined as the level of interest, involvement, intensity, passion, and loyalty a fan gives to a particular sport, league, team and/or player (DeSarbo, 2009). Research has shown that avid fans are important to the business of sports because among other things they generate more revenue than non avid fans, and are more likely to recognize and buy from league sponsors. Recent research has shown that the single item scales that are currently used by market research companies to measure fan avidity are insufficient in describing the differences in the manifestations or expressions of fan avidity. As such, DeSarbo (2009, 2010) has recommended the direct measurement of the various behavioral manifestations of fan avidity. The objective of this research is to derive market segments that exhibit different pathways to fan avidity, and describe the significant drivers of fan avidity. Students from Penn State University are the focus of this study. A regression analysis will be used to examine the activities that could be significant drivers of fan avidity. Principal Components Analysis will reduce the number of variables studied to get a clearer picture of the latent aspects of the behavioral activities of avid fans. The Constrained Latent Class Regression method will generate market segments and describe the fans that belong to each segment. Drivers of fan avidity will simultaneously be identified and discussed. A discussion of the results will follow, as well as marketing managerial implications. Several other directions for additional research will be recommended.

LIST OF TABLES AND FIGURES

Tables

1. Football Activity Descriptions.....	22
2. List of Steps in Analysis	23
3. Table of Correlations.....	24
4. Aggregate Regression Analysis.....	25
5. Aggregate Regression Analysis Coefficients.....	26
6. Aggregate Regression Analysis – Stepwise Method.....	27
7. Stepwise Method Coefficients.....	28
8. Stepwise Method Coefficients (Cont.)	29
9. Results for the Extraction of Component Factors.....	30
10. VARIMAX Rotated Component Analysis Factor Matrices.....	31
11. List of Factors Derived from Principal Components Analysis.....	32
12. Aggregate Regression Analysis with 11 Factors.....	33
13. Latent Structure Regression Results (Goodness of Fit).....	34
14. $K^*=2$ Solution Parameters.....	35
15. Segment Means Compared for $K^*=2$ Solution.....	36
16. Segment Means Compared for $K^*=2$ Solution (Cont.)	37

Figures

1. Frequencies of 35 Activities.....	38
--------------------------------------	----

TABLE OF CONTENTS

Abstract.....	i
List of Tables and Figures.....	ii
Chapter 1: Introduction.....	1
Objectives of Research.....	2
Chapter 2: Literature Review.....	3
Chapter 3: Study.....	6
Chapter 4: Analysis.....	7
Principal Components Analysis.....	10
Latent Class Regression.....	12
T-Test Analysis.....	15
Chapter 5: Discussion of Results.....	17
Managerial Implications.....	19
References.....	39
Appendix A.....	42

Chapter 1:

Introduction

The sports industry is one of the ten largest and fastest growing business sectors in the United States, with estimates of the market being around \$410 billion (Plunkett Research, 2009). A large part of this growing industry is attributed to the fans - the consumers of sport. A growing area of conversation in the sports industry is on the topic of fan avidity. Dr. Wayne DeSarbo from Penn State University has defined fan avidity as “the level of interest, involvement, passion, and loyalty a fan exhibits to a particular sports entity (i.e. a sport, league, team, and/or athlete)” (DeSarbo, 2009). A 2007 Turnkey Sports Poll revealed that these avid sports fans have been found to spend considerably more money and time for sports related activities and goods than their non avid fan counterparts. A recent Sports Business Journal article also pointed to the importance of avid fans by showing they were more likely to recognize and buy from league sponsors than their non avid counterparts (Broughton, 2010). Sports fans represent big business opportunities for sports teams and leagues. League and team licensed merchandise have sold \$12.6 billion in the United States (Rein, 2006). Despite the growing importance placed on fan avidity, there has been little done in the academic research to explore and analyze this topic. Understanding and being able to segment sports fans in terms of their avidity would aid those in the sports industry in identifying the fans that are the most important for their business.

Objectives of Research

Sports market research firms currently use the term “fan avidity” in surveying customers when asking how interested they are in a particular sport. The “very interested” fans are then labeled avid (Scarborough Sports Marketing, 2008). These single item response scales are the only measure that companies are using to discriminate avid fans from others. This measure does not differentiate different types and manifestations of fan avidity, and may be too broad for marketing purposes. Dr. DeSarbo (2010) conducted a study to research this topic and used spatial choice models to uncover latent dimensionality of various expressions of fan avidity. He determined that these single item measures that sports marketing companies use were insufficient to show how complex and heterogeneous these avid fans were. Dr. DeSarbo uncovered four dimensions of the manifestations of fan avidity labeling them: on-field participation, passive following, social, and purchasing (DeSarbo, 2009, 2010). He determined that there are different revenue implications with each segment, which is very important to marketers within the sports industry. This research will use the data from Dr. DeSarbo’s study at Penn State University with the objective of now deriving market segments that exhibit different pathways to avidity, and to explore the drivers of fan avidity.

Chapter 2

Literature Review

While fan avidity is a growing topic in the sports industry, there has not been much academic research surrounding or defining the term. As previously stated, Dr. DeSarbo defined it as “the level of interest, involvement, passion, and loyalty a fan gives to a particular sport, league, team and /or player” (DeSarbo, 2009, 2010). While the specific topic of fan avidity has not been extensively researched, it has been used a measure in sports marketing research and sports polls. One source defined fan avidity as “how consumed each fan is with a particular sport” (Lynde, 2007). Leagues such as the NHL have realized that tracking the passion of sports fans is important to their business. The NHL has created a system that monitors and analyzes fan information online to generate an “avidity score” (Levey, 2006). The importance of fan avidity is of growing importance to sports marketers, as they begin to understand that such fans have financial implications for teams. These avid fans that are emotionally attached to their teams “will likely make many purchases as a result of their team affiliations” (Capella, 2002). While the actual topic of “fan avidity” has not been extensively researched, many other topics relating to sports fans have been discussed at length. The following will discuss research surrounding motives, characteristics, and classifications of sports fans, as well as academic research that discusses increasing fan loyalty or fan identity.

Many have attempted to study the behavior and nature of sports fans. Spectator sports are unique because no other brand or community “generates the type of passion that is characteristic of spectator sports” (Heere, 2007). Daniel L. Wann writes that the motives to becoming a sports fan can be broken into eight different categories: group

affiliation, family, aesthetic, self-esteem, economic, eustress, escape, and entertainment. One of the most widely studied motives is group affiliation, as research has shown that fans “consume sports as a member of a social group to satisfy social interaction needs” (Wann, 2001). Other theories suggest that sports fans consume sports not just to be a member of the group they are with, but to see themselves as a member of the actual sports team. Social Identity theory is the basis for this argument, suggesting that sports teams serve as an area for identification for individuals who define themselves by memberships of groups that they are a part of (Tajfel, 1978). Thus, fans do not see themselves as consumers of a sport, but rather a member of this group. Sports team identification is the extent that fans feel connected to a team (Wann, 2001).

Research has also been done to attempt to understand the characteristics that impact the behaviors of sports fans. In a study on the characteristics of fanaticism, it was found that four characteristics were common among all fans studied: “internal involvement, external involvement, a desire for interaction with others, and a wish to acquire source related material” (Thorne, 2006). Internal involvement related to internally identifying with sports teams, while external involvement related to participating in such activities as going on related websites or reading various materials about a subject. This research also showed that fans wish to acquire merchandise and memorabilia related to the source, and that interacting with others regarding the area of interest is important (Thorne, 2006) This study concluded that “marketing practitioners can use these characteristics as an aid in marketing goods and services targeted toward fans” (Thorne, 2006).

While previous research discussed fans as a whole, there has also been research

that has attempted to segment and classify sports fans. One study sought to “enable those researchers interested in sports marketing to better explain and predict fan behavior by accounting for variance in fan type” (Hunt, 1999). Five types of fans were subsequently identified and discussed: temporary, local, devoted, fanatical, and dysfunctional (Hunt, 1999). Marketing strategies were discussed for each of these five types of fans. Devoted fans were described as fans that “tide over teams through bad times” and remain supportive of the team by attending and watching games, even when the team is not winning or has changed locales (Hunt, 1999). Fanatical fans were described as being similar to devoted fans, but having an “emotional intensity” felt about the team. Marketers were recommended to create “insider” publications and offer a wide array of products that these fans could use to express their devotion (Hunt, 1999).

Strategies have also been reviewed on how to increase fan loyalty, viewership, or care about a particular entity. One journal article explained the importance for marketing managers to realize the significance of the community of a sports team to foster stronger team identification. It argues that sports teams serve as a source for group identity but also “provide a symbolic representation of other aspects of social or community life” (Heere, 2007). These aspects are referred to as external group identities. Teams thus are brand communities that people can identify with. By emphasizing traits such as rituals, traditions, and history of the team or community, fan loyalty can be reinforced. This will create “extra points” of attachment for fans (Heere, 2007). Another article stated that all sports leagues “could benefit from developing programs which reinforce the authenticity and history and tradition drivers of fan loyalty” (Passikoff, 1997).

Chapter 3

Study

In a study conducted at Penn State University, Dr. Wayne DeSarbo sought to uncover the different ways that students expressed themselves as avid fans of the university's football team for the 2008 season. At Penn State University, football remains the most popular and dominant sport, with attendance of over 100,000 at football games, and high national poll ranking each year (DeSarbo, 2009). Initially, in-depth interviews were conducted to generate a list of 35 different activities and expressions that would pertain to the football team. A list of the 35 activities found on the questionnaire and their numeric labels can be seen in Table 1. Students completing the survey could choose as many activities as they wanted to characterize their following of the football team. Along with the 35 questions on activities for the student, the questionnaire included questions on the interest, involvement, and attitudes on fan avidity, as well as demographic and psychographic questions. A copy of the questionnaire is found in Appendix A (DeSarbo 2009, 2010).

This questionnaire was distributed to marketing students at Penn State University who would receive extra credit for completing the questionnaire. A total of 307 questionnaires were completed. Figure 1 shows the percentage of the 307 students who selected each activity showing which activities were most popular among all of the students (DeSarbo, 2010). There are profound differences among the percentages, the most popular activity being watching Penn State play on TV, with only 1% saying they have tried out for the Dance team that performs at Penn State football games.

Chapter 4

Analysis

The primary objective of this analysis is to uncover market segments from the 307 students surveyed and determine alternative paths to fan avidity as well as each segment's main drivers of fan avidity. These market segments will be uncovered using the different activities that Penn State fans selected on the questionnaire as they relate to avidity. Table 2 lists a summary of all of the major steps and analyses used throughout this research to determine market segments and drivers of fan avidity. The 35 activities listed on the questionnaire are found in Table 1. The fan avidity scores are taken from Question 5 in the Interests/Attitudes section of the questionnaire which asked students to agree-disagree to the statement, "I am an avid PSU sports football fan."

The correlations between these 35 activities and fan avidity are found in Table 3. The analysis shows that all of the 35 activities besides two are positively correlated to fan avidity as evidenced by the positive Pearson Correlation statistics. The majority of the 35 activities were also found to statistically significant with regards to correlation with fan avidity (see first column of Table 3). This demonstrates that the activities measured in the questionnaire are significantly related to an individual's expression of fan avidity. Table 3 also shows strong correlations among the 35 activities with each other. Many of these correlations are also statistically significant. Such collinearity can distort estimates of resulting regression coefficients, and thus actions will need to be taken to attempt to reduce this collinearity (McDaniel, 2007).

To begin to understand and show the relationship between these 35 activities and fan avidity, Ordinary Least Squares Regression was applied using SPSS Statistical

software using the “Enter” method. Table 4 shows that the aggregate regression analysis is significant at $p < .001$, with $R^2 = .553$. As displayed in Table 5, which lists the aggregate regression analysis coefficients, several of the activities were found to be significant predictive of fan avidity: attend one home game, play as PSU football team in video games, collect PSU football memorabilia, use the internet to follow PSU football or the Big Ten, and purchase PSU football clothing. While the aggregate regression analysis was found to be significant, Table 5 also shows that many of the regression coefficients are negative due to the collinearity exhibited in Table 3 (Condition indices also verified this problem). Table 3 showed that all but two of the 35 activities are positively correlated to fan avidity, which would lead the regression coefficients to also be positive. To reduce this collinearity and be able to uncover significant variables, a second aggregate regression analysis in SPSS was completed using the Stepwise Regression method.

The results of the Stepwise Regression analysis are found in Tables 6-8. Model 10 in step 10 from the procedure exhibits the 10 strongest activities relating to fan avidity. This stepwise regression analysis is also found to be significant with $R^2 = .528$. Tables 7-8 exhibit how the stepwise method was able to reduce collinearity, with all of the resulting activities listed having positive regression coefficients. The variance inflation factor (VIF) scores for each activity also appear to be closer to 1, which shows that there is less collinearity. The 10 activities listed in model 10 constitute the most important activities in describing fan avidity. They are: purchase PSU football clothing, play as PSU football team in video games, attend one home game, use the Internet to follow PSU football or the Big Ten, attend blue-white game, collect PSU football

memorabilia, try out or become member of cheerleading squad, purchase 2008 season tickets, listen to games on the radio, and read about football in the Collegian. These activities constitute the most important drivers of fan avidity for the sample as a whole. All five of the significant variables found in the first aggregate regression analysis are also found in the stepwise analysis, as they are the variables that have the strongest relationship to fan avidity. Three of the ten variables are related to some kind of purchasing behavior, two relate to attending games, three relate to following the team through various mediums, and two are other behaviors.

Marketing implications can be drawn from these regression analyses which point to certain important activities in regards to fan avidity. One of the most important drivers was identified to be “purchase PSU football clothing.” This could show the importance of having a variety of football clothing available for purchase for these avid fans both in locations at Penn State, as well as online methods. Another important driver was found to be “play as PSU football team in video games.” Marketers could use this knowledge that video game behavior is found in avid fans and incorporate promotions and sponsorships that involve video game manufacturers or video games. One other activity of note was the activity of attending “one home game.” While Penn State fans can be found nationwide, this analysis shows that attending a game in person is still very important to avid fans. Marketers could use this knowledge to make sure they are providing the best possible experience on game days at Penn State. Marketers could also work to make sure the strategy for allotting ticket accounts for avid fans, who may pay more to see Penn State play. While this regression analysis does point to certain activities as being the driving activities behind fan avidity, it does not examine the

heterogeneity of the 307 students surveyed, or attempt to form market segments.

We now wish to examine whether there are multiple segments of students within this sample. In order to understand the heterogeneity of these students, these unknown market segments will have to be uncovered. Latent class regression will “simultaneously estimate the number of market segments, their size and composition, and the segment specific regression coefficients” (DeSarbo, 2006). However, given the partitioning of the sample into smaller segments with latent class regression, resultant collinearity with the 35 activities will be worse than in the aggregate regression analysis. As such, it is first important to reduce the number of independent variables.

Principal Components Analysis

Because of the large number of variables, a principal components analysis (PCA) was first completed prior to the latent class regression technique being applied. This technique is “a statistical approach that can be used to analyze interrelationships among a large number of variables and to explain these variables in terms of their common underlying dimensions” (Hair, 2007). This method condenses the amount of information to create a “smaller set of variates with a minimal loss of information” (Hair 2007). Table 9 shows the results for the extraction of factors using principal components analysis. In Table 9, the 35 derived components are listed with their information content as expressed by their eigenvalues. The latent root criterion was used to determine the number of factors to retain (Guttman, 1945). Employing this methodology, which retains factors greater than 1, 11 factors are retained. Interpreting this chart shows that 60.57% of the variance is explained by these 11 factors.

These 11 factors were extracted and VARIMAX rotated for interpretation. This

matrix “represents the degree of association of each variable with each factor” (Hair, 2007) A VARIMAX- rotated component matrix is shown in Table 10. The matrix is examined for patterns of large factor loadings with the objective of finding a “simplified structure” (Hair, 2007). In the rotated factor matrix, large loadings were observed and noted, according to their value and sign. The 11 factors were studied and named according to which of the 35 activities were loaded high on each of the different factors. The process of analyzing the factor loadings and assigning names is “based primarily on the subjective opinion of the researcher (Hair, 2007).

Here, Factor 1 was named the “Social” factor based on information derived from the VARIMAX Rotated Component Analysis Factor Matrix located in Table 10. Studying the matrix, it can be observed that there are several activities that load very high on Factor 1 of the matrix including: wear PSU colors during the football game, participate in post game celebrations or parties, and tailgate at Beaver Stadium. These activities appear to have some sort of “social” aspect, and were thus combined to create the name for Factor 1. Factor 2 was labeled “Purchasing” because the activities that loaded the higher were: purchase merchandise, purchase PSU football clothing, and collect PSU football memorabilia. Factor 3, the “Live Following” factor, included activities such as: listen to games over the internet, watch games over the internet, and listen to games on the radio. All of these activities included following the PSU football team live. Factor 4 was comprised of activities that constituted following both Penn State *and* the Big Ten was labeled “Enthusiastic Following”. The activities that loaded high for this factor were: use the Internet to follow PSU football or the Big Ten, read about football in the Collegian, and watch games on TV at home. Factor 5 was labeled the

“Travel” factor because the activities included both attending the Rose Bowl and one away game. Factor 6 was labeled “On Field Entertaining” because the activities that loaded the highest were trying out or becoming a member of the Cheerleading Squad or Dance Team, both of which entertain during football games. Factor 7 was labeled “Alternative Football Activities” because the activities that loaded the highest for this factor were activities that weren’t typical PSU football activities and didn’t involve actually attending or watching PSU football. These activities included: play as PSU football team in video games and participate in friendly wagers. Factor 8 was labeled the “Rallying” factor to describe extreme fan behavior in rallying around a team. The activities that loaded high for this factor were: camp out for good seats in Paternoville, use blue/white face or body paint, and attend pep rallies. Factor 9 was labeled “Tutoring” because the activity of helping to tutor football players loaded the highest. Factor 10 was labeled the “Working” factor because the activities that loaded the highest were helping to clean Beaver Stadium following the game and working at PSU football games. Lastly, Factor 11 was labeled “Join/Try out for team”. This is because overwhelmingly the activity that loaded the highest was: Join or try out for team. Table 11 lists the names of all of the derived factors from the Principal Components Analysis. Given the orthogonality of these derived rotated components, the resulting component scores will be used as independent variables in the latent class regression.

Latent Class Regression

Table 12 shows the aggregate regression analysis (k=1 market segment) for the 11 factors derived from the Principal Components Analysis. The regression is significant ($p < .001$), with R^2 being equal to .495. The VIF Collinearity statistics exhibit that the 11

factors are completely uncorrelated. Six of the 10 factors were found to be significant in the regression analysis: Social, Purchasing, Live Following, Travel, Alternative Football Activities, and Rallying. All regression coefficients are positive.

One of the most significant factors was found to be Purchasing, which again shows marketing managers the importance that fans place on buying merchandise and memorabilia relating to their favorite sports team. Also significant was the Social factor, which includes tailgating and celebrating with friends. This social aspect is important for marketers to realize as they try to understand their most avid fans. A third significant factor was the Enthusiastic Following factor, which includes activities such as using the Internet and the TV to follow both Penn State football and Big Ten football coverage. This exhibits that avid Penn State fans may also avidly follow Big Ten rivals. Marketers can use this information to place advertisements or obtain a presence in this other media to foster relationships with these fans.

The DeSarbo and Edwards (1998) constrained latent structure software was next used to perform an analysis on the 11 factors and attempt to derive market segments from the data. Positivity constraints were imposed on the coefficients of the derived PCA's. The number of segments can be determined from information criteria to determine K^* , the optimal number of market segments. The method, shown below, "imposes a penalty on the likelihood that is related to the number of parameters estimated" (Wedel, 1998).

$$C = -2\ln L + Pd$$

With this criteria, "P is the number of estimated parameters, and d is some constant" (Wedel, 1998). The Akaike information criterion (AIC), arises when $d=2$. The Bayesian information criterion (BIC) and consistent Akaike information criterion (CAIC) arise

when $d=\ln(I)$ and $d=\ln(I+1)$, respectively (Wedel, 1998). These BIC and CAIC statistics are found to be more conservative because they tend to favor models with fewer segments (Wedel, 1998).

Table 13 presents the various heuristics for solutions $K^*=1, 2, 3, 4, 5,$ and 6 . It is shown that the log likelihood always improves with increasing K^* , however the various information heuristics are not consistent. The AIC points to $K^*=6$, while the AIC3 points to $K^*=5$. However, both the minimum BIC and CAIC point to $K^*=2$. These latter criterion are more conservative statistics, and studies also have also indicated that “CAIC is preferable in general for mixture models” (Wedel, 2006). Based on this information, $K^*=2$ was chosen as the optimal number of segments.

Table 14 shows the derived parameter estimates for the $K^*=2$ solution. Segment 1 has 97 students assigned to it (31.6%), while Segment 2 has 210 students (68.4%). The regression coefficients for each segment are presented in order to describe the segments. Overall, Segment 1 derives its fan avidity from the following 7 factors that were found to be significant: Purchasing, Live Following, Enthusiastic Following, Travel, On Field Entertaining, Alt. Football Activities, and Rallying. The highest regression coefficients came from Purchasing and Enthusiastic Following, so this segment will be aptly named “Enthusiastic Purchasers” segment. Segment 2 has significant regression coefficients for the following factors: Social, Purchasing, Enthusiastic Following, Travel, Alt. Football Activities, Rallying, and Tutoring. The highest regression coefficient for this segment came from Factor 1, the Social factor, which included tailgating and celebrating wins.. Segment 2 was thus named the “Social” segment.

The two segments had an overlap of significant activities between them. The

following factors were found to be significant in both segments: Purchasing, Enthusiastic Following, Alt. Football Activities, and Rallying. These factors appear to be drivers of fan avidity in both observed segments. However, there are unique differences that lend to the different segments. When looking at these segments to observe differences, it appears that fans in Segment 1 are more enthusiastic about following the actual team and game. They follow games live on television or the Internet when not attending games, travel to away and bowl games, and read about the team and Big Ten network through various mediums throughout the season. Segment 2 appears to be more of a social segment. Important activities to this segment would include participating in post game celebrations and parties, tailgating, and attending the blue and white game. The two derived segments must now be analyzed to determine if there are significant differences among the segments, especially as it relates to fan avidity.

T-Test Analysis

The segments were then profiled against each other using information from the student questionnaires. Independent T-Tests were run to describe the significant differences between the two segments. Tables 15-16 show the means for the two segments for all of the items on the questionnaire. An asterisk ($p < .05$) was placed next to the items where there was found to be a significant difference between the two segments. Many significant differences were observed between the two segments in terms of personal perspectives of Penn State Football, the activities that these fans participated in, significant interests and attitudes, as well as demographic information.

Most notably, there was a significant difference between the two groups' mean ratings of an avid PSU football fan. The "Social" segment was shown to be significantly

more avid than the “Enthusiastic Purchasers” segment. While both segments appear to exhibit some fan avidity, it is evident that the fan in the “Social” segment exhibit more avidity. The “Social” segment was also found to have significantly higher means for several of the questions asked in the personal perspectives section of the questionnaire such as “How interested are you in Penn State football?” Looking at the 35 activities, the “Social” segment has statistically significant higher means for many of the 35 activities chosen in the questionnaire. The same is true when analyzing the Interests and Attitudes section of the sports fans, with the “Social” segment appearing to have more positive attitudes about Penn State football and have interests that coincide with sports and Penn State.

When looking at demographic information, there does not appear to be many statistical differences between the two segments. There are no observable differences with respect to gender, age, major, or most of the other factors studied. The lone significant difference is belonging to a Fraternity, where the “Social” segment has more fans that belong to one. This T-Test analysis provided information on the general makeup of the two segments. It also provided information that could lead marketers to choose to target the “Social” segment as the primary segment, as it is shown to be the more avid segment.

Chapter 5

Discussion of Results

The sports industry is a booming industry, with revenues exceeding \$400 billion. Endemic to all sports is the topic of fan avidity. Various trade journal articles have documented the fact that avid fans spend more on sports and consume more merchandise, and a recent article has described that avid fans also recognize and buy from sports sponsors more. A recent study (DeSarbo 2009, 2010) has showed that single item measures currently in use by sports marketing firms in studying fan avidity are not sufficient in capturing the heterogeneity of these fans and their expressions. This research has used the same study in an attempt to derive market segments from those studied to understand different pathways to fan avidity, and the different factors that drive fan avidity.

An Aggregate Regression Analysis was done using the “Enter” and “Stepwise” methods to observe which of the 35 activities used in the questionnaire could best be used to describe fan avidity across the entire sample. It was found that activities such as attending a home game, playing as PSU in a videogame, collecting merchandise, using the Internet to follow the team, and purchasing clothing were all significant coefficients. A Principal Components Analysis was completed in an attempt to reduce the number of variables. Eleven factors were derived and named from this analysis. Constrained Latent Class Regression was performed on these eleven factors to understand which of these factors were significant in describing fan avidity as well as to determine the number of market segments within those surveyed. Two market segments were derived, and the posterior probabilities of membership into these segments were also assigned. The two

market segments were named “Enthusiastic Purchasers” and “Social” based on significant factors that made up the segments. T-Tests were run to determine significant differences among the segments. While there did not appear to be significant demographic differences between the segments, the “Social” segment was found to be comprised of significantly more avid PSU football fans. The “Social” segment was also found to have significantly higher means for most of the activities and interests. This segment could thus be identified as a target segment because of the higher fan avidity and higher revenue generating activities.

Through this analysis, different pathways to fan avidity were observed. One pathway, which was exhibited by the “Enthusiastic Purchasers” segment, included drivers including: following the football team and its games live, making purchases of football related merchandise, and traveling to games. The second pathway is evident by the “Social” segment. This pathway is driven primarily by social activities, as well as purchasing merchandise, and traveling and cheering for the team. The Purchasing factor appears to be an important driver in both pathways, and is made up of activities such as purchasing merchandise, purchasing football clothing, and collecting memorabilia. Also important to note is that while both segments appear to include avid fans, the “Social” segment is revealed to be significantly more avid, and thus may be a good target segment for Marketers. Because many of the factors overlap between the two segments, it appears that the social aspect may be an important driver of fan avidity for these Penn State football fans.

Managerial Implications and Future Recommendations

The importance of analyzing and understanding fan avidity has been discussed and is especially important for those involved in marketing in the sports industry. Fans represent a large portion of revenues for sports teams and leagues, and understanding and segmenting them can help to create successful marketing programs that can be tailored to specific fan segments. A recent challenge in the sports industry is that sports fans “have never had so many options, opportunities, places, and events to spend their time and money” (Rein 2006). Not only is the sports marketplace crowded, but there are also many other entertainment options at home that are vying for people’s attention. Understanding fans and having a successful strategy is a “critical concern” as fans become “harder to reach, attract, and retain” (Rein, 2006).

This research has uncovered that at Penn State, there appears to be two different student market segments: “Enthusiastic Purchasers” and “Social”. The Purchasing factor appears to be a driver of fan avidity in both segments. Marketing managers could use this information to realize that to their avid fans, purchasing memorabilia and sports clothing is very important. This relates to information discussed previously, as fans may wish to purchase and consume related goods as a way of expressing their identity with a team. Marketing managers should realize the importance of this action, and provide a wide variety of goods and merchandise to cater to the many levels of fans. Engaging in sponsorship and licensing deals could also aid marketers in developing products that would suit fans needs. Marketing managers could survey these avid fans to determine what products that fans would enjoy that would display a team’s logo or name.

The significantly more avid segment was found to be the “Social” segment. Avid

fans were described as being the most important fans for sports teams because avid fans spend more, recognize sponsors, and are much more interested in following and attending sporting events. This study showed that social activities such as tailgating, celebrating, and partying with fans after games are important significant drivers of fan avidity. Marketing managers should use this knowledge in their marketing strategies. It may be important for sports teams to improve tailgating areas and conditions for fans to keep these tailgating avid fans happy and coming back to attend more games. Improving these areas could also drive in fans that may attend games for solely the social function. Also, as these avid fans appear to participate in post game celebration and parties, teams should use this knowledge and perhaps sponsor post game celebrations, or create after game events, where fans could celebrate with other avid fans. Continuing a relationship with the fans after the live event could improve fan relationships and increase fan loyalty.

Other significant drivers that were found in both market segments include factors such as enthusiastically following the team and the Big Team conference on the Internet, television, and newspapers. Staying informed about Penn State football happenings appears to be very important to avid fans, and marketing managers should capitalize on this by providing exclusive up to date news on websites or offering weekly or daily e-newsletters that could be e-mailed to avid subscribers. Creating an online community for avid fans could allow them to consume information of importance to them, as well as allow fans to interact with each other online. Another driver of fan avidity found in both market segments was the Travel factor. This included activities such as attending away games or attending the 2009 Rose Bowl. Marketers could cater to these avid fans by providing packages and deals that would make traveling to games easier and affordable.

By sponsoring away game buses or trips, fans could travel together to see their favorite team play on the road. Marketers should also consider running promotions for away games to highlight and garner interest in these games for fans that haven't traveled for this experience in the past.

If replicating this study at another university, it would be interesting to observe how many market segments of fans would be generated, and the drivers of these market segments. These could be compared to the segments found at Penn State to determine if there is some homogeneity among college football fans. It would also be interesting to see if social factors appear to be important drivers of fan avidity at other universities, where the football culture may be extremely different. Future research could attempt to also track avidity of college football fans as they progress through their 4 years of college. It would also be extremely interesting to replicate this study for a professional sports team where the fan base would be much more heterogeneous demographically.

Table 1
Football Activity Descriptions (DeSarbo, 2010)

Number	Activity Description
1	One home game
2	One away game
3	Listen to games on the radio
4	Read about football in the Collegian
5	Purchase merchandise
6	Attend Rose Bowl
7	Read about football in the Centre Daily Times
8	Purchase 2008 season tickets
9	Play as PSU football team in video games
10	Watch games on TV at home
11	Collect PSU football memorabilia
12	Join or try out for team
13	Purchase sports magazines to read on Big Ten football
14	Use the internet to follow psu football or the big ten
15	Participate in friendly wagers
16	Watch games at restaurant or bar
17	Attend blue-white game
18	Purchase psu football clothing
19	Listen to games over the internet
20	Watch games over the internet
21	Watch Big Ten channel's football coverage
22	Attend Pep Rallies
23	Tailgate at Beaver Stadium
24	Purchase or subscribe to blue-white magazine
25	use blue/white face or body paint
26	participate in post game celebrations or parties
27	Try out or become member of cheerleading squad
28	try out or become member of marching band
29	Try out or become member of Dance team
30	Wear psu colors during the football games
31	Help tutor football players
32	Join the nittany Lion Club
33	Camp out for good seats in Paternoville
34	Work at psu football games
35	Help to clean Beaver Stadium following the game

Table 2
List of Steps in Analysis

Step	Name	Purpose
1	Aggregate Regression Analysis	This analysis was done in order to observe the main activities that drive fan avidity for the sample as a whole.
2	Stepwise Regression Analysis	This analysis was completed in order to attempt to reduce the collinearity found in the aggregate regression analysis and observe the top drivers of fan avidity.
3	Principal Components Analysis	This analysis was completed in order to reduce the number of independent variables to a smaller set of factors.
4	Constrained Latent Class Regression	This regression analysis was completed on the 11 derived factors from the Principal Components Analysis to derive market segments as well as the drivers by segment.
7	Post-hoc T-Test Analysis	T-Tests were run to be able to describe the significant differences between the two segments.

Table 4
Aggregate Regression Analysis

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.744 ^a	.553	.496	.728736

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	178.256	35	5.093	9.590	.000 ^a
	Residual	143.916	271	.531		
	Total	322.173	306			

b. Dependent Variable: Dep

Table 5
Aggregate Regression Analysis Coefficients

		Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	-2.538	.280		-9.067	.000		
	One home game	.648	.197	.193	3.295	.001	.479	2.088
	One away game	.214	.146	.073	1.464	.144	.662	1.511
	Listen to games on the radio	.193	.112	.086	1.728	.085	.668	1.496
	Read about football in the Collegian	.272	.174	.077	1.563	.119	.688	1.454
	Purchase merchandise	-.191	.186	-.077	-1.030	.304	.297	3.365
	Attend Rose Bowl	-.052	.201	-.013	-.257	.797	.674	1.483
	Read about football in the Centre Daily Times	.048	.107	.022	.445	.656	.669	1.495
	Purchase 2008 season tickets	.234	.114	.104	2.065	.040	.644	1.554
	Play as PSU football team in video games	.350	.110	.169	3.178	.002	.581	1.721
	Watch games on TV at home	.238	.287	.041	.827	.409	.666	1.502
	Collect PSU football memorabilia	.233	.103	.113	2.256	.025	.661	1.514
	Join or try out for team	.163	.392	.018	.415	.679	.877	1.141
	Purchase sports magazines to read on Big Ten football	.106	.122	.042	.869	.386	.709	1.411
	Use the internet to follow psu football or the big ten	.307	.136	.116	2.247	.025	.615	1.627
	Participate in friendly wagers	-.056	.098	-.026	-.567	.571	.802	1.247
	Watch games at restaurant or bar	.029	.126	.011	.228	.820	.665	1.503
	Attend blue-white game	.361	.125	.147	2.881	.004	.633	1.580
	Purchase psu football clothing	.553	.195	.216	2.843	.005	.287	3.487
	Listen to games over the internet	-.123	.160	-.039	-.766	.444	.623	1.605
	Watch games over the internet	.091	.135	.032	.674	.501	.720	1.389
	Watch Big Ten channel's football coverage	.125	.129	.051	.973	.332	.591	1.692
	Attend Pep Rallies	-.124	.099	-.060	-1.250	.212	.710	1.407
	Tailgate at Beaver Stadium	-.139	.180	-.043	-.769	.442	.528	1.895
	Purchase or subscribe to blue-white magazine	-.179	.271	-.032	-.660	.510	.682	1.466
	use blue/white face or body paint	.128	.113	.056	1.133	.258	.682	1.466
	participate in post game celebrations or parties	-.098	.161	-.034	-.607	.545	.530	1.885
	Try out or become member of cheerleading squad	.773	.423	.113	1.830	.068	.435	2.300
	try out or become member of marching band	.422	.528	.041	.799	.425	.642	1.559
	Try out or become member of Dance team	-.013	.665	-.001	-.019	.985	.405	2.472
	Wear psu colors during the football games	.231	.232	.059	.997	.320	.465	2.151
	Help tutor football players	-.387	.358	-.048	-1.080	.281	.843	1.186
	Join the nittany Lion Club	-.075	.138	-.026	-.540	.590	.685	1.460
	Camp out for good seats in Patemoville	.133	.143	.042	.932	.352	.798	1.254
	Work at psu football games	.040	.148	.012	.268	.789	.847	1.181
	Help to clean Beaver Stadium following the game	.204	.210	.041	.968	.334	.898	1.113

a. Dependent Variable: Dep

Table 6
Aggregate Regression Analysis – Stepwise Method

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.479 ^a	.229	.227	.902248
2	.578 ^b	.334	.330	.840131
3	.631 ^c	.398	.392	.800284
4	.666 ^d	.443	.436	.770746
5	.686 ^e	.471	.462	.752683
6	.702 ^f	.493	.483	.737703
7	.710 ^g	.504	.492	.731192
8	.717 ^h	.514	.501	.725184
9	.722 ⁱ	.521	.506	.721054
10	.727 ^j	.528	.512	.716884

ANOVA^k

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.887	1	73.887	90.764	.000 ^a
	Residual	248.286	305	.814		
	Total	322.173	306			
2	Regression	107.603	2	53.802	76.226	.000 ^b
	Residual	214.569	304	.706		
	Total	322.173	306			
3	Regression	128.115	3	42.705	66.679	.000 ^c
	Residual	194.058	303	.640		
	Total	322.173	306			
4	Regression	142.770	4	35.692	60.083	.000 ^d
	Residual	179.403	302	.594		
	Total	322.173	306			
5	Regression	151.647	5	30.329	53.535	.000 ^e
	Residual	170.526	301	.567		
	Total	322.173	306			
6	Regression	158.911	6	26.485	48.668	.000 ^f
	Residual	163.262	300	.544		
	Total	322.173	306			
7	Regression	162.315	7	23.188	43.371	.000 ^g
	Residual	159.858	299	.535		
	Total	322.173	306			
8	Regression	165.457	8	20.682	39.328	.000 ^h
	Residual	156.716	298	.526		
	Total	322.173	306			
9	Regression	167.757	9	18.640	35.851	.000 ⁱ
	Residual	154.416	297	.520		
	Total	322.173	306			
10	Regression	170.052	10	17.005	33.089	.000 ^j
	Residual	152.121	296	.514		
	Total	322.173	306			

Table 7
Stepwise Method Coefficients

		Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VF
1	(Constant)	-.984	.116		-8.516	.000		
	Purchase psu football clothing	1.229	.129	.479	9.527	.000	1.000	1.000
2	(Constant)	-1.119	.109		-10.237	.000		
	Purchase psu football clothing	1.023	.124	.399	8.267	.000	.942	1.062
	Play as PSU football team in video games	.688	.100	.333	6.912	.000	.942	1.062
3	(Constant)	-1.713	.148		-11.587	.000		
	Purchase psu football clothing	.767	.126	.299	6.075	.000	.821	1.218
	Play as PSU football team in video games	.616	.096	.298	6.429	.000	.925	1.081
	One home game	.928	.164	.277	5.659	.000	.832	1.202
4	(Constant)	-2.026	.156		-13.012	.000		
	Purchase psu football clothing	.667	.123	.260	5.412	.000	.799	1.251
	Play as PSU football team in video games	.462	.097	.224	4.753	.000	.832	1.202
	One home game	.880	.158	.262	5.563	.000	.829	1.207
	Use the internet to follow psu football or the big ten	.618	.124	.235	4.967	.000	.827	1.209
	Attend blue-white game	.453	.114	.185	3.958	.000	.809	1.237
5	(Constant)	-2.124	.154		-13.785	.000		
	Purchase psu football clothing	.587	.122	.229	4.804	.000	.777	1.287
	Play as PSU football team in video games	.413	.096	.200	4.310	.000	.818	1.223
	One home game	.730	.159	.218	4.592	.000	.782	1.279
	Use the internet to follow psu football or the big ten	.577	.122	.219	4.730	.000	.821	1.218
	Attend blue-white game	.453	.114	.185	3.958	.000	.809	1.237
	Collect PSU football memorabilia	.341	.093	.165	3.654	.000	.824	1.213
6	(Constant)	-2.059	.152		-13.542	.000		
	Purchase psu football clothing	.467	.124	.182	3.766	.000	.723	1.383
	Play as PSU football team in video games	.424	.094	.205	4.509	.000	.817	1.224
	One home game	.657	.157	.196	4.182	.000	.769	1.300
	Use the internet to follow psu football or the big ten	.534	.120	.203	4.448	.000	.813	1.230
	Attend blue-white game	.422	.112	.172	3.756	.000	.804	1.244
	Collect PSU football memorabilia	.341	.093	.165	3.654	.000	.824	1.213
	Try out or become member of cheerleading squad	.722	.286	.105	2.523	.012	.955	1.047
7	(Constant)	-2.115	.152		-13.884	.000		
	Purchase psu football clothing	.489	.123	.190	3.965	.000	.720	1.390
	Play as PSU football team in video games	.412	.093	.199	4.419	.000	.815	1.227
	One home game	.721	.158	.215	4.570	.000	.749	1.335
	Use the internet to follow psu football or the big ten	.508	.119	.193	4.250	.000	.807	1.239
	Attend blue-white game	.417	.112	.170	3.738	.000	.804	1.244
	Collect PSU football memorabilia	.331	.093	.160	3.573	.000	.823	1.216
	Try out or become member of cheerleading squad	.722	.286	.105	2.523	.012	.955	1.047

Table 8
Stepwise Method Coefficients (Cont.)

		Coefficients ^a						
8	(Constant)	-2.121	.151		-14.036	.000		
	Purchase psu football clothing	.471	.122	.184	3.849	.000	.717	1.394
	Play as PSU football team in video games	.393	.093	.190	4.231	.000	.809	1.236
	One home game	.594	.165	.177	3.606	.000	.675	1.481
	Use the internet to follow psu football or the big ten	.506	.118	.192	4.272	.000	.807	1.239
	Attend blue-white game	.386	.111	.157	3.468	.001	.794	1.260
	Collect PSU football memorabilia	.295	.093	.143	3.166	.002	.802	1.247
	Try out or become member of cheerleading squad	.749	.284	.109	2.638	.009	.954	1.049
	Purchase 2008 season tickets	.259	.106	.115	2.444	.015	.733	1.364
	9	(Constant)	-2.123	.150		-14.129	.000	
Purchase psu football clothing		.428	.124	.167	3.466	.001	.697	1.434
Play as PSU football team in video games		.404	.092	.196	4.370	.000	.806	1.240
One home game		.603	.164	.180	3.680	.000	.675	1.482
Use the internet to follow psu football or the big ten		.447	.121	.170	3.687	.000	.763	1.310
Attend blue-white game		.395	.111	.161	3.569	.000	.792	1.262
Collect PSU football memorabilia		.276	.093	.134	2.969	.003	.794	1.259
Try out or become member of cheerleading squad		.700	.283	.102	2.471	.014	.947	1.056
Purchase 2008 season tickets		.280	.106	.125	2.645	.009	.727	1.376
Listen to games on the radio		.204	.097	.090	2.103	.036	.872	1.146
10	(Constant)	-2.321	.176		-13.162	.000		
	Purchase psu football clothing	.410	.123	.160	3.332	.001	.694	1.441
	Play as PSU football team in video games	.394	.092	.191	4.287	.000	.804	1.243
	One home game	.598	.163	.178	3.671	.000	.675	1.482
	Use the internet to follow psu football or the big ten	.371	.126	.141	2.955	.003	.701	1.426
	Attend blue-white game	.378	.110	.154	3.425	.001	.788	1.269
	Collect PSU football memorabilia	.264	.093	.128	2.845	.005	.791	1.264
	Try out or become member of cheerleading squad	.774	.284	.113	2.726	.007	.933	1.072
	Purchase 2008 season tickets	.275	.105	.123	2.616	.009	.726	1.377
	Listen to games on the radio	.204	.096	.090	2.115	.035	.872	1.146
Read about football in the Collegian	.333	.158	.094	2.113	.035	.811	1.232	

a. Dependent Variable: Dep

Table 9
Results for the Extraction of Component Factors

Total Variance Explained										
Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings			
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	6.014	17.183	17.183	6.014	17.183	17.183	3.053	8.722	8.722	
2	2.703	7.723	24.906	2.703	7.723	24.906	2.663	7.609	16.331	
3	1.928	5.510	30.416	1.928	5.510	30.416	2.145	6.128	22.460	
4	1.666	4.761	35.177	1.666	4.761	35.177	2.010	5.743	28.203	
5	1.542	4.407	39.583	1.542	4.407	39.583	1.893	5.409	33.612	
6	1.395	3.985	43.568	1.395	3.985	43.568	1.892	5.405	39.017	
7	1.362	3.892	47.461	1.362	3.892	47.461	1.838	5.251	44.268	
8	1.234	3.525	50.986	1.234	3.525	50.986	1.769	5.056	49.323	
9	1.176	3.361	54.347	1.176	3.361	54.347	1.515	4.327	53.651	
10	1.123	3.208	57.555	1.123	3.208	57.555	1.240	3.544	57.195	
11	1.056	3.016	60.571	1.056	3.016	60.571	1.182	3.376	60.571	
12	.970	2.772	63.343							
13	.915	2.613	65.956							
14	.881	2.517	68.473							
15	.867	2.478	70.951							
16	.799	2.282	73.234							
17	.747	2.133	75.367							
18	.726	2.074	77.441							
19	.685	1.957	79.397							
20	.663	1.895	81.293							
21	.622	1.778	83.071							
22	.604	1.727	84.798							
23	.596	1.702	86.500							
24	.559	1.597	88.096							
25	.547	1.563	89.659							
26	.530	1.514	91.173							
27	.504	1.439	92.613							
28	.435	1.242	93.854							
29	.427	1.219	95.073							
30	.402	1.149	96.222							
31	.343	.979	97.201							
32	.316	.902	98.103							
33	.277	.793	98.896							
34	.233	.666	99.562							
35	.153	.438	100.000							

Extraction Method: Principal Component Analysis.

Table 10
VARIMAX Rotated Component Analysis Factor Matrices

Rotated Component Matrix ^a											
	Component										
	1	2	3	4	5	6	7	8	9	10	11
Wear psu colors during the football games	.745	.236	.048	.162	.033	.028	-.082	-.006	-.092	.047	-.079
participate in post game celebrations or parties	.737	.036	.029	.173	-.016	-.109	.161	.049	-.089	-.172	.091
Tailgate at Beaver Stadium	.686	.317	-.003	.007	.004	-.029	.092	.015	.106	.124	-.054
Attend blue-white game	.557	.184	-.100	.190	.133	.010	.090	.229	-.090	.151	.037
Watch games at restaurant or bar	.432	.002	.251	.270	.002	-.015	.194	.152	.114	-.118	-.285
Purchase merchandise	.309	.768	.083	.080	.058	.065	.038	.042	-.017	-.086	-.059
Purchase psu football clothing	.326	.741	.131	.169	-.030	.020	-.002	.053	.116	-.078	-.032
Collect PSU football memorabilia	.018	.651	.128	.136	.080	-.019	.036	.272	-.092	-.020	.111
One home game	.434	.509	-.132	-.026	.139	-.221	.048	.071	.134	.063	-.072
Purchase 2008 season tickets	.227	.427	-.255	.090	.088	-.113	.192	.298	.050	.186	.151
Purchase sports magazines to read on Big Ten football	-.085	.391	.198	.221	.280	.004	.377	-.105	-.030	.213	-.097
Listen to games over the internet	-.038	.029	.764	.064	.068	.087	.115	.053	-.039	.015	-.004
Watch games over the internet	.062	.039	.677	-.005	.060	.065	.179	.010	-.015	.049	-.031
Listen to games on the radio	.003	.124	.663	.270	.054	.055	-.104	.089	.027	-.078	.132
Use the internet to follow psu football or the big ten	.115	.135	.129	.674	.070	.041	.250	.071	.007	-.039	.000
Read about football in the Collegian	.135	.149	.094	.645	-.015	-.166	.084	.083	.070	-.001	-.187
Watch games on TV at home	.398	.007	-.028	.585	-.011	.117	-.106	.021	.011	.121	.226
Watch Big Ten channel's football coverage	.344	.256	.205	.451	-.015	.004	.196	.067	-.078	-.058	.004
Attend Rose Bowl	.078	.044	.090	.076	.687	.077	-.126	-.117	.233	-.127	.300
One away game	.171	.035	-.028	-.132	.659	.012	.147	.240	-.100	-.252	-.011
Purchase or subscribe to blue-white magazine	-.093	.060	.062	.094	.644	.071	.054	.241	-.147	.252	-.154
Join the nittany Lion Club	.041	.201	.354	.018	.512	-.141	.084	.017	.267	.100	.068
Try out or become member of Dance team	.030	.008	.127	-.063	-.129	.882	.140	.022	.087	-.011	-.027
Try out or become member of cheerleading squad	-.097	-.054	.070	.016	.156	.851	.000	.059	-.034	.020	-.002
Play as PSU football team in video games	.164	.165	-.082	.273	.115	.079	.728	-.034	.052	-.086	.036
Read about football in the Centre Daily Times	-.016	-.113	.201	.212	.111	.041	.628	.242	-.069	-.044	-.092
Participate in friendly wagers	.193	.095	.227	-.135	-.167	.066	.590	.001	.054	-.037	.224
Camp out for good seats in Paternoville	-.054	.003	-.002	.141	.006	-.087	.139	.686	.158	.072	.087
use blue/white face or body paint	.149	.214	.153	-.036	.139	.064	.042	.652	-.166	-.036	-.041
Attend Pep Rallies	.200	.191	.047	.063	.115	.165	-.114	.600	.159	-.106	-.103
Help tutor football players	-.009	-.021	-.047	.010	-.039	-.083	.003	.137	.744	-.002	-.004
try out or become member of marching band	-.144	.086	-.012	.093	.147	.379	.045	-.083	.666	-.057	-.025
Help to clean Beaver Stadium following the game	.022	-.045	-.062	.041	-.041	.042	-.059	-.038	-.082	.782	-.009
Work at psu football games	.130	-.003	.248	-.171	.024	-.127	-.066	.068	.388	.483	-.038
Join or try out for team	-.047	-.001	.065	-.026	.068	-.036	.087	.013	-.022	-.032	.849

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 9 iterations.

Table 11
List of Factors Derived from Principal Components Analysis

Factor	Name
1	Social
2	Purchasing
3	Live Following
4	Enthusiastic Following
5	Travel
6	On Field Entertaining
7	Alternative Football Activities
8	Rallying
9	Tutoring
10	Working
11	Join/Try out for Team

Table 12
Aggregate Regression Analysis with 11 Factors

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.704 ^a	.495	.476	.742468

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	159.552	11	14.505	26.312	.000 ^a
	Residual	162.621	295	.551		
	Total	322.173	306			

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	.001	.042		.032	.975		
	REGR factor score 1 for analysis 1	.314	.042	.306	7.392	.000	1.000	1.000
	REGR factor score 2 for analysis 1	.437	.042	.426	10.290	.000	1.000	1.000
	REGR factor score 3 for analysis 1	.051	.042	.050	1.201	.231	1.000	1.000
	REGR factor score 4 for analysis 1	.342	.042	.334	8.069	.000	1.000	1.000
	REGR factor score 5 for analysis 1	.139	.042	.135	3.273	.001	1.000	1.000
	REGR factor score 6 for analysis 1	.071	.042	.069	1.662	.098	1.000	1.000
	REGR factor score 7 for analysis 1	.232	.042	.226	5.458	.000	1.000	1.000
	REGR factor score 8 for analysis 1	.177	.042	.172	4.167	.000	1.000	1.000
	REGR factor score 9 for analysis 1	.002	.042	.002	.056	.956	1.000	1.000
	REGR factor score 10 for analysis 1	.048	.042	.046	1.123	.262	1.000	1.000
	REGR factor score 11 for analysis 1	.029	.042	.028	.685	.494	1.000	1.000

a. Dependent Variable: Dep

Table 13
Latent Structure Regression Results (Goodness of Fit)

K	ln L	# Parameters	AIC	AIC3	BIC	CAIC	R ²	Entropy
1	-338.08	13	702.154	715.154	750.561	763.561	0.495	1
2	-283.99	27	621.982	648.982	722.519	749.519	0.777	0.6867
3	-251.21	41	584.424	625.424	737.091	778.091	0.887	0.4906
4	-218.46	55	546.92	601.92	751.717	806.717	0.96	0.5574
5	-184.88	69	507.768	576.768	764.695	833.695	0.976	0.6389
6	-166.5	83	498.994	581.994	808.052	891.052	0.987	0.6299

Table 14
K*=2 Solution Parameters

	1	2
Intercept	-0.437*	0.202*
1	0.114	0.549*
2	0.540*	0.399*
3	0.126*	0.004
4	0.444*	0.259*
5	0.277*	0.078*
6	0.221*	0.003
7	0.285*	0.208*
8	0.293*	0.086*
9	0.000	0.054*
10	0.100	0.035
11	0.046	0.012

*p<.05 testing whether a coefficient is significantly different from 0

Table 15
Segment Means Compared for the K*=2 Solution

	Segment 1	Segment 2
Significant Personal Perspectives of PSU Football		
How interested are you in PSU football	3.1546	3.7238 *
How would you describe your level of involvement	2.6082	3.2143 *
Compared to the average student.... your interest	2.7629	3.5952 *
Compared to the average student... involvement	2.5361	3.2905 *
Interest in other sports	2.3814	2.5619
Involvement in other sports	1.8866	2.0571
Activities		
One home game	.7835	.9476 *
One away game	.0619	.1810 *
Listen to games on the radio	.2165	.3286 *
Read about football in the Collegian	.8866	.9190
Purchase merchandise	.6701	.8381 *
Attend Rose Bowl	.0515	.0762
Read about football in the Centre Daily Times	.2268	.4048 *
Purchase 2008 season tickets	.5979	.7524 *
Play as PSU football team in video games	.2784	.5095 *
Watch games on TV at home	.9588	.9714
Collect PSU football memorabilia	.2680	.5190 *
Join or try out for team	.0000	.0190
Purchase sports magazines to read on Big Ten football	.1237	.2476 *
Use the internet to follow psu football or the Big Ten	.7526	.8429
Participate in friendly wagers	.3093	.3524
Watch games at restaurant or bar	.7216	.8286
Attend blue-white game	.6289	.8429 *
Purchase psu football clothing	.7216	.8381
Listen to games over the internet	.1031	.1333
Watch games over the internet	.1237	.1714 *
Watch Big Ten channel's football coverage	.6804	.8143
Attend Pep Rallies	.3608	.4714
Tailgate at Beaver Stadium	.7938	.9286 *
Purchase or subscribe to blue-white magazine	.0000	.0524
use blue/white face or body paint	.1443	.3381 *
participate in post game celebrations or parties	.7423	.9048 *
Try out or become member of cheerleading squad	.0206	.0238
try out or become member of marching band	.0103	.0095
Try out or become member of Dance team	.0103	.0095
Wear psu colors during the football games	.8660	.9524 *
Help tutor football players	.0309	.0095
Join the nittany Lion Club	.1031	.1810
Camp out for good seats in Paternoville	.0619	.1476 *
Work at psu football games	.1237	.0952
Help to clean Beaver Stadium following the game	.0619	.0381

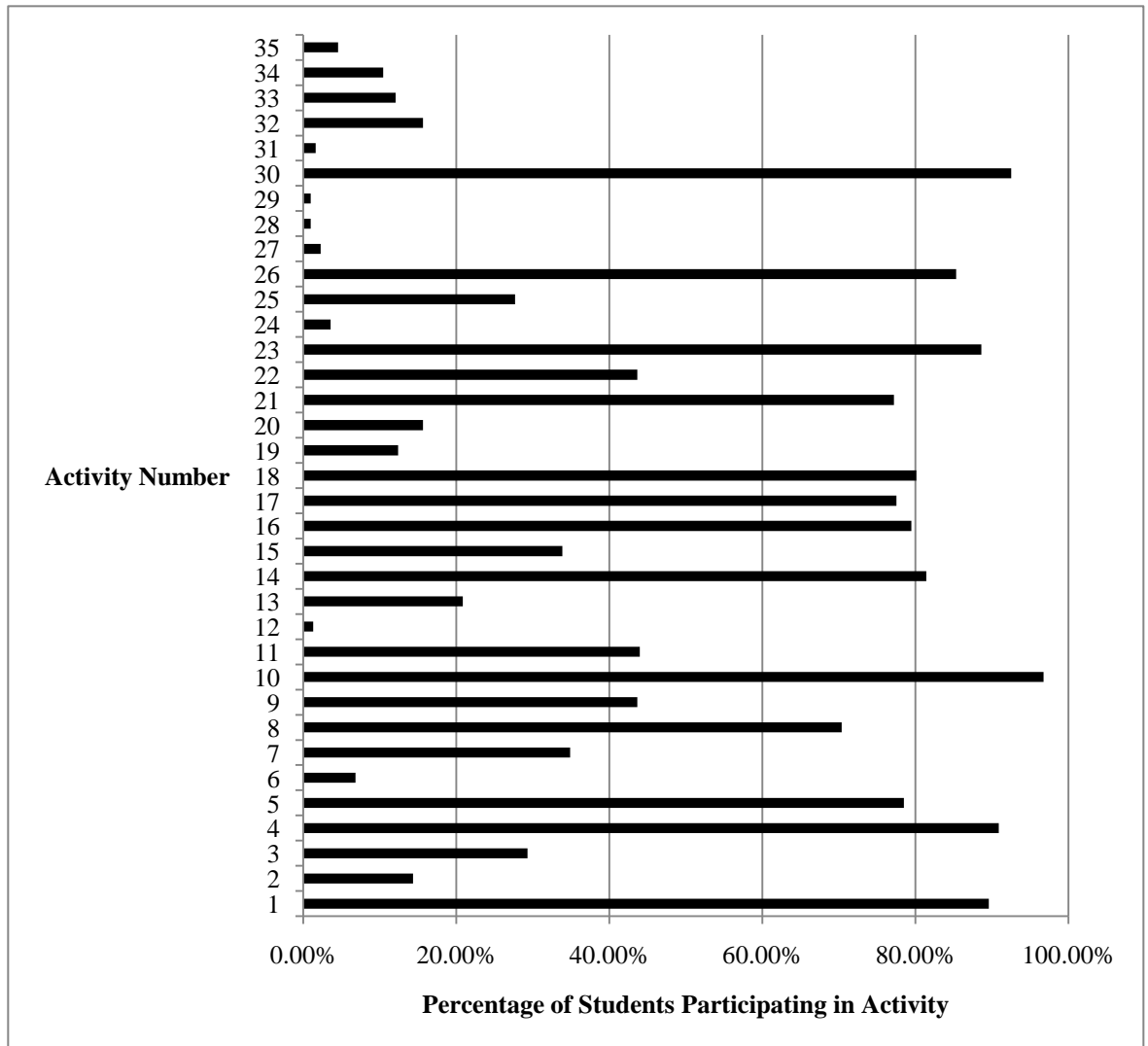
* Denotes Significance

Table 16
Segment Means Compared for the K*=2 Solution (Cont.)

	Segment 1	Segment 2
Significant Interests and Attitudes		
Played varsity in high school	4.9588	5.7286*
One of parents or siblings is psu alumnus	2.5773	2.9095
college athletics is a waste of time	1.8454	1.3619*
keep physically fit	5.6392	6.0571*
avid PSU football sports fan	4.2371	6.1524*
dislike attending psu sporting events	1.8660	1.4190*
knowledgeable football fan	3.9485	5.3714*
get frustrated and angry when psu does not win	4.1753	5.5333*
admire beauty of the sport	4.1340	5.1524*
socially active person	5.7835	6.1810*
enjoy talking about sports with friends	5.1443	6.0143*
imagine I am one of the football players	2.3402	3.5381*
people consider me to be studious	5.3299	5.5857
lose touch with what's happening around me	3.1959	4.4619*
admire football players	4.0515	5.1857*
expert on psu football	2.4227	3.7190*
pay attention mostly to athletes with the most notoriety	3.9175	4.4381*
visit web sites related to psu football	3.0206	4.3667*
play intramural sports	3.9485	4.5238
most of my friends are interested in psu football	5.9794	6.4619*
frequently attend fraternity/sorority parties	3.4021	3.9286
avid fan of big ten football	3.7423	5.3476*
avid NFL fan	4.4433	5.4714*
have paid higher than face value for tickets	3.3196	4.0476*
attend games for social experience	4.1753	3.4381*
watch college football games of different teams on TV	4.2268	5.2286*
compared to the average psu student, I tend to date less often	3.7526	3.4333
I emphasize my studies above the social aspects at psu	4.4742	4.3190
I would love a career in the sports industry	4.1340	4.9476*
avid fan of collegiate football	3.8660	5.4762
watch College Football Game Day on ESPN	3.9691	5.4286*
avid fan of other psu sports	3.9794	4.6619*
watch NFL games on TV	4.8454	5.5619*
I enjoy sports related movies	5.5567	5.9571*
part of the reason I chose to attend PSU was because of their football team	3.4021	4.6857*
Demographics		
Gender	.6186	.6381
Age	20.3299	20.2714
School year	2.7216	2.7524
Major	3.6082	3.6000
GPA	3.4924	3.5038
StudentAthlete	.0309	.0476
Fraternity	.1546	.2667*
Income	2.7113	2.6667

* Denotes Significance

Figure 1
Frequencies of 35 Activities



References

- Broughton, David. "Sweet Spots in Sponsor Loyalty." *SportsBusiness Journal* (2010): 15-16. Print.
- Capella, Michele. "Measuring Sports Fans' Involvement: The Fan Behavior Questionnaire." *Southern Business Review* 27 (2002). Print.
- "Columbus, OH Is the Number One Sports Town in the U.S." *Scarborough Sports Marketing*. 1 Oct. 2008. Web. 12 Mar. 2010.
<http://www.scarboroughsportsmarketing.com/assets/pdf/sportstowns_2008.pdf>.
- Dempster, A. P., N. M. Laird, and D. B. Rubin. "Maximum Likelihood from Incomplete Data via the EM Algorithm." *Journal of the Royal Statistical Society B39* (1977): 1-38. Print.
- DeSarbo, Wayne S., and Elizabeth A. Edwards. "Typologies of Compulsive Buying Behavior: A Constrained Clusterwise Regression Approach." *Journal of Consumer Psychology* (1998): 231-62. Print.
- DeSarbo, Wayne S., and W. L. Cron. "A Maximum Likelihood Methodology for Clusterwise Linear Regression." *Journal of Classification* 5: 249-82. Print.
- DeSarbo, Wayne S. "Measuring Fan Avidity Can Help Marketers Narrow Their Focus." *SportsBusiness Journal* (2009): 13. Print.
- DeSarbo, Wayne S., Robert Madrigal, and Robert Fox. *Examining the Multidimensional Expressions of Sports Fan Avidity (Working Papers)*. University Park: Penn State University. Working Papers. 2010.
- Grover, Rajiv, and Marco Vriens. *The Handbook of Marketing Research: Uses, Misuses, and Future Advances*. Thousand Oaks: Sage Publications, 2006. Print.

- Guttman, L. "Some Necessary Conditions for Common Factor Analysis." *Psychometrika* 19 (1945): 149-61. Print.
- Hair, Joseph F. *Multivariate Data Analysis*. Upper Saddle River, NJ: Prentice Hall, 2010. Print.
- Heere, Bob, and Jeffrey D. James. "Sports Teams and Their Communities: Examining the Influence of External Group Identities on Team Identity." *Journal of Sport Management* 21 (2007): 319-37. Print.
- Hunt, Kenneth A., Terry Bristol, and R. E. Bashaw. "A Conceptual Approach to Classifying Sports Fans." *The Journal of Services Marketing* 13.6 (1999): 439. *ProQuest*. Web. 1 Mar. 2010.
- Levey, Richard H. "Goal: Serving Fans | New Database Will Help NHL Reach Rooters." *DIRECT Magazine Online, the Information Resource for Direct Marketers | Direct Mail, Postal Mail, Email Marketing News and Resources*. Web. 29 Mar. 2010. <<http://directmag.com/casehistories/1001-nhl-database-reach-rooters/>>.
- Lynde, Tim. Lynde & Associates, 2007. Print.
- McDaniel, Carl D., and Roger H. Gates. *Marketing Research*. Hoboken, NJ: Wiley, 2007. Print.
- Passikoff, Robert. "Pro Sports Needs to Manage Fan Loyalty." *Brandweek* (1997): 29. Web.
- Rein, Irving J., Philip Kotler, and Ben Shields. *The Elusive Fan: Reinventing Sports in a Crowded Marketplace*. New York: McGraw-Hill, 2006. Print.
- Smith, Aaron, and Hans Westerbeek. *The Sport Business Future*. New York: Palgrave Macmillan, 2004. Print.

- "Sports Industry Overview." *Plunkett Research, Ltd.* Web. 27 Mar. 2010.
<<http://www.plunkettresearch.com/Industries/Sports/SportsStatistics/tabid/273/Default.aspx>>.
- Tajfel, Henri. *Differentiation between Social Groups: Studies in the Social Psychology of Intergroup Relations*. London: Published in Cooperation with European Association of Experimental Social Psychology by Academic, 1978. Print.
- Thorne, Scott, and Gordon C. Bruner. "An Exploratory Investigation of Hte Characteristics of Consumer Fanaticism." *Qualitative Market Research* (2006): 51. *ProQuest*. Web. 1 Apr. 2010.
- Wakefield, Kirk L. *Team Sports Marketing*. Amsterdam: Elsevier Butterworth-Heinemann, 2007. Print.
- Wann, Daniel L. *Sport Fans: the Psychology and Social Impact of Spectators*. New York: Routledge, 2001. Print.
- Wedel, Michel, and Wagner A. Kamakura. *Market Segmentation: Conceptual and Methodological Foundations*. Boston: Kluwer Academic, 1998. Print.
- Wedel, Michel. "Latent Structure Regression." *The Handbook of Marketing Research: Uses, Misuses, and Future Advances*. By Wayne S. DeSarbo and Wagner A. Kamakura. Thousand Oaks: Sage Publications, 2006. 394-417. Print.

PENN STATE (PSU) FOOTBALL STUDENT SURVEY

This research study concerns your interest and involvement in Penn State (PSU) Football. Specifically, we are interested in understanding the amount of emotional energy, time, and money you spend following the team, attending games, buying merchandise, etc. This is an auxiliary part of our research efforts to examine categorization and fan avidity processes in sports.

There are no right or wrong answers. Please complete **all** the questions in this questionnaire!

For each of the questions below, please answer it based on what you did this past 2008 football season.

Section I: Personal Perspectives about PSU Football

One of the many popular Fall activities on the Penn State campus concerns the PSU football team and the host of different entertainment activities associated with its Saturday games. While some of the student body actively participates in these weekend activities, other students choose not to.

Please answer each of the following questions below about Penn State football, in terms of:

- Your ***interest***: how concerned / curious you feel about it, and
- Your ***involvement***: your active pursuit in terms of time, money, and energy.

1. Overall, how *interested* are you in Penn State football? Check one category below:

- Not at all interested
- A little bit interested
- Somewhat interested
- Very interested

**2. How would you describe your level of *involvement* with Penn State football?
Check one category below:**

- Not at all involved
- A little bit involved
- Somewhat involved
- Very involved

3. Compared to the *average student* at PSU, how would your level of *interest* in Penn State Football relative to this average? Check one category below:

- Much less interested
- Less Interested
- About the same level of interest
- More interested
- Much more interested

4. Compared to the *average student* at PSU, how would you rate your level of *involvement* with Penn State Football relative to this average? Check one category below:

- Much less involved
- Less involved
- About the same level of involvement
- More involved
- Much more involved

5. How would you describe your level of *interest* in following *other Penn State Sports*? Check one category below:

- Not at all interested
- A little bit interested
- Somewhat interested
- Very interested

**6. How would you describe your level of *involvement* in *other Penn State Sports*?
Check one category below:**

- Not at all involved

- A little bit involved
- Somewhat involved
- Very involved

Section II: Your Activities Concerning PSU Football

Below is an extensive list of various PSU football-related activities that some students have chosen to become involved in during the football season. Please answer each question (check the appropriate box) to reflect the activities that you engaged in during the 2008 PSU football season. In particular, *did you*:

	YES	NO
1. Attend at least one home game?	<input type="checkbox"/>	<input type="checkbox"/>
2. Attend at least one away game?	<input type="checkbox"/>	<input type="checkbox"/>
3. Listen to the games on local radio?	<input type="checkbox"/>	<input type="checkbox"/>
4. Read about the PSU football team in the Daily Collegiate?	<input type="checkbox"/>	<input type="checkbox"/>
5. Purchase PSU football merchandise?	<input type="checkbox"/>	<input type="checkbox"/>
6. Attend the Rose Bowl game in Pasadena, CA.?	<input type="checkbox"/>	<input type="checkbox"/>
7. Read about the PSU football team in the Centre Daily Times?	<input type="checkbox"/>	<input type="checkbox"/>
8. Purchase 2008 PSU football season tickets?	<input type="checkbox"/>	<input type="checkbox"/>
9. Play as PSU football team in video games?	<input type="checkbox"/>	<input type="checkbox"/>
10. Watch PSU football game on TV at home?	<input type="checkbox"/>	<input type="checkbox"/>
11. Collect PSU football memorabilia?	<input type="checkbox"/>	<input type="checkbox"/>
12. Join or try out for the PSU football team?	<input type="checkbox"/>	<input type="checkbox"/>
13. Purchase sports magazines to read on Big Ten football?	<input type="checkbox"/>	<input type="checkbox"/>
14. Use the internet to follow PSU football or the Big Ten?	<input type="checkbox"/>	<input type="checkbox"/>
15. Participate in friendly wagers on the results of the PSU game?	<input type="checkbox"/>	<input type="checkbox"/>
16. Watch PSU football game on TV at restaurant or bar?	<input type="checkbox"/>	<input type="checkbox"/>
17. Attend the Blue-White football game in Spring?	<input type="checkbox"/>	<input type="checkbox"/>
18. Purchase PSU football clothing?	<input type="checkbox"/>	<input type="checkbox"/>
19. Listen (radio) to the PSU football games over the internet?	<input type="checkbox"/>	<input type="checkbox"/>
20. Watch (streaming video) the PSU football games over the internet?	<input type="checkbox"/>	<input type="checkbox"/>
21. Watch the Big Ten channel's football coverage?	<input type="checkbox"/>	<input type="checkbox"/>

- | | | |
|---|--------------------------|--------------------------|
| 22. Attend PSU football Pep Rallies? | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Tailgate at Beaver Stadium at games? | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. Purchase or subscribe to Blue-White Football magazine? | <input type="checkbox"/> | <input type="checkbox"/> |
| 25. Use blue/white face or body paint during a PSU football game? | <input type="checkbox"/> | <input type="checkbox"/> |
| 26. Participate in post game celebrations or parties? | <input type="checkbox"/> | <input type="checkbox"/> |
| 27. Try out or become a member of the PSU cheerleading squad? | <input type="checkbox"/> | <input type="checkbox"/> |
| 28. Try out or become a member of the PSU marching band? | <input type="checkbox"/> | <input type="checkbox"/> |
| 29. Try out or become a member of PSU Dance Team? | <input type="checkbox"/> | <input type="checkbox"/> |
| 30. Wear PSU colors during the PSU football game? | <input type="checkbox"/> | <input type="checkbox"/> |
| | YES | NO |
| 31. Help tutor PSU football players with their studies? | <input type="checkbox"/> | <input type="checkbox"/> |
| 32. Join the Nittany Lion Club (you or a member of your family)? | <input type="checkbox"/> | <input type="checkbox"/> |
| 33. Camp out for good seats in Paternoville? | <input type="checkbox"/> | <input type="checkbox"/> |
| 34. Work at PSU football games? | <input type="checkbox"/> | <input type="checkbox"/> |
| 35. Help to clean Beaver stadium following the game? | <input type="checkbox"/> | <input type="checkbox"/> |

Section III: Interests and Attitudes

Below are a number of statements concerning your interests and attitudes. Using the scale of +3 to -3 where +3 is *strongly agree* and -3 is *strongly disagree*, please tell us how much you agree or disagree with each statement by circling the appropriate response category.

Strongly Disagree				Strongly Agree		
-3	-2	-1	0	+1	+2	+3

1. I played varsity sports in high school -3 -2 -1 0 +1 +2 +3
2. One of my parents or siblings is a PSU alumnus -3 -2 -1 0 +1 +2 +3
3. I think college athletics is a waste of time -3 -2 -1 0 +1 +2 +3
4. I try to keep physically fit while attending PSU -3 -2 -1 0 +1 +2 +3
5. I am an avid PSU football sports fan -3 -2 -1 0 +1 +2 +3
6. I dislike attending PSU sporting events -3 -2 -1 0 +1 +2 +3
7. People who know me consider me to be a knowledgeable football fan -3 -2 -1 0 +1 +2 +3
8. I usually get very frustrated and angry when the PSU football team does
not win -3 -2 -1 0 +1 +2 +3
9. When I view PSU football, I tend to admire the beauty of the sport -3 -2 -1 0 +1 +2 +3
10. I tend to be a very socially active person -3 -2 -1 0 +1 +2 +3
11. I enjoy talking about sports to my friends -3 -2 -1 0 +1 +2 +3
12. I often imagine I am one of the football players on the field -3 -2 -1 0 +1 +2 +3
13. People who know me would consider me to be very studious -3 -2 -1 0 +1 +2 +3
14. When I view PSU football games, I get so into the action that I lose touch
with what is happening around me -3 -2 -1 0 +1 +2 +3
15. I tend to admire the PSU football players that compete -3 -2 -1 0 +1 +2 +3
16. I consider myself an expert on PSU football..... -3 -2 -1 0 +1 +2 +3
17. I usually pay attention mostly to athletes with the most notoriety -3 -2 -1 0 +1 +2 +3
18. I frequently visit web sites related to PSU football..... -3 -2 -1 0 +1 +2 +3
19. I play intramural sports at PSU..... -3 -2 -1 0 +1 +2 +3
20. Most of my friends are interested in PSU football..... -3 -2 -1 0 +1 +2 +3
21. I frequently attend fraternity/sorority parties -3 -2 -1 0 +1 +2 +3
22. I am an avid fan of Big Ten football -3 -2 -1 0 +1 +2 +3

Strongly Disagree		0		Strongly Agree		
-3	-2	-1	0	+1	+2	+3

23. I am an avid NFL fan -3 -2 -1 0 +1 +2 +3
24. I have paid higher than face value for tickets to watch PSU football -3 -2 -1 0 +1 +2 +3
25. I attend games for the social experience more than to watch the game action ... -3 -2 -1 0 +1 +2 +3
26. I frequently watch college football games of different teams on TV..... -3 -2 -1 0 +1 +2 +3
27. Compared to the average PSU student, I tend to date less often..... -3 -2 -1 0 +1 +2 +3
28. I emphasize my studies above the social aspects at PSU..... -3 -2 -1 0 +1 +2 +3
29. I would love a career somewhere in the sports industry..... -3 -2 -1 0 +1 +2 +3
30. I am an avid fan of collegiate football.....-3 -2 -1 0 +1 +2 +3
31. I frequently watch College Football Game Day on ESPN..... -3 -2 -1 0 +1 +2 +3
32. I am an avid fan of other PSU sports -3 -2 -1 0 +1 +2 +3
33. I frequently watch NFL football games on TV..... -3 -2 -1 0 +1 +2 +3
34. I enjoy sports related movies -3 -2 -1 0 +1 +2 +3
35. Part of the reason I chose to attend PSU was because of their football team..... -3 -2 -1 0 +1 +2 +3

Section IV: Background Information

This section contains background information that will assist in classifying the results of the study.

1. Are you? Male Female

2. How old are you? _____ years

3. Please indicate your status in the University (Check one box below):

Freshman Sophomore Junior
 Senior Graduate student Continuing Ed Program / Other

4. What is your major? _____

5. Please indicate your Grade Point Average (GPA): _____

6. Are you a Penn State student athlete playing varsity sports?

Yes No

If yes, which sport(s) do you play? _____

7. Are you a member of a fraternity or sorority here at PSU? Yes No

8. On average, how much discretionary income do you have each week? (Circle one)

\$0-\$20 \$21-\$40 \$41-\$60 \$61-\$80 \$81-100 \$101+

We wish to thank you for your assistance in completing this questionnaire. Again, your particular responses will be kept anonymous in all the analyses and subsequent reports. Please make sure all your responses are complete, and then hand in this completed questionnaire to the proctor in front of the class.

ACADEMIC VITA of Katelyn Cheyne

Katelyn Cheyne
3804 Killian Ct.
Murrysville, PA 15668
Kac920@gmail.com

Education: Bachelor of Science Degree in Marketing, Penn State University, Spring 2010
Minor in Legal Environment of Business
Thesis Title: Uncovering the Drivers of Sports Fan Avidity
Thesis Supervisor: Wayne DeSarbo

Awards:

President's Freshman Award
President Sparks Award
Evan Pugh Award for Juniors
Evan Pugh Award for Seniors
Beta Gamma Sigma Business Honors Society
Sapphire Program GPA Award
Department of Marketing Student Marshal Spring 2010

Activities

Phi Chi Theta Professional Business Fraternity
Smeal Student Mentors