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A Study of Fan's Loyalty to Products and Pro-baseball Team

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제품 및 프로야구팀에 대한 충성도 연구

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이 논문에서 우리는 어떤 종류의 사람이 프로야구팀을 가진 기업에 충성하며, 프로팀에 충성하는 지를 연구했다. 충성심은 몇 개의 변수로 측정이 되며, 몇 개의 변수들은 또 그 하위변수로 측정이 된다. 종속변수는 충성심, 독립변수는 고객의 연령, 성별, 고향이다. 우리는 기존 연구를 보다 심화하여, 독립변수의 2차원적 효과를 연구했다. 그 사용하는 방법은 분산분석 등이며, 여섯 가지 유의적인 결과를 발견했다. 그 결과 우리는 충성스런 고객과 그렇지 않은 고객을 확인했으며, 보다 더 세분화된 고객 분석으로부터 보다 효율적인 고객경영이 가능하게 될 수 있다는 점이 이 연구의 잇점이라고 할 수 있다.

Keywords : Product loyalty, Customer/fan, ANOVA, Sports marketing, Contingency table.

1. Introduction

Since the ancient Roman period when human beings enjoyed Roman holiday through gladiators' fighting in the colosseum, people have created and enjoyed sports continuously until now, and no one can deny that modern professional sports are enthroned at the total peak. In the professional sports there are many related persons, companies, profit, wild enthusiasm, etc. so that they have given birth to colossal sports industry, where we also have needed effective management. We can find many useful research papers on sports industry management. Table 1 is a brief research review. From these references it can be said that as many leading companies maintain their own pro-sports team, they maximize the value of themselves and their products, because direct and indirect far-reaching effects of pro-sports are tremendous through mass communication such as TV, newspaper, etc. Without the interest in pro-sports industry management any company would fall behind in worldwide severe industrial competition.

<Table 1> A review of the relationship between sports and business companies

Classification	Studies
Relationship between sports team and advertisement	[9], [11]
Company publicity through sports	[1], [4]
Company PR	[5], [14]
Sports sponsorship	[8], [12], [6], [13]
Sports agent	[10], [7]
Customer/fan loyalty	[2], [3]

We studied relations between variables related to fan's preference in an area of pro-baseball which is the most popular among pro-sports in Korea. The dependent variables are pro-baseball team fan's preference for both the team and the products of the company, owner of the pro-baseball team, while the independent variables are individual characteristics of fans(/customers). The uni-dimensional independent variable study was done in [3], while in

this paper the two-dimensional independent variables study is presented. Since this study is an extension of the previous study[3], we use the same data, questionnaire, and subjects as those used in [3]. From the two-dimensional independent study rather than the one-dimensional we become to have the segmented fans subsets instead of whole sets, so that we can concentrate our management effort and budget on smaller subsets and improve the effectiveness. From the analysis of those relations between variables we can obtain important implicated meanings about management of pro-sports teams and fans and fans preference to products, where whole fans consist of the fans subset segmented by fans characteristics such as sex, age, income, etc. In the previous study[3], hypotheses were constructed with those variables, for testing them a questionnaire was used, whose reliability was checked using Kronbach Alpha, and the subjects were 314 college students in a local city. The concrete explanation was not replicated and given here. For that, please refer to the previous study[3].

2. Fans' loyalty and its factors

From the review of references we know that there are too many variables showing fans' loyalty and its influencing factors. In this study we are interested in a few important variables within our possible research limit as follows. Fans' loyalty is revealed in several forms : first, people as spectators directly watch games in sports grounds; secondly, they indirectly teleview games through TV, etc.; thirdly, they buy newspapers and magazines for reading pro-baseball sport articles; and fourthly, they purchase products produced by the company related to the pro-sports in which people are interested.

Thus, the fans' loyalty was measured by sub-variables d1 to d8 as follows : the number of times of visiting sports grounds for direct watching of games (let's call it d1), the amount of time in years for direct watching of games in sports grounds in their life(let's call it d2), the number of membership participation in baseball clubs(let's call it d3), the amount of hours per week for indirectly televiewing of games on TV(let's call it d4), the degree of their buying newspapers and magazines for reading pro-baseball sport articles(let's call it d5), the number of home electronic products produced by the company related to the pro-baseball team you like(let's call it d6), the number of times per week of drinking the alcoholic liquors/drinking water produced by the company related to the pro-baseball team they like(let's call it d7), and the degree of intent to buy in the future products produced by the company related to the pro-sports in which they are interested(let's call it d8)(Table 2). These sub-variables d1 to d8 were measured in five-point scales.

When we combine a few variables from those eight sub-variables, as result we get the interested variables. That is, the combination of d1 to d3 leads to direct participation(let's call it y1; we calculate y1=(d1+d2+d3)/3), which means that fans directly participate in pro-sports; the combination of d4 and d5 leads to indirect participation(let's call it y2; we calculate y2=(d4+d5)/2)), which means that fans indirectly participate in pro-sports; the combination of d6 to d8 is product support in the number(simply, say product support, and let's call it y3; we calculate y3=(d6+d7+d8)/3)), which means the degree that fans purchase the products produced by the company related to the pro-baseball team they like. It can be confirmed in [3] that regarding these variables, reliability was checked using Kronbach Alpha and there was no problem.

<Table 2> Dependent variables and its subvariables

Variables	Subvariables
(y1)	the number of times of visiting sports ground for direct watching of games(d1)
	the amount of times in years for direct watching games in sports grounds in their life(d2)
	the number of membership participation in baseball clubs(d3)
(y2)	the amount of hours for indirect televiewing games on TV(d4)
	the degree of their buying newspapers and magazines for reading pro-baseball sport articles(d5)
(y3)	the number of home electronic products produced by the company related to the pro-baseball team you like(d6)
	the number of times per week of drinking the alcoholic liquors/drinking water produced by the company related to the pro-baseball team you like(d7)
	the degree of intent to buy, in the future, products produced by the company related to the pro-sports in which they are interested(d8).

On the other hand, as the factors influencing fans' loyalty we used sex, age, income, and hometown, where income means a monthly pocket money since our subjects sampled are not employed but simple students. Age was divided into two categories, where the category 1 consists of 20-24 years old persons while the category 2 consists of 25-29 years old persons. Income was divided into 5 categories, where the categories 1, 2, 3, 4 and 5 are 0-50,000 Won, 50,001-100,000 Won, 100,001-150,000 Won, 150,001-200,000 Won, and 200,000- ∞ Won, respectively. Hometown was divided into eight categories, i.e. Seoul, Gyunggido, Gangwondo, ... , and Jejoodo. Each frequency table is given in [3]. These variables are independent variable. Because we are concerned with the two-dimensional independent variables effects on dependent variables and there are four independent variables, there are six two-dimensional combinations of independent variables.

3. Two-dimensional effects of sex, age, income, and hometown on fans' loyalty

Because the independent variables are fan's sex, age, income, and hometown, two-dimensional combinations of independent variables are age*sex, income*sex, hometown*sex, income*age, hometown*age, and hometown*income. We used two-way analysis of variance in order to investigate whether two-dimensional combination, age*sex, income*sex, hometown*sex, income*age, hometown*age, and hometown*income affect fans' loyalty. Used software is SPSS 10.0. In the two-dimensional analysis dependent variables were three variables y1, y2, and y3 in this study, that is, direct participation(y1), indirect participation(y2), and product support(y3).

In the analysis of variance application we evaluated the significance level of equal variance null hypothesis test for checking the validity of analysis of variance usage. We found out six significant two-dimensional effects and the result is shown in Table 3. Among them, two effects were obtained under the rejection of equal variance null hypothesis, and so their interpretation should be conservative(Table 3).

Thus, the six significant two-dimensional effects on loyalty are stated as follows.

Age*sex influences fans' direct participation(y1) and product support(y3); Age*income influences fans' direct/indirect participation(y1, y2) and product support(y3); Age*hometown influences fans' indirect participation(y2). Using these results, we can segment smaller subgroup of fans and decide the more effective target of fans management.

<Table 3> Two-dimensional effects(p-values) on loyalty

2-dimensional combinations	Direct participation	Indirect participation	Product support
Age* sex	0.014*(A)		0.000**(R)
Sex* income			
Sex* hometown			
Age* income	0.042*(A)	0.028*(A)	0.04*(R)
Age* hometown		0.072 ▽(A)	
Hometown* income			

** : p<0.01; * : p<0.05; ▽ : p<0.1; empty boxes mean 'not significant'; (A) means the equal variance hypothesis is accepted while (R) means it is rejected.

4. Identification of the best fans and the worst fans using contingency tables

Let us suppose that each significant relation in two-dimensional combinations has X and Y axes. Then we have six contingency tables with X and Y axes(Tables 4-9), where in the box with the highest loyalty mean score there are best fans(designated with *), say, while in the box with the lowest loyalty mean score there are worst fans(designated with △), say. However, in case the frequency number is small like 1 or 3, we ignored that box and looked for other box which did not have such a small frequency number, then we determined both best fans box and worst fans box.

From those best and worst fans boxes, strategic suggestions for fans management can be given as follows.

(1) 20-24 years old and female persons are loyal fans in terms of direct participation(Table 4).

<Table 4> Age*sex contingency table(direct participation): p<0.05

Age (X)	Sex (Y)	Mean	Standard deviation	Frequency	Subtotal	Total
20-24	Male	2.7101	1.0477	69	152	314
	Female	2.7149 *	1.0721	83		
25-29	Male	2.5556	1.1052	87	162	
	Female	1.9556 △	1.0757	75		

* : best fans box; △ : worst fans box

<Table 5> Age*sex contingency table(product support): p<0.01 Equal variance hypothesis rejected

Age (X)	Sex (Y)	Mean	Standard deviation	Frequency	Subtotal	Total
20-24	Male	2.6377	0.9195	69	152	314
	Female	2.8514 *	0.9417	83		
25-29	Male	2.7203	0.7132	87	162	
	Female	2.1778 △	0.7089	75		

* : best fans box; △ : worst fans box

(2) 25-29 years old and female persons are worst fans in terms of direct participation and some special promotion activity is necessary for them(Table 4).

(3) 20-24 years old and female persons are loyal fans in terms of product support(Table 5).

(4) 25-29 years old and female persons are worst fans in terms of product support and some special promotion activity is necessary for them(Table 5).

(5) 20-24 years old and 150,001-200,000 Won category persons are loyal fans in terms of direct participation(Table 6).

(6) 25-29 years old and 150,001-200,000 Won category persons are worst fans in terms of direct participation and some special promotion activity is necessary for them(Table 6).

(7) 20-24 years old and 150,001-200,000 Won category persons are loyal fans in terms of indirect participation(Table 7).

(8) 25-29 years old and 50,001-100,000 Won category persons are worst fans in terms of indirect participation and some special promotion activity is necessary for them(Table 7).

<Table 6> Age*income contingency table(direct participation): p<0.05

Age (X)	Income (Y)	Mean	Standard deviation	Frequency	Subtotal	Total
20-24	0-50000	3.6667	.	1(*)	152	314
	50001-100000	1.1111	.1925	3(△)		
	100001-150000	2.4444	.8698	15		
	150001-200000	2.8725*	.9710	34		
	200001-	2.7374	1.0903	99		
25-29	0-50000	1.7778	.9623	3	162	
	50001-100000	2.0417	1.2528	8		
	100001-150000	2.4095	1.0999	35		
	150001-200000	2.0133 △	1.0410	50		
	200001-	2.4596	1.1807	66		

* : best fans box; △ : worst fans box ( ) : too small

<Table 7> Age*income contingency table(indirect participation): p<0.05

Age (X)	Income (Y)	Mean	Standard deviation	Frequency	Subtotal	Total
20-24	0-50000	4.0000	.	1(*)	152	314
	50001-100000	1.3333	.5774	3(△)		
	100001-150000	3.3667	.8550	15		
	150001-200000	3.4118*	.7927	34		
	200001-	3.1212	1.0304	99		
25-29	0-50000	2.3333	.2887	3	162	
	50001-100000	2.5000 △	1.1952	8		
	100001-150000	2.9429	.9454	35		
	150001-200000	2.7400	.9161	50		
	200001-	3.0379	1.1208	66		

* : best fans box; △ : worst fans box; ( ) : too small

(9) 20-24 years old and 150,001-200,000 Won category persons are loyal fans in terms of product support(Table 8).

<Table 8> Age*income contingency table (product support); p<0.05

Age (X)	Income (Y)	Mean	Standard deviation	Frequency	Subtotal	Total
20-24	0-50000	3.6667	.	1(*)	152	314
	50001-100000	1.1111	.1925	3(△)		
	100001-150000	2.6444	.7397	15		
	150001-200000	3.0000*	.8449	34		
	200001-	2.7273	.9552	99		
25-29	0-50000	2.2222	.3849	3	162	
	50001-100000	1.8750 △	.7113	8		
	100001-150000	2.6571	.5744	35		
	150001-200000	2.3733	.7051	50		
	200001-	2.5253	.8634	66		

* : best fans box; △ : worst fans box; ( ) : too small

<Table 9> Age*hometown contingency table(indirect participation); p<0.1

Age (X)	Hometown (Y)	Mean	Standard deviation	Frequency	Sub total	Total
20-24	Seoul	3.0577	1.1099	52	152	314
	Gyunggi	3.0000	.9075	18		
	Incheon	3.4375*	.7289	8		
	Choong cheong	3.4219	.9928	32		
	Jeonra	3.1957	.7648	23		
	Gyungsang	3.2500	1.1051	14		
	Gangwon	3.3750	.4787	4		
	Jejoo	1.0000	.	1(△)		
25-29	Seoul	2.8824	1.0029	51	162	
	Gyunggi	3.2692	.8394	26		
	Incheon	2.5000	1.0408	7		
	Choong cheong	2.9306	1.0362	36		
	Jeonra	2.8269	.9481	26		
	Gyungsang	2.1250△	1.0938	8		
	Gangwon	2.7000	1.4405	5		
	Jejoo	2.8333	1.8930	3		

* : best fans box; △ : worst fans box; ( ) : too small

(10) 25-29 years old and 50,001-100,000 Won category persons are worst fans in terms of product support and some special promotion activity is necessary for them(Table 8).

(11) 20-24 years old and 3rd hometown category(Incheon) persons are loyal fans in terms of indirect participation(Table 9).

(12) 25-29 years old and 6th hometown category (Gyungsang) persons are worst fans in terms of indirect participation, and some special promotion activity is necessary for them(Table 9).

5. Conclusion

In this paper we identified what fans are loyal to pro-baseball and the products produced by the companies related to the pro-baseball. Thus, such fans' age, sex, income, and hometown were two-dimensionally shown. In addition we identified worst fans who are not loyal. Loyalty was measured by the three variables, direct participation(y1), indirect participation(y2), and product support(y3). These variables have three, two, and three sub-variables, respectively.

The two-way analysis of variance method was used, and so two-dimensional effects of age, sex, income, and hometown variables on loyalty were analyzed. Then we found out six statistically significant results. It is suggested that loyal fans should be contacted with normal reinforcement such as adequate compensation and continuous information notice while worst fans should be managed with positive reinforcement such as effective incentives, promotion and active PR. In the case that equal variance hypothesis is rejected, we need to interpret the result more conservatively even if it is statistically significant.

It can be said that in next study we need to add more factors influencing loyalty, to increase the number of subjects, to consider other age categories, and to study three-dimensional combination of independent variables.

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