

## Determinant factors and satisfaction of spectators at the selecting national table tennis team competition in Taiwan

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**Abstract:** The purpose was to investigate determinant factors and satisfaction of spectators. 314 participants were selected from spectators who were attending 2010 selecting national table tennis team competition in Taiwan. Table tennis spectator attendance scale (TTSAS) was used. Descriptive statistic, repeated measures ANOVA, Bonferroni multiple comparison and canonical correlation were used in the data analysis. The results were: (1) attraction of game was the top rated factor followed by facilities and environment, personal factors, and media promotion. Finance was the lowest rated factor. (2) Satisfaction of spectators indicated that attraction of game was the top rated factor followed by facilities and environment, expertise and promotion. (3) Determinant factors of spectators were significantly correlated with satisfaction of spectators. Suggestions were as follow: (1) attraction of game, personal factors, facility and environment, promotion were important determinant factors of spectator attendance. (2) Satisfaction of spectators needs to pay attention on attraction of game, facilities comfortable and convenience, expertise and promotion to increase spectators' participation. (3) The findings should be taken into consideration in developing strategies for national table tennis association in Taiwan; and (4) there is a need for further study on table tennis spectators.

**Keywords:** determinant factors, satisfaction, spectators

### 1. INTRODUCTION

In today society, people are paying more attention on leisure activities because of stress from daily life and leisure time increase. Sport spectating represents a predominant form of leisure behavior [22, 2, 11]. Spectators could reduce stress and get entertainment from sport event so it could relax body and mind [10]. Spectator sport also increase social integration and culture experience. Kao [11] pointed out that sport spectators were benefits to individuals from three aspects: (1) balancing life experience; (2) developing the meaning of life; (3) improving quality of life. Therefore, attending sport events not only could gain entertainment, relieve emotion, and increase sport knowledge, but also interact with others to receive group identification and develop interpersonal relationship.

Spectators play an important role for player's performance in sport event. Kelly [12] mentioned that the players are motivated by enthusiasm of the watchers. Chang et al. [3] also pointed out that spectating rates would influence player's performance. Moreover, sport development could benefit from spectators' support [4]. Hence, spectators were a very significant element to fulfill a successful competition in sports.

In sport industry, spectator also plays an important role [13]. In USA, watchers spent around 17.1 billion dollars a year on ticket [21]. 11 billion dollars were bought on Korea professional soccer K union ticket and Japan spectators spent 35 billion dollars on ticket [31]. Taiwan spent 19 millions dollars on Chinese Taipei baseball ticket [17]. There are big business opportunities from sport spectators.

It would be useful to understand the factors that affect people to attend sporting events [14]. However, it is a challenge for researchers and practitioners to understand the factors that motive people to watch sport [1]. Most

of research today emphasized on psychological needs and motivations to drive spectators watch a particular sport. Some studies have focused on the behavior or the factors of sport spectators relative to their identification with a particular team [28, 29, 30]. McDonald et al. [18] indicated that much of empirical research in sport marketing does not address many critical questions of interesting sport organization, such as what factors can be used to explain and predict spectator participation. Therefore, this study examined those factors in order to understand determinant factors of spectator attendance.

Satisfaction has been viewed as an important predictor to attend future sporting events in spectator sports [16]. Kotler [15] indicated that the way to attract more sport spectators was to increase satisfaction of spectator. Thus, this study would also identify satisfaction of spectators.

McDonald et al. [18] noted that factors of attract people watching sport event would be affected from different situation and different sports. Thus, this study was concentrated on one particular sport—table tennis rather than to sport in general. The reason to choose table tennis was because the author was a former table tennis player. Moreover, Chinese Taipei national table tennis team's performance has been very well in international competition recently. It should attract spectators to participate the game but it was only a few audiences attending table tennis tournaments in stadium. The table tennis association has been faced the challenge of attraction of spectator attendance. However, the fundamental to increase spectating rates is to understanding spectator [19]. Unfortunately, there was very little information on the determinant factors and satisfaction of spectator attendance at table tennis competition. Hence, the purpose was to identify the determinant factors and satisfaction of spectator attendance at the selecting national table tennis team

competition. Results were hoping to provide information for national table tennis association and providers of table tennis events to develop strategies and increase spectator attendance.

## 2. PURPOSES

- (1) The first purpose was to identify determinant factors of spectators.
- (2) The second purpose was to understand satisfaction of spectators.
- (3) The third purpose was to analyze the relationship between determinant factors and satisfaction of spectators.

## 3. METHOD

### 3.1 Sample

The participants were 314 spectators, who attended the national table tennis tournament from Dec. 24 to 27, 2010. Male participants comprised 64.6 % (N = 203) and females 35.4 % (N = 111). The participants' age was below 20 years old (31.8%), 21-30 years old (27.4%), 31-50 year old (24.8%) and above 50 years old (16%). The participants' marital status was married 46.7% and single 53.3 %. The educational level of participants had obtained college degree 69.7%, 24.2% had obtained a high school degree, 3.8% had obtained a junior-high degree and only 2.3% had graduate school degree. The per month income of participants was reported as 46.5% of the sample income below N.T. \$ 10,000 (= U.S. \$350, 21.3% of the sample income from N.T. \$20,000 to N.T. \$40, 000, and 32.2% of sample income above N.T. \$40,000. The participants' occupation was: student (51.6%), public service (15.3%), businessman (13.1%), worker (1.9%), others (18.1%). There were 26.5% of spectators to get the information of table tennis competition from newspaper, 10.5% from electric media, 10.5% from internet, and 52.5% from others.

### 3.2 Instrument

Table tennis spectator attendance scale (TTSAS) was revised from Huang [8, 10]. There were three parts in the questionnaire which were determinant factors, satisfaction and demographics of spectators. The initial instrument contained 32 questions on determinant factors, 17 questions on satisfaction and 6 questions on background. Three experts who represented academy in sport management from Taiwan were asked to review the questionnaire.

The final questionnaire was consisted 32 questions on determinant factors which were divided into 6 factors: attraction of game (5 items), facilities and environment (3 items), finance (3 items), media promotion (6 items), and personal factors (14 items). Satisfaction was included 17 questions which were divided into 3 factors: attraction of game (6 items), facilities comfortable and convenience (5 items), expertise and promotion (6 items). A 5-point Likert was used as the rating scale.

The internal consistency of the determinant factors scale was calculated using Cronbach coefficients: "attraction of game"  $\alpha = 0.94$ , "facility and convenience"  $\alpha = 0.83$ , "finance"  $\alpha = 0.83$ , "media promotion"  $\alpha = 0.91$ , "personal factor"  $\alpha = 0.81$ . The internal consistency of satisfaction scale was calculated using Cronbach coefficients: "attraction of game"  $\alpha = 0.86$ , "facilities and convenience"  $\alpha = 0.81$ , "expertise and promotion"  $\alpha = 0.81$ .

## 4. DATA ANALYSES

Descriptive statistics, repeated measures ANOVA and Bonferroni multiple comparisons were used to analyze determinant factors and satisfaction of spectators' attendance at the game. The relationship between determinant factors and satisfaction was used canonical correlation to analyze the result.

## 5. RESULTS AND DISCUSSION

### 5.1 Determinant factors of spectator attendance

Descriptive statistics were used to examine determinant factors of spectator attendance (Table 1, 2). The factors were exhibited from the highest to the lowest mean ranked. The findings indicated that "attraction of game" (M  $\pm$  SD) (4.20  $\pm$  0.66) was the top rated factors followed by "facility and convenience" (4.05  $\pm$  0.50), "personal factors" (3.96  $\pm$  0.44), and "media promotion" (3.69  $\pm$  0.75). "Finance" was the lowest rated factor (3.41  $\pm$  0.54).

From the results, there was no surprise that the "attraction of game" was the top determinant factor of spectator attendance. It corresponded with prior research which stated that "attraction of game" was an extremely important factor for spectators [27, 24, 10]. Moreover, researches stated that exciting game can reinforce pleasures and enjoyment which could attract individuals to attending sport events [7, 22]. However, "finance" was the lowest score of determinant factor, it could be because "appreciation of the aesthetic quality of the event loaded highly from the motive set" [22]. Therefore, spectators seem more concerned on aesthetic quality of the contest and the experience of drama in the game than the "finance", such as the ticket price.

The repeated measure ANOVA indicated that there was a significant difference among "attraction of game", "facility and convenience", "personal factors", "media promotion" and "finance" of determinant factors. The Bonferroni multiple comparison to compare 5 determinant factors showed that "attraction of game" was higher than "facility and convenience", "personal factors", "media promotion" and "finance" of determinant factors; "facility and convenience" was higher than "media promotion" and "finance" of determinant factors; "personal factors" was higher than "facility and convenience", "media promotion" and "finance"; and "media promotion" was higher than "finance".

Table 1 Descriptive statistics of determinant factors

Determinant factors	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>Post hoc</i>
Attraction of game (1)	314	4.20	.66	130.59*	(1) > (2) (3) (4)(5)
Facility and environment (2)	314	4.05	.50		(2) > (4)(5)
Personal factors (3)	314	3.96	.44		(3) > (2)(4)(5),
Media promotion (4)	314	3.69	.75		(4) > (5)
Finance (5)	314	3.41	.54		

Table 2 Descriptive statistics of determinant factors

Determinant factors	<i>M</i>	<i>SD</i>
Attraction of game		
1. Excitement	4.09	1.06
2. competition level	4.14	.77
3. players' spirit	4.28	.78
4. game attraction	4.28	.74
Facility and convenience		
5. utilities	4.06	.67
6. transportation convenience	4.12	.69
7. seating space	4.00	.65
8. clean restroom	3.97	.72
9. clear view	4.22	.59
10. appropriate facilities	4.11	.67
11. sufficient parking space	3.97	.75
12. location	3.96	.79
Personal factors		
13. enjoyment	4.12	.70
14. entertainment	3.96	.90
15. escape	3.70	1.02
16. favorite team	3.91	1.03
17. favorite player	4.24	.68
18. experience victory	3.93	.73
19. family or friends go together	3.80	.95
20. leisure activity	4.04	.66
21. interaction with people	3.95	.78
22. sufficient leisure time	3.97	.73
Media promotion		
23. radio	3.69	.96
24. TV	3.73	.99
25. advisement	3.64	.95
26. newspaper	3.75	.91
27. internet	3.52	.99
28. broadcasting	3.83	.96
Finance		
29. need to buy ticket, I won't go	2.82	1.04
30. whether or not to pay	3.55	1.05
31. budget	3.52	.99
32. exciting game, willing to buy ticket	3.86	1.00

## 5.2 Satisfaction of spectator attendance

Descriptive statistics were used to examine determinant factors of spectator attendance (Table 3, 4). The findings showed that "attraction of game" ( $4.19 \pm 0.88$ ) was the top rated factors followed by "facility and convenience" ( $4.02 \pm 0.56$ ). "Expertise and promotion" was the lowest rated factor ( $3.80 \pm 0.61$ ).

The result of satisfaction of spectators indicated that the "attraction of game" was the top satisfaction of spectator attendance. Yoshida and Jame [32] mentioned that creating an exciting game atmosphere will satisfy attendees, and positively influence spectators returning for future events. Thus, sport spectators were more concerned on pleasure, enjoyment and experience of psychological feeling on the game so it is very important to attract people to experience exciting games and willing to watch games again. However, expertise and promotion had the lowest score of satisfaction. De Schriver and Jensen [5] mentioned that there was a positive correlation between promotion and spectator attendance. Parkhouse [20] also noted that promotion would increase people attention on sport event. However, Huang [9] addressed that the information of table tennis events in Taiwan was not easy to get so people didn't know information of the contests in order to participate the game. Thus, providers of table tennis events need to pay more attention on promotion.

Repeated measure ANOVA exhibited that there was a significant difference among "attraction of game", "facility and convenience", and "expertise and promotion" of satisfaction. The Bonferroni multiple comparison to compare 3 factors of satisfaction indicated that "attraction of game" was higher than "facility and convenience"; "expertise and promotion" and "facility and convenience" was higher than "expertise and promotion".

Table 3 Descriptive statistics of satisfaction

Satisfaction	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>Post hoc</i>
Attraction of game (1)	314	4.19	.88	130.59*	(1) > (2) (3) (2) > (3)
Facility and convenience (2)	314	4.02	.56		
Expertise and promotion (3)	314	3.80	.61		

Table 4 Descriptive Statistics of Satisfaction

Satisfaction	<i>M</i>	<i>SD</i>
Attraction of game		
1. excitement	4.21	.63
2. players' skills performance	4.27	.62
3. entertainment	4.27	4.06
4. relaxation	3.84	.80
5. game attraction	4.32	.58
6. players' spirit	4.24	.72
Facility and convenience		
7. comfortable seating	3.65	.98
8. facilities	3.87	.81
9. transportation convenience	4.08	.74
10. clean restroom	4.28	4.07
11. sufficient parking space	4.22	3.22
Expertise and promotion		
12. empire	4.02	.76
13. reporter	3.80	.92
14. pre-game promotion	3.23	1.11
15. media promotion	3.18	1.01
16. electronic media promotion	3.20	1.10

### 5.3 The relationship between determinant factors and satisfaction

There was a positive correlation between determinant factors and satisfaction of spectators' attendance ( $r = 0.552$ ,  $p < 0.01$ ). In Table 5, the simple correlations among the determinant variables ranged from 0.18 to 0.63 and the correlations among the satisfaction variables ranged from 0.29 to 0.75; the result also indicated that the correlations among the determinant factors and satisfaction ranged from 0.16 to 0.95. The highest correlation of determinant factors was between "personal factor" and "media promotion" ( $r = 0.63$ ,  $p < 0.01$ ). In the satisfaction, the highest correlation was "attraction of game" and "facility and convenience" ( $r = 0.75$ ,  $p < 0.01$ ). The factor between "media promotion" and "expertise and promotion" was the highest correlation of determinant variables and satisfaction ( $r = 0.95$ ,  $p < 0.01$ ). Therefore, those who had a higher score in "personal factor" of determinant factors often had faced influence by "media promotion" of determinant factors; and those who had a higher score in "game attraction" of satisfaction often had influenced by "facility and convenience" of satisfaction. Moreover, those who had a higher score in "media promotion" of determinant factors often had influenced by "expertise and promotion" of satisfaction.

However, the lowest correlations were between "attraction of game" and "media promotion" in determinant variables ( $r = 0.18$ ,  $p < 0.01$ ), "attraction of game" in determinant variables and "attraction of game" in satisfaction ( $r = 0.16$ ,  $p < 0.01$ ), and "attraction of game" in determinant variables and "facility and convenience" in satisfaction ( $r = 0.16$ ,  $p < 0.01$ ).

According to the Pearson correlation, determinant factors and satisfaction was positively correlated. It corresponded with prior research which stated that spectators participated in game more would satisfy more

on the game [26, 10]. Therefore, providers of table tennis event need to understand why spectators willing to participate the game in order to satisfy their needs and to motivate them enthusiastically come back again.

Table 5 Correlations between determinant factors and satisfaction

Factors	X1	X2	X3	X4	X5	Y1	Y2	Y3
X1 Attraction of game	1.00							
X2 Facility and convenience	.30*	1.00						
X3 Personal factor	.40*	.56*	1.00					
X4 Media promotion	.18*	.42*	.63*	1.00				
X5 Finance	.25*	.24*	.32*	.26*	1.00			
Y1 Attraction of game	.16*	.27*	.44*	.30*	.22*	1.00		
Y2 Facility and convenience	.16*	.29*	.33*	.25*	.19*	.75*	1.00	
Y3 Expertise and promotion	.27*	.47*	.69*	.95*	.26*	.33*	.29*	1.00

\*  $p < 0.05$

As shown in table 6, the three canonical correlations reached the significant level ( $\rho_1 = 0.96$ ,  $\rho_2 = 0.32$ ,  $\rho_3 = 0.17$ ). The first canonical correlation of determinant variables and satisfaction variables were 0.96. The correlations between determinant factors and correlation variable  $\chi_1$  were -0.29, -0.49, -0.72, 0.99, and -0.27 respectively. The correlations between determinant factors and correlation variable  $\eta_1$  were -0.35, -0.29, and -1.00 respectively. Approximately 91% of the first canonical factor ( $\chi_1$ ) of X variables could explain the first canonical factor ( $\eta_1$ ), and approximately 40.3% of the first canonical factor ( $\eta_1$ ) could explain the total Y variables. The first canonical factor of Y variables and X variables in the overlap coefficient was 36.9%. Therefore, through the first pair of canonical factor ( $\chi_1$  and  $\eta_1$ ), approximately 36.9% of X variables could explain the total Y variables. Moreover, the overlap coefficient of Y variable and X variable was 34.7%. Y variable through the first pair of canonical factor ( $\eta_1$  and  $\chi_1$ ) could explain approximately 34.7% of X variable.

Among the X variables, the factor accumulated score of "media promotion" in the determinant factors of spectator attendance is highly related to the first canonical factor ( $\chi_1$ ) with a canonical weight 0.99. Among the Y variables, the factor accumulated score of "expertise and promotion" in the satisfaction of spectator attendance is highly related to  $\eta_1$  with a canonical weight 1.00 (Table 6).

From the results, the simple correlation indicated those who had a higher score in "media promotion" of determinant factors often had influenced by "expertise and promotion" of satisfaction. Also, based on the result of canonical correlation from determinant factors and

satisfaction variables correlation value test, “media promotion” was the factor which affected the total variable of determinant factors most. Thus, improving determinant factors of “media promotion” could be the most helpful in gaining the best result for spectator attendance. Funk and James [6] stated that media promotion plays an important role to attract spectator attendance. Robinson et al. [23] also mentioned using website to interact with spectators, providing discussion section and information of contests in order to attract spectators’ attention. Su [25] stated that providing a lot of information and pictures through newspaper and magazine to interest different group of spectators and fans. He further indicated that through television broadcasting, people would have opportunity to involve in sports. Wann and Branscombe [28] also pointed out that if spectators read many sport related newspaper and magazine and frequently discuss with anyone, they would watch and participate more on sport competitions. Therefore, provider of table tennis competition and Chinese Taipei table tennis association need to pay attention on promotion and maintain good public relation with media in order to have more opportunities to show up on TV and newspaper.

Table 6 Canonical correlation analysis for determinant factors and satisfaction

Determinant factors	Canonical variable			Satisfaction	Canonical variable		
	$\gamma_1$	$\gamma_2$	$\gamma_3$		Y	$\eta_1$	$\eta_2$
X1 Attraction of game	-.29	.19	.37	Y1 Attraction of game	-.35	.93	.07
X2 Facility and environment	-.49	.34	.74	Y2 Facility and convenience	-.29	.64	.72
X3 Personal factors	-.72	.66	-.06	Y3 expertise and promotion	-1.00	-.02	.02
X4 Media promotion	.99	-.11	-.04				
X5 Finance	-.27	.43	.24				
Extracts the variance %	38.0	15.5	14.8	Extracts the variance %	40.3	42.5	17.2
Overlap coefficient %	34.7	1.6	0.4	Overlap coefficient %	36.9	4.3	0.5
$\rho$	.96*	.32*	.17*				
$\rho^2$	.91	.10	.03				

\*  $p < 0.05$

## 6. CONCLUSIONS AND SUGGESTIONS

### 6.1 Conclusions

Spectators play a significant part in sport events. Having spectators’ support would motivate the players’ enthusiasm on games. Thus, how to promote spectators attendance is a major issue on hosting table tennis competitions. Determinant factors and satisfaction were important indicators to understand spectators. The results indicated that attraction of game of determinant factors was the top rated factors followed by facility and

environment, personal factors, promotion and finance. Therefore, attraction of game, facility and environment, personal factor, media promotion, and finance were the determinant factors for spectator attendance. Therefore, through star players, home and away game, city sponsor team, high skill performance, media and marketing promotion, high quality of facility and convenience location, it would encourage spectator to participate the sport game.

Also, the findings of satisfaction demonstrated that attraction of game was the top rated factors followed by facility and convenience. Expertise and promotion was the lowest satisfaction rated factor. Thus, national table tennis association and table tennis event providers in Taiwan need to take promotion into consideration as a necessary strategy to hold table tennis event. Table tennis event could use through establishing website, holding table tennis activities (e.g. taking pictures with star players), increasing table tennis event souvenir (e.g. T-shirt, key chain, star card), poster and flag to attract spectators’ attention.

In the simple correlation, there was a positive correlation between determinant factors and satisfaction of spectators’ attendance. Moreover, the highest correlation of determinant factors was “personal factor” and “media promotion”; the highest correlation of satisfaction was “attraction of game” and “facility and convenience”. The factor between “media promotion” and “expertise and promotion” was the highest correlation of determinant variables and satisfaction. In the canonical correlation, there was a canonical correlation coefficient, which was “media promotion”, reaching a significant level.

### 6.2 Suggestions for future research

Understanding spectators’ behavior is fundamental to increase spectating rates. Thus, the results of this study could be a useful resource to the table tennis association and the provider of table tennis contests to understand the spectators in order to attract people attending table tennis games. However, this study only used the selecting national table tennis competition spectators as sample so future research should continue to duplicate the study within different competitions, different levels of competition and different culture. Furthermore, spectators who were not attended games also need to be surveyed in order to gain a better understanding of the underlying determinant factors of those who might not attend games. Moreover, this study only concentrated on determinant factors and satisfaction so it is suggested future research to investigate other factors, such as demographics, level of involving, prohibit factors. In addition, participation and spectating are often intertwined. Future research is needed to better understand the connection between participation and spectating in order to predict or attract people to involve in sports.

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