

# Factor Analysis of Safety for Visitors to a Mega-Event

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This paper investigated the safety factors considered by visitors to the Kwangju Biennale 2000 and analyzed the correlation between the safety factors and the demographic characteristics of the visitors. Global tourism increased throughout the 1990s, with the biggest surge occurring in the Asia-Pacific region. Long-distance travel is also increasing, and at a rate faster than the global average. The opportunities for event tourism appear to be strong almost everywhere, even though recessions may have an impact on these destinations. Along with this upward trend, competition for more desirable tourists is also surging (Getz, 1997). Therefore event tourism is appearing as a powerful method in the fierce competition around the tourism industry.

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factor analysis   safety   mega-event   event tourism

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## 1. INTRODUCTION

As the economic benefits of event tourism, a number of mega-events can reduce tourism outflow from the host country by as much as half, increase inflow by a similar proportion, and eventually generate tourist expenditure (Vanhove & Witt, 1987). In accordance with this viewpoint, mega-events

like Kwangju Biennale 2000 have been held frequently in Korea since 1991, when the local government system started.

The main roles of an event like that are to enhance the image of communities and attract tourists (Kotler, Haider, & Rein, 1993), to strengthen destination attractiveness as “drawing power” (Mill & Morrison, 1985), and so on. Focused on the image of a destination, research (Sirakaya, Sheppard, & McLellan, 1997) about the effect of perceived safety at a potential vacation destination showed that destination marketers, travel agents, and hospitality industry members should be concerned with improving their image when such image is negative with regard to safety. An economic loss from accidents caused by ignoring safety can be classified as direct cost and indirect (hidden) cost. The original Heinrich’s research resulting in the 4-to-1 ratio for indirect to direct costs was made in 1926 (Heinrich, Peterson, & Roos, 1980).

Event industry in Korea does not seriously recognize the importance of safety management against accidents known to tarnish the image of a destination. Moreover few safety standards or studies for event industry can be found.

Therefore, the purpose of this study is to examine the safety factors considered by visitors to the Kwangju Biennale 2000 in Korea and to analyze the correlation between the safety factors and the demographic characteristics of the visitors. About 600 thousand people visited this mega-event, the biggest art event in Asia, which was held in the city of Kwangju in the Cholla province for 71 days (March 29–June 6, 2000) and in which some 250 artists from 46 countries participated.

## 2. LITERATURE REVIEW

Safety can be defined as any device for preventing an accident (Webster’s New World Dictionary, 1984) and freedom from the occurrence or risk of injury, or loss (Random House Dictionary of the English Language, 1987). Kwon (1999) describes safety as a state that is free from an accident. According to Heinrich, an accident causing an injury is in turn invariably caused directly by an unsafe act of a person or a mechanical or physical hazard (Heinrich et al., 1980). These studies reasonably lead to the conclusion that an accident is a major factor of safety.

The Occupational Safety and Health Administration (OSHA) in the U.S. Department of Labor promulgated occupational safety and health standards for general industry except for tourism-related industry (OSHA, 1989). In the case of the commercial diving industry, the standards include a diving

safety manual, procedures covering all diving operations, procedures for emergency care, criteria for diver training and certification. Various factors influencing accidents were studied in a few studies (e.g., Leonard, 1999; Lichtenstein, Slovic, Fischhoff, Combs, & Layman, 1978). Especially Leonard (1999) insisted that a primary function of warnings and instructions that provide safety information is to modify the behavior of the recipients to avoid or at least mitigate the hazard.

It is acknowledged that, within tourism studies, tourism researchers have generated very little research about tourists' safety, which is usually related to the image of a destination (e.g., Clift & Page, 1996; Page, Clift, & Clark, 1994), tourist behavior (e.g., Bewes, 1993; Cossar, 1995; Cossar et al., 1990; Johnston, 1989; Kwon & Park, 1998; Sirakaya et al., 1997), tourists' death abroad (e.g., Paxiao, Dewar, Cossar, Covell, & Reid, 1991), safety factors (Pinhey & Iverson, 1994), traveler choice models (Zins, 1998), and a safety checklist in a restaurant (Stokes, 1982).

Recently two studies analyzed safety factors of concern to people visiting the '99 Hanam International Environmental Exposition (Park, 2000b) or the '99 Kangwon International Travel Exposition (Kwon & Park, 2000a) in Korea. The results of the former study (Park, 2000a) are as follows:

1. The male group was significantly more satisfied with all factors (Safety facility, Hygiene status, Emergency facility, Disabled- and elderly people-related facility, Overall satisfaction) than the female group.
2. The less educated the visitors, the more satisfied they are with safety factors (Safety facility, Hygiene status, Disabled- and elderly people-related facility, Overall satisfaction).
3. There is no significantly different satisfaction with safety among groups categorized by age.
4. The more visitors are satisfied with Safety and Emergency facilities, the stronger their intention to re-visit.

The results of the latter study (Kwon & Park, 2000b) are as follows:

1. The female group was significantly more satisfied with all factors (Safety facility, Hygiene status, Emergency facility, Disabled- and elderly people-related facility) than the male group.
2. The less educated the visitors, the more satisfied they are with safety factors (Safety facility, Hygiene status, Disabled- and elderly people-related facility). This certain consistent trend can be found in other research (e.g., Park et al., 1999; Park, 2000b).

3. There is significantly different satisfaction with safety among age groups. The youngest group (29 or under) is the most satisfied with every safety factor.
4. The more visitors are satisfied with Safety facility and Hygiene status, the stronger their intention to re-visit.

Those two studies will be summarized and compared with the results of this study in Conclusion and Table 7. Therefore this study will be the third one on the same safety topic.

### 3. DATA COLLECTION AND ANALYSIS

#### 3.1. Survey

Data used to investigate safety factors of concern to those who visited the Kwangju Biennale 2000 as a mega-event were obtained during April 23–29, 2000 in the city of Kwangju in Korea. If visitors agreed voluntarily to participate, a two-page questionnaire written in Korean was given, so all of the respondents were Korean.

**TABLE 1. Demographic Profile of Respondents**

Characteristics	Frequency	Percentage
Gender		
Male	89	48.1
Female	96	51.9
Residence		
Seoul	30	16.2
Kwangju	71	38.4
Cholla province	19	10.3
Other place	65	35.1
Education		
High school or lower	52	28.1
Undergraduate	118	63.8
Graduate or higher	14	7.6
Age		
Under 20	13	7.0
20–29	71	38.4
30–39	53	28.6
40–49	35	18.9
50 or over	12	6.5

The self-administered questionnaire includes questions pertaining to demographics, priorities for safety, and satisfactions with safety in this event place. Responses were marked on a scale of 1 to 5. Additionally, the suitability of this questionnaire had already been proved in two studies (Kwon & Park, 2000a; Park, 2000a). Of the 200 questionnaires, 185 were completed, representing a response rate of 92.5%. A profile of the demographic variables was presented using frequency analysis (Table 1).

### 3.2. Analysis

Analysis consisted of three steps. First, a factor analysis was performed for 15 safety-related statements using a varimax rotation procedure, and reliability coefficients for the mentioned four factors were obtained. Second, factor groupings of satisfaction with safety were compared across three demographic attributes, that is, gender, education, and age using *t* test and ANOVA. Third, the relation between satisfaction with safety and intention to re-visit was analyzed using multiple regression.

## 4. RESULTS

The results of a factor analysis of 15 safety items are shown in Table 2. Four factors, which explained 71.75% of the overall variance, were identified as dimensions of safety and were labeled (a) Hygiene status of event place, (b) Emergency facility of event place, (c) Safety facility of event place, and (d) Disabled- and elderly people-related facility of event place.

Each dimension was labeled based on the characteristics of the safety variables that are part of the different factors. The eigenvalues of all the dimensions were higher than 1.0 and the reliability coefficients were higher than .7.

Table 3 provides the results of *t* tests of the four safety factors and overall satisfaction by gender. This study reveals that significant differences exist between male and female visitors with respect to Emergency facility, Safety facility, and Overall satisfaction. With these three factors, the male group was significantly more satisfied than the female group. Different from the studies shown in Table 7 (Kwon & Park, 2000b; Park, 2000b), these results indicated that the male group was significantly more satisfied with all factors except Hygiene status, and vice versa.

TABLE 2. Factor Analysis Results of Safety Consciousness

Factor	Factor Loading	Eigenvalue	Variance Explained	Reliability Coefficient
Hygiene status		5.531	36.87	.879
Cleanliness of event place	0.813			
Hygiene (status) of restaurant food	0.872			
Cleanliness of restroom	0.848			
Cleanliness of water-supply equipment	0.794			
Emergency facility		2.478	16.52	.835
Sign to drug store	0.727			
Sign to broadcasting room	0.797			
Sign to police station	0.843			
Sign to emergency room	0.748			
Safety facility		1.559	10.40	.815
Emergency escape sign	0.791			
Fire extinguishing facility	0.815			
Safety of recreation equipment	0.752			
Warning sign	0.738			
Disabled- and elderly people related-facility		1.194	7.96	.880
Facility for seniors	0.861			
Facility for persons with disabilities	0.855			
Service for missing children	0.744			

TABLE 3. *T* Test Results of Satisfaction With Safety by Gender

Factor	Males			Females			<i>T</i>	<i>p</i> Value
	Number	<i>M</i>	<i>SD</i>	Number	<i>M</i>	<i>SD</i>		
Hygiene status	89	3.27	0.82	96	3.34	0.72	0.634	.527
Emergency facility	89	2.87	0.86	96	2.63	0.72	2.023	.045**
Safety facility	89	2.94	0.74	96	2.70	0.73	2.221	.028**
Disabled- and elderly people-related facility	89	3.02	0.99	96	2.97	0.86	0.410	.683
Overall satisfaction	89	3.06	0.63	96	2.88	0.54	2.031	.044**

Notes. \*\*.01 < *p* < .05.

The results of *t* tests of the four safety factors and another factor, Overall satisfaction, by education background are presented in Table 4. Between the high school or lower group and the undergraduate or higher group, statistically significant differences were noted in four factors, such as Safety facility, Hygiene status, Disabled- and elderly people-related facility, and Overall satisfaction. Moreover, the mean values for all factors of the high school or lower group are also higher than those of the undergraduate or higher group.

Like the two studies (Kwon & Park, 2000a; Park, 2000a) that are compared in Table 7 these findings also suggest that the less educated the visitors are, the more satisfied with safety they are. Except for Hygiene status the mean values of the higher educated group are all lower than average (neutral), 3.0.

**TABLE 4. T Test Results of Satisfaction With Safety by Education**

Factor	High School or Lower			Undergraduate or Higher			T	p Value
	Number	M	SD	Number	M	SD		
Hygiene status	52	3.63	0.69	132	3.17	0.76	3.736	.000***
Emergency facility	52	2.97	0.74	132	2.65	0.81	2.505	.013**
Safety facility	52	2.98	0.67	132	2.75	0.76	1.967	.051
Disabled- and elderly people-related facility	52	3.08	0.89	132	2.97	0.94	0.624	.533
Overall satisfaction	52	3.13	0.57	132	2.90	0.59	2.458	.015**

Notes. \*\*.01 < p < .05, \*\*\*p < .01.

Results of the analysis of variance (ANOVA) for the five-point scales by age are displayed in Table 5. This analysis revealed that significant differences existed in four factors, Emergency facility, Safety facility, Disabled- and elderly people-related facility, and Overall satisfaction. The 30–39 age group was more satisfied with all factors excluding Hygiene status than any other groups whereas the 29 or under age group was the least satisfied with all factors. These results mean that the 29 or under age group as the largest market in this study will have to be more precisely analyzed from the viewpoint of the safety factors.

**TABLE 5. ANOVA Results of Satisfaction With Safety by Age**

Factor	29 or Under		30–39		40 or Over		F	p Value
	Number	M	Number	M	Number	M		
Hygiene status	84	3.24	53	3.38	47	3.35	0.611	.544
Emergency facility	84	2.53	53	2.95	47	2.88	5.725	.004***
Safety facility	84	2.56	53	2.99	47	3.07	9.739	.000***
Disabled- and elderly people-related facility	84	2.76	53	3.31	47	3.02	6.237	.002***
Overall satisfaction	84	2.77	53	3.17	47	3.07	9.182	.000***

Notes. \*\*.01 < p < .05, \*\*\*p < .01.

The regression results of “To what extent did satisfaction with safety influence your intention to re-visit?” are shown in Table 6. The independent variables for this analysis were represented by the four safety factors. Whereas Safety facility and Disabled- and elderly people-related facility do not significantly affect the visitors’ intention to re-visit, the coefficients are statistically significant in two factors: Hygiene status and Emergency facility. Especially the factor of Emergency facility appears to have the strongest influence on the visitors’ decision to visit again. The goodness of fit test shows that the results explain 34% of the variation in the dependent variable Intention to re-visit.

In summary, the results suggest that the more visitors are satisfied with Hygiene status and Emergency facility, the stronger their intention to re-visit.

**TABLE 6. Regression Results for the Relation Between Satisfaction and Intention to Re-Visit**

Factor	<i>B</i>	<i>SE B</i>	<i>Beta</i>	<i>T</i>	<i>p</i> Value	
Hygiene status	.185	.090	.149	1.842	.047**	$R^2 = .34$
Emergency facility	.446	.114	.349	3.897	.000***	$F = 14.15$
Safety facility	.071	.119	.050	0.597	.551	$p$ value = .000
Disabled- and elderly people-related facility	.019	.092	.016	0.211	.833	

Notes. \*\* $.01 < p < .05$ , \*\*\* $p < .01$ .; *B*—regression coefficient, *beta*—standard regression coefficient (0–1), *SE*—standard error.

## 5. CONCLUSION

A mega-event is an emerging market because of its role in enhancing the image of a destination and attracting tourists in the tourism industry as a business selling positive holiday experience to improve one’s quality of life (Clift & Page, 1996). Whereas safety in this market may affect tourist perception of the destination and pose a competitive factor for destination, there are quite a few studies on tourist safety within tourism studies to assess tourist satisfaction. Thus this study analyzed safety factors centering on visitor satisfaction and intention to re-visit among Korean visitors to the Kwangju Biennale 2000 as a mega-event in Korea. Hygiene status, Emergency facility, Safety facility, Disabled- and elderly people-related facility, and Overall satisfaction were used as safety factors. The results of this paper are as follows:

1. The male group was significantly more satisfied with Emergency facility, Safety facility, Disabled- and elderly people-related facility, and Overall satisfaction than the female group. Females were more satisfied with Hygiene status than males.
2. The less educated the visitors are, the more satisfied they are with safety factors (Hygiene status, Emergency facility, Safety facility, Disabled- and elderly people-related facility, Overall satisfaction). This is similar to the results of Kwon and Park (2000a) and Park (2000b).
3. The 30–39 group was more satisfied with all factors excluding Hygiene status than any other groups, whereas the 29 or under group was the least satisfied with all factors.
4. The more the visitors are satisfied with Hygiene status and Emergency facility, the stronger their intention to re-visit.

Table 7 shows these results compared with two previous studies (Kwon & Park, 2000a; Park, 2000a).

**TABLE 7. Regression Results for the Relation Between Satisfaction and Intention to Re-Visit**

Variable	Event		
	Kangwon International Travel Exposition (Kwon & Park, 2000b)	Hanam International Environmental Exposition (Park, 2000b)	Kwangju Biennale
Gender	Females were more satisfied with all safety factors than males	Males were more satisfied with all safety factors than females	Males were more satisfied than females with all safety factors except hygiene status
Education	The less educated the visitors, the more satisfied they were with safety factors	The same	The same
Age	Visitors 29 or under were the most satisfied with all safety factors	There is no significant difference	Visitors 29 or under were the least satisfied with all safety factors
Factors of intention to re-visit	Safety facility, hygiene status	Safety facility, emergency facility	Hygiene status, emergency facility

Like the previous two studies, these results in the education background imply the distinctive trend that the less educated are more satisfied with all safety factors than the more educated. However no trends in gender, age, or the factors of intention to re-visit could be found.

Therefore, the conclusion about safety satisfaction from the viewpoint of event visitors in Korea should be carefully made after more future studies about this field are examined.

## REFERENCES

- Bewes, P. (1993). Traumas and accidents. In R. Behrens & K. McAdam (Eds.), *Travel medicine* (pp. 454–464). London, UK: Churchill Livingstone.
- Clift, S., & Page, S. (Eds.). (1996). *Health and the international tourist*. London, UK: Routledge.
- Cossar, J. (1995). A medical perspective in health and international tourist. In S. Clift & S. Page (Eds.), *Travelers' health* (pp. 23–43). London, UK: Routledge.
- Cossar, J., Reid, D., Rallon, R., Bell, E., Riding, M., Folle, E., et al. (1990). A cumulative review of studies on travelers, their experiences of illness the implications of these findings. *Journal of Infection*, *21*, 27–42.
- Getz, D. (1997). *Event management & event tourism*. New York, NY, USA: Cognizant Communication Corporation.
- Heinrich, H.W., Peterson, D., & Roos, N. (1980). *Industrial accident prevention*. New York, NY, USA: McGraw-Hill.
- Johnston, M. (1989). Accidents in mountain recreation: The experiences of international and domestic visitors in New Zealand. *GeoJournal*, *19*, 323–328.
- Kotler, P., Haider, D., & Rein, I. (1993). *Marketing places*. New York, NY, USA: Free Press.
- Kwon, Y.G. (1999). *Industrial safety engineering*. Seoul, Korea: HyungSul. (In Korean).
- Kwon, Y.G., & Park, H.J. (1998). The safety management of lodging industry in Korea. In *The Fourth Asia Pacific Tourism Association (APTA) Conference Proceedings* (pp. 274–280). Danyang, Korea: Asia Pacific Tourism Association.
- Kwon, Y.G., & Park, H.J. (2000a). Safety concerns by visitors to a special event: An experience from the 1999 Kangwon International Travel Expo. in Korea. In *Fourth International Tourism in Southeast Asia & Indo-China: Development, Marketing and Sustainability (TSAIC) Conference Proceedings* (pp. 373–378). Chiang Mai, Thailand: THIIICSA.
- Kwon, Y.G., & Park, S.K. (2000b). Analysis of the safety factors for event visitors: '99 Hanam International Environment Exposition in Korea. In D. Podgórski & W. Karwowski (Eds.), *ERGON-AXIA 2000, Proceedings of the Second International Conference on Ergonomics and Safety for Global Business Quality and Productivity* (pp. 419–422). Warsaw, Poland: Central Institute for Labour Protection.
- Leonard, S.D. (1999). Relative influences of perceived frequency and seriousness on perceived risk. In G.C.H. Lee (Ed.), *Advances in occupational ergonomics and safety* (pp. 289–294). Amsterdam, The Netherlands: IOS Press.

- Lichtenstein, S., Slovic, P., Fischhoff, B., Combs, B., & Layman, M. (1978). Perceived frequency of low-probability lethal events. *Journal of Experimental Psychology: Human Learning and Memory*, 4, 551–578.
- Mill, R., & Morrison, A. (1985). *The tourism system, and introductory text*. Englewood Cliffs, NJ, USA: Prentice-Hall.
- Occupational Safety and Health Administration (OSHA). (1989). *Occupational safety and health standards for general industry*. Chicago, IL, USA: Commerce Clearing House.
- Page, S., Clift, S., & Clark, N. (1994). Tourist health: The precautions, behavior and health problems of British tourists to Malta. In A. Seaton (Ed.), *Tourism: The state of the art* (pp. 799–817). Chichester, UK: Wiley.
- Park, H.J. (2000a). Analysis of customer satisfaction and intention to re-visit of International Travel Expo 99 Kangwon-do in Korea. In *The 6th Asia Pacific Tourism Association (APTA) Annual Conference Proceedings* (pp. 501–509). Phuket, Thailand: Asia Pacific Tourism Association.
- Park, H.J. (2000b). Analysis of safety factors for event visitors: 99 Hanam International Environmental Exposition in Korea. In *The 6th Asia Pacific Tourism Association (APTA) Annual Conference Proceedings* (pp. 484–488). Phuket, Thailand: Asia Pacific Tourism Association.
- Park, H.J., Yoo, S.D., & Park, Y.S. (1999). The analysis on the relationships about tourist's activities—Motivation pre-expectation post-satisfaction intention to revisit: Focused on the tourists visiting to the beach villages in Kangwon Province. *Journal of Travel Study*, 10, 123–139. (In Korean).
- Paxiao, M., Dewar, R., Cossar, J., Covell, R., & Reid, D. (1991). What do Scots die of when abroad? *Scottish Medical Journal*, 36(4), 114–116.
- Pinhey, T.K., & Iverson, T.J. (1994). Safety concerns of Japanese visitors to Guam. *Journal of Travel & Tourism Marketing*, 3(2), 87–94.
- Random House dictionary of the English language*. (1987). New York, NY, USA: Random House.
- Sirakaya, E., Sheppard, A.G., & McLellan, R.W. (1997). Assessment of the relationship between perceived safety at a vacation site and destination choice decisions: Extending the behavioral decision-making model. *Journal of Hospitality and Tourism Research*, 21(2), 26–32.
- Stokes, J.W. (1982). *How to manage a restaurant*. Dubuque, IA, USA: Brown.
- Vanhove, D., & Witt, S. (1987). Report of the English-speaking group on the conference theme. *Revue de Tourisme*, 4, 10–12.
- Webster's new world dictionary*. (1984). Seoul, Korea: Warner Books.
- Zins, A.H. (1998). Leisure traveler choice models of theme hotels using psychographics. *Journal of Travel Research*, 36(4), 345.