

문화인종적 차이에 따른 혼잡규범으로서의 스키장 이용밀도의 선호도 연구

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Ethnic Differences in Preferences of Use Density in Ski Area as Crowding Norms

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요 약

교통의 발달 및 빈번한 文化와 정보의 교류는 옥외 recreation 활동 참여의 다양한 人種的 구성을 가져왔다. 이 연구의 목적은 옥외 recreation 활동의 하나인 스키장에서 이용 밀도에 대한 선호도를 문화·인종간의 혼잡규범적 차이로서 해석하는데 있다. 韓國의 龍平 스키장과 미국 Hunter Mt. 스키장(New York주)에서 韓國人, 在韓 美國人, 美國人, 在美 韓人들을 대상으로 이용밀도에 관한 선호도를 측정하기 위한 설문조사를 실시한 결과, 1,157부의 설문지를 回收하여, 문화·人種간의 차이를 규명하기 위하여 Kruskal-Wallis Test 실시하였다. 연구의 결과로서 재미한국인(移民집단)의 이용밀도에 대한 선호도가 동일 人種인 한국인집단보다 사회문화적으로 공통성이 있는 미국인집단에 더 유사하였으며 그와 반대로 재한미국인집단(단기체류자집단)은 동일 인종집단인 미국 집단과 차이가 없었다. 이 결과는 혼잡 규범으로서의 이용밀도의 선호도가 이용자의 개인적 특성 및 인종적(racial) 특성뿐만이 아니라 문화인종적(ethnic)특성에 영향을 받는다는 결론을 얻었다.

1. BACKGROUND

Outdoor recreation management must deal with two goals: i) provide visitors with quality recreation experiences, and ii) protect recreation resources. The quality of recreation experience is often defined in terms of visitor satisfaction and social carrying capacity (Herrick & McDonald, 1992; More & Buyhoff, 1979). Useful tools for the evaluation of social carrying capacity have been developed. Two such tools are the satisfaction model and the crowding model. Early studies on the satisfaction model focused particularly on user satisfaction and hypothesized that as use levels increased in recreation areas, individual satisfaction declined. These studies, however, had failed to empirically support this relationship. Satisfaction cannot be predicted simply from user density or user contact variables because the multiple expectations of visitors may be affected in different ways by use levels and because changes in attitudes and/or behavior may cause satisfaction to remain high under varying levels of density. The crowding model also has limitations because visitors experience crowding not only when they come into contact with other visitors, but also when contacts exceeded their expectations and preferences. In addition, although perceived crowding is influenced by use level (density), its influence is mediated by various factors such as individual, social, and situational factors (Womble, 1981; Graefe et al, 1984; Manning, 1986; Manning and MaCool, 1995). In order to overcome these dilemmas, many researchers have expanded the satisfaction model to include the normative approach to crowding.

Visitors have different socio-economic characteristics, are exposed to different

cultural and ethnic backgrounds, and have various attitudes, motivations, preferences, and past experiences. For these reasons, recreation has been described as a basic component of individual and social behavior. As society becomes more multilateral, recreation participants come from diverse backgrounds. A major factor that recreation managers address to consider is the social, cultural and ethnic background of visitors (Bass and Chavez, 1993). Services and recreation opportunities should be more accessible and open to visitors who have various socio-economic, cultural, and ethnic backgrounds. Many studies on socio-economic aspects of recreation visitor, such as income, age, occupation, and gender, have been analyzed in order to deal with various visitor groups. Unfortunately, the studies on cultural and ethnic aspects have not been studied as thoroughly as socio-economic aspects.

The goal of this study is to explore how crowding norms vary by different ethnic characteristics of skiers. More specifically, this study is to compare the differences in preference of ski area density as one of crowding norms by four different ethnic groups which include two different races and two different countries. The research question is:

How do preferences for density as a crowding norm in downhill and uphill settings vary by each ethnic group (Korean skier in Korea, Korean skier in the US, White skier in Korea, and White skier in the US)?

2. CROWDING NORMS

It is generally accepted that there is a dis-

tinct difference between density and crowding (Stokols, 1972; Stockdale, 1978; Gramann, 1982). Density refers to a physical condition involving spatial limitation. In contrast, crowding is an experiential state affected by situational, social, and personal factors. Stankey and McCool (1989) explained that crowding is a negative evaluation judgement that a given density is excessive and that it impairs an individuals satisfaction or performance. Therefore, crowding is a psychological reaction of experience to the physical component of density. The traditional crowding studies in recreation assume that use levels (densities) influence the number of contacts between visitors, and these contacts influence perceived crowding. Most of these researchers reported a positive effect as use levels increase, visitors were more likely to evaluate their experiences as crowded" (Hammit et al, 1984; Bultena, 1981; Vaske et al, 1982; Shelby et al, 1983). Also, these researchers have found that perceived crowding is influenced more by a series of factors such as individual, social, and situational ones rather than by use level (density) as a single factor (Graefe et al., 1984; Vaske et al, 1982). However, it is difficult to conceptualize and simplify these multiple factors for measuring perceived crowding. In this respect, many studies use crowding norms because the normative approach is a useful way to conceptualize, collect, and analyze empirical data on perceived crowding. Crowding Norms are, in sociological terms, norms that describe the accepted or required behavior for a person in a particular situation (Landis, 1974). In recreation studies, Vaske and others (1993) define norms as "what

people think behavior ought to or should be" and are characterized as "standards" that individuals use for evaluating activities, environmental, or management proposals are as "good or bad", "better or worse". Norms have been widely researched because norms regulate both individual behavior and form the basis for evaluating the appropriateness of the behavior of others (Roggenbuck et al, 1991). Throughout the research, crowding norms are generally based on three factors: i) personal norms (personal characteristics), ii) social norms (encounter characteristics), and iii) situational variables (type of area, location, environmental factors). Roggenbuck and others (1991) distinguish between social norms and personal norms by how they shape behavior. Social norms are perceived by the individual to be shared by members of the group, and to have socially mediated sanctions or rewards to enforce them ("social norms are standards of what is acceptable and not acceptable that are shared by members of a group"). Personal norms arise from within the individual as feelings of moral obligation. Self-concept and the desire to enhance one's sense of self-worth motivate behavior to conform to personal norms. In conclusion, norms are rules that prescribe what people should think, say or do in specific circumstance. Personal norms reflect an individuals' standards about what is acceptable, while social norms are standards shared by members of a social group. Personal norms may differ from social norms, but usually an individuals' personal norms are similar to the social norms of groups to which they most closely associate.

3. ETHNICITY AND RECREATION

Numerous social studies point out the differences between ethnicity and race as racial identity is not simply a matter of ethnic status, but is a meaningful social category of and by itself. However, many contemporary sociologists point out that race is also a social fact much more than it is a biological fact. Because race is a group of people who others believe share certain physical traits and are genetically distinct (Hutchinson, 1987; Gordon, 1978; Banton, 1987; Popenoe, 1991). Thus, the fact that ethnic and racial groups overlap often cause some confusion. Ethnic diversity of recreation users has implications for recreation resource based management that include: the activities participated in, the design and planning of the recreational setting and facilities, the visitor programs developed, and the communication and marketing of recreation facilities. For several decades, recreation and leisure researchers have been interested in issues involving ethnic, culture, social class, and recreation / leisure behavior (Washburn, 1978; Klobus-Edwards, 1981; McMillen, 1983; Stamps & Stamps, 1985; Allison, 1988; Dwyer & Hutchinson, 1990; Carr & Williams, 1993, Floyd et al., 1994). These studies show the evidence of differences in recreation behavior varying by different ethnic, cultural, and social class. It is generally reported in the literature that two conceptual approaches are frequently cited to explain ethnic differences in participation patterns. The first approach is "the marginality hypothesis" which emphasizes that differences in participation are the influence of factors such as low socio-economic status, lack of access to desire facilities, and dis-

crimination. The second approach is termed the "ethnicity hypothesis" which emphasizes that differences in participation patterns between different ethnic groups or within ethnicity (intergroup variation) are not so much a function of socio-economic variables as they are the result of culturally transmitted norms, values, and expectation of the subculture groups. Consistent findings of several studies that examined the marginality / ethnicity framework is that ethnic differences in participation rates remain even when socio-economic factors are controlled. These studies reported that there was greater similarity in leisure/ recreation activities for persons of the same ethnic and cultural group, than those of similar socio-economic class. Behavior of outdoor recreationalist have interpreted as an environmental psychology. There are well known differences in human spatial behavior and crowding perception between different ethnic and cultural backgrounds throughout previous environmental psychology(i.e., contact culture vs. non-contact culture, Buddhism culture vs. Christianity culture). Based on these abundant theocratical resources, numerous studies report behavioral and cognitive differences in crowding perception of outdoor recreation settings between different race, culture, and ethnicity (Dwyer & Gobster, 1992; Dawan, 1991). These studies denote that crowding perception and preference of use density are more influenced by culture and ethnicity of recreationalists than socio demographic characteristics.

In conclusion, the current research trend of ethnicity in recreation is focused on ethnicity hypothesis to recognize differences of subculture and ethnic itself rather

than the marginality hypothesis to recognize differences of socio-economic status.

4. RESEARCH METHODOLOGY

1) MEASUREMENT

Many previous studies on recreation crowding define preference as "beliefs about desirable or ideal condition or preferred numbers of other people to encounter or see (Vaske, 1978; Shelby et al, 1983; Ditton, 1983). These studies measured preference in two ways: i) respondents were asked to indicate the number of others they preferred to see, and ii) respondents were asked to indicate the highest number of encounters they would tolerate or accept before the experience became unpleasant. In this study, the second method is considered more tangible for measuring preferences than the first. Because preference is complex and it may include too many ideal conditions of setting, respondent find it difficult to conceptualize the request answers. While, the preference items ask about acceptance or tolerance level of setting, may provide precise decision making to respondent.

Preference measurements of this study used two different terms for the type of use area: i) Uphill- "acceptable time (minutes) for waiting at a ski lift without feeling unpleasant", ii) Downhill - "acceptable number of other skiers encountered during skiing". However, the measurement of preference in downhill using a single item would be very difficult because skiing is a high speed activity and it is hard for a user to conceptualize a certain number as

being too much or acceptable. Therefore, the preferred number of encounters will be substituted by using three items that ask respondents to indicate: i) the highest number of times they reduced their speed, ii) number of times they stopped, and iii) number of times they changed the direction of skiing to avoid other skiers they would accept before their skiing experience became unpleasant. The measurement of preferences for uphill was to ask respondents to indicate the greatest number of minutes of waiting for a riding ski lift that they would accept before their skiing experiences became unpleasant., and was to ask to indicate the greatest number of times of selecting other lifts because of a long waiting line at the lift which they want to ride

2) SAMPLING PROCEDURE

The study sites were selected two ski areas. One is a site in Korea (Yong Pyeong Resort), the other is a site in the US (Hunter Mt.). Sampling sessions at Yong Pyeong were six days and sampling at Hunter Mt. were also conducted for six days. The sampling method of this study employed stratified sampling. The purpose of this study was to compare between different ethnic groups, so it was necessary to have homogeneous subgroups of Korean skiers and White skiers in both study sites, Korea and the U.S. If this study employed only a random sampling method from the entire population at each study area, the sample sizes from the minority populations (Korean skiers in the US and White skiers in the Korean) might have been not large enough for statistical analysis, and produce a large sampling error. For these reasons, this study used strat-

ified sampling method with quota sampling concept. The first step of the sampling procedure was to stratify two homogeneous subgroups at each site. The second step was to collect respondents every 15th Korean skiers in Yong Pyeong and White skiers in Hunter Mt., and every 3rd White skiers in Yong Pyeong and Korean skiers in Hunter Mt. who enter the main ski lodges in both sites.

3) DATA COLLECTION TECHNIQUES

An on-site self-administered questionnaire surveys was used for this recreation research. The sampling approach in a ski area was very difficult because skiers have high mobility and they circulate over the same area. Mills (1981) suggests a sampling approach. The limitations of Mill's sampling method are i) it is possible to miss season ticket holders, ii) selected samples may not be able to appear at the designated time and on the designated place, and iii) potential of low response rate from mail questionnaires. In order to overcome these limitations, sampling was conducted at the main entrance of ski lodges in both ski sites, and questionnaires were distributed when the selected samples sit on tables in the ski lodges and these were collected immediately after the respondent finished answering the questions.

4) DATA ANALYSIS

The collected questionnaires were translated into the appropriate form for computer analysis (SPSS: Statistical Package for Social Science PC+ 6.0). This study aimed to compare differences in means of preference as a crowding norm among each of four eth-

nic and locational skier groups. The Kruskal-Wallis tests (a non-parametric alternative to one way ANOVA) were used to analyze the differences between preferences among the skier four ethnic groups (Korean skiers in Korea, White skiers in Korea, White skiers in the US, and Korean skiers in the US) because the variances of all groups were not equal.

5. RESULTS

1) DESCRIPTIVE STATISTICS

From the on-site questionnaire survey process, 1,157 individuals were available for use in analysis based on the study purposes. Survey sampling was conducted in 1966 on two 3-day weekends in February (Feb.2-Feb.11) at Yong Pyeong and on three 2-day weekends in February -March (Feb.24-Mar.11). Table 1 summaries the characteristics of respondents. The most frequently reported age group was from 25 to 34 years old. The number of respondents in the under 25 year old age group and female of White skiers in Korea (Wk) was relatively low compared to other groups. This may be because the population of Whites in Korea is not made up of immigrants or residents, but they are in Korea for business. This may explain why the White population is skewed to 30-50 year old age groups. The party sizes and the associations of each group were relatively similar. It was common that a skier was participating in skiing with three or five of his/her friends. In addition, skiers seldom participated in skiing alone, the rate of solo participation in White skier in the US (Wu) is higher than other groups.

Table 1. Frequency Table of Respondents' Characteristics

| Description | | Total | Kk | Wk | Wu | Ku |
|-----------------|---------------------|-------------|-------------|-------------|-------------|-------------|
| | | N=1,157 | n=502 | n=116 | n=415 | n=124 |
| Gender (%) | male | 59.0 | 58.8 | 74.1 | 56.9 | 52.4 |
| | female | 41.0 | 41.2 | 25.9 | 43.1 | 47.6 |
| Age(years) (%) | 16-18 | 8.1 | 4.8 | 3.4 | 13.5 | 8.1 |
| | 10-24 | 18.9 | 20.9 | 5.2 | 22.2 | 12.9 |
| | 25-34 | 45.0 | 47.8 | 35.3 | 41.7 | 54.0 |
| | 35-44 | 18.6 | 21.5 | 31.9 | 13.0 | 12.9 |
| | 45-54 | 6.6 | 4.2 | 16.4 | 6.4 | 8.1 |
| | over 55 | 2.7 | 8.0 | 7.8 | 3.4 | 4.0 |
| Association (%) | Family | 15.6 | 14.3 | 27.6 | 12.0 | 21.8 |
| | Friends | 47.3 | 41.7 | 37.9 | 56.6 | 47.6 |
| | Family & Friends | 17.9 | 13.9 | 25.9 | 18.6 | 24.2 |
| | Business Associates | 13.6 | 25.3 | 6.9 | 4.1 | 4.0 |
| | Other | 4.0 | 4.2 | 1.7 | 5.1 | 1.6 |
| | Alone | 1.5 | 0.6 | 0.0 | 3.1 | 0.8 |
| Party Size (%) | 1 - 2 | 19.7 | 13.1 | 9.5 | 27.2 | 25.8 |
| | 3 - 5 | 42.4 | 46.0 | 44.8 | 41.2 | 36.3 |
| | 6 - 10 | 22.6 | 21.5 | 22.4 | 20.2 | 29.8 |
| | 11 - 20 | 8.7 | 10.6 | 13.8 | 4.8 | 7.3 |
| | over 20 | 6.6 | 8.0 | 8.6 | 5.8 | 8.0 |

Kk=Korean skiers in Korea, Wk=White skiers in Korea,
Wu=White skiers in the US, Ku=Korean skiers in the US

Preference were measured by asking respondents for their level of acceptance for each setting. They were asked to select from two different measures of acceptance for crowding density : uphill(delay for uphill-ski lift) and downhill (preference of encounters in downhill ski slope). Two parameters were used to measure acceptable delays for uphill skier transport density: i) acceptable length of time for riding a ski lift, and ii) acceptable number of times that selection of another lift was necessary due to a long wait. Table 2 summarizes comparisons of the mean values and standard deviations of each of these items by group as a descriptive statistics. Both Korean and White skiers in Korea preferred shorter times for riding a lift than did White and Korean skiers in the U.S. The average number of times

for selecting another ski lift was also different among the study sites. Skiers in Korea preferred fewer changes to another ski lift than skiers in the US.

Table 2. Acceptance Average for Skier Uphill Transport

| Item\Group | Total | Kk | Wk | Wu | Ku | |
|--------------------------------|---------------|---------|------------|--------------------|------|------|
| Waiting Time | Mean(minutes) | 7.33 | 6.38 | 7.10 | 8.09 | 8.78 |
| | Std. Dev. | 4.59 | 4.25 | 3.20 | 4.84 | 5.34 |
| Levene Test: Statistic (7.21) | | df.1(3) | df.2(1150) | 2-tail sig.(0.000) | | |
| Select Other Lifts | Mean(times) | 2.74 | 2.35 | 2.40 | 3.15 | 3.04 |
| | Std. Dev. | 2.15 | 1.80 | 1.57 | 2.45 | 2.17 |
| Levenw Test: Statistic (12.43) | | df.1(3) | df.2(1131) | 2-tail sig.(0.000) | | |

The correlation coefficient of two items (waiting time and selecting other lifts) was low ($r = 0.25$), therefore, it was not appropriate to index these items as a single score. For this reason, this study used only "waiting time for riding a lift" because measurement of it was a clear description of the preference for uphill density (ski lift) than was the measurement of the number of times skiers selected another lift.

In order to measure the level of acceptance for crowding density on downhill ski slopes, respondents were asked "how many times is it acceptable for you to i) reduce your ski speed, ii) stop your skiing, iii) change your direction for other skiers,

Table 3. Reliability Test of Downhill Skiing Preferences for Crowding Density based on Three Behavioral Acceptance Items

| Item | Mean (Times of Acceptance for Behavior) | Std.Dev. | Corrected Item-Total Correlation | Alpha (if item deleted) |
|------------------|---|----------|--|-------------------------------|
| Direction Change | 5.29 | 3.98 | 0.54 | 0.78 |
| Speed Reduce | 4.85 | 3.18 | 0.64 | 0.65 |
| Stop | 3.26 | 3.08 | 0.64 | 0.50 |

* Cronbach Alpha = 0.77

without unpleasant?" These three items were tested a reliability of inter-item scale. Table 3 shows the results of reliability test between the items. Three items were highly inter-correlated with a reliability coefficient (Cronbach's Alpha) value of 0.77. It was concluded that the research design for measuring preferences of encounter in downhill skiing (acceptance for crowding density on downhill ski slope) was quite fair, and these three items could be indexed as a single scale as an indicator of preference level in downhill ski slope density.

Table 4. summarizes the descriptive statistics for the preference level for downhill ski slope density based on three behavioral changes used by skiers. The average values for the number of changes in direction to avoid other skiers while skiing was the highest among the three items. Average values for the number of times stopping while skiing was the lowest item. Skiers did not object to changing their skiing direction for other skiers. On the contrary, skiers did not want to stop for other skiers. For all three items, Korean skiers in Korea had a lower mean acceptance range compared with other groups. Especially, the number of directional changes was very low among the four groups. It might be interpreted that Korean skiers in Korea were mostly beginner or intermediate skiers, so they probably felt it was difficult to control their skiing direction as a means of preventing a collision when other skiers approached. The last row of the Table 4 describes the computed scale score for the three items. The scale score of the Korean skiers in Korea was also the lowest among groups.

Table 4. Acceptance Average for Downhill Ski Density based on Three Behavioral Items.

| Item\Group | Total | Kk | Wk | Wu | Ku |
|------------------------|-----------------|------------|------|--------------------|------|
| Direction Change | 5.29 | 4.23 | 8.16 | 7.04 | 6.95 |
| Reduce Speed | 4.85 | 4.04 | 4.97 | 5.40 | 5.98 |
| Stop | 3.26 | 2.89 | 3.05 | 4.38 | 4.88 |
| Computed Scale Score | 4.80 | 3.76 | 5.40 | 5.01 | 5.88 |
| Levene Test: Statistic | (38.18) df.1(3) | df.2(1141) | | 2-tail sig (0.000) | |

2) TEST RESULT

In order to find out statistical differences in preferences of downhill ski area density and uphill skier transport (ski lift waiting time) among each ethnic groups, Kruskal-Wallis tests were conducted. Table 5 shows the differences in uphill skier transport preference. The small significant levels were observed, so that it could be concluded that preferred time to wait for a ski lift is not same for all group.

Table 5. Kruskal-Wallis Test Result of Hypothesis that Preferred time to wait for a lift ride is different among each group.

| Group | Case | Mean Rank | Kruskal-Wallis H Statistic | | |
|-------|-------|-----------|----------------------------|----|-------------|
| Kk | 499 | 500.49 | Chi-square | df | Significant |
| Wk | 116 | 596.84 | 49.92 | 3 | 0.0000 |
| Wu | 415 | 636.73 | Corrected for ties | | |
| Ku | 124 | 671.09 | 51.37 | 3 | 0.0000 |
| total | 1,154 | | | | |

Especially, the Kk group of skiers had the lowest rank among the groups. This suggests that the Kk skiers preferred a shorter time to wait for a lift ride than the other groups

From the result of Kruskal-Wallis test, differences in comparisons with each pair could not be known. In order to find out which

group or/and groups are different among groups, multiple comparison procedure was conducted. According to this results (table 6), Md values of the pair comparisons that involve Korean skier in Korea had larger than Mc value. On contrary, Md values of others had smaller than Mc value. It could be interpreted that Korean skier in Korea is different from other groups. Therefore, it could be concluded that the preferred waiting times for ride a lift are same when the three groups, Wk, Wu, and Ku, were compared

Table 6. Multiple-comparison for Kruskal-Wallis test in Uphill

| Group | Md * | | Mc** |
|----------|--------|---|-------|
| Kk vs Wk | 96.35 | > | 65.63 |
| Kk vs Wu | 136.24 | > | 42.43 |
| Kk vs Ku | 170.6 | > | 63.96 |
| Wk vs Wu | 39.89 | < | 67.08 |
| Wk vs Ku | 74.23 | < | 82.60 |
| Wu vs Ku | 42.10 | < | 65.16 |

* $R_i/n_i - R_j/n_j$

** $S^2(N-1-T)/N-k-1/2 (1/n_i + 1/n_j)1/2$

This study also tested how preferred time to wait varies by each ski area and each ethnic group. These tests were compared by three different pairs: different ethnicity by same ski area, same ethnicity by different ski area, and different ethnicity and different ski area. In order to prefer a statistical comparison, the Mann-Whitney test was used. In comparing different ethnicity at the same site there was no significant difference in preferred time to wait for a lift ride between the two groups at the US site. The p-value of comparison between Korean skiers and White skiers in the US site was greater than 0.05 ($p = 0.232$). While, a small significant level was observed when comparing the two skier groups at the Korean site. The

preferred time to wait for a lift ride between Kk and Wk were different ($p = 0.013$). In comparing same ethnicity and different ski area, there was no difference in the preferred time to wait for a lift ride between White skiers ($p = 0.148$), while Korean skiers had statistically different in the preferred time to wait for a lift ride ($p = 0.000$). There were statistically different results for preferred time to wait for a lift ride between different ethnicity and different ski area ($p = 0.000, 0.035$).

In conclusion, the preferred time to wait for a lift ride was different among the groups. Some comparisons had too large a significance values to accept the hypothesis that the two groups had equal preferred time to wait, when compare with the two ethnic groups under the combinations of ethnicity and ski area. It was expected that large p-values would be observed when Kk was not included in the test. Therefore, this study tested the mean ranks of three groups (Wk, Wu, and Ku) using the Kruskal Wallis test. The result of the test was that there was no significant difference among those three groups ($p=0.106$). This suggests that preferred time to wait for a lift ride is influenced by ethnicity, and ski area rather than a single variable such as, ski area location or ethnic characteristics of skier.

Table 7. Kruskal-Wallis Test Result of Hypothesis that Preferred number of encounters with other skiers on a ski slope is different among each group.

| Group | Case | Mean Rank | Kruskal-Wallis H Statistic | | |
|-------|-------|-----------|----------------------------|----|-------------|
| Kk | 496 | 439.59 | Chi-square | df | Significant |
| Wk | 116 | 688.66 | 142.95 | 3 | 0.0000 |
| Wu | 410 | 667.86 | Corrected for ties | | |
| Ku | 123 | 685.70 | 143.32 | 3 | 0.0000 |
| total | 1,145 | | | | |

In order to test that "Preferred number of encounters with other skiers on a ski slope is different among each group", Kruskal-Wallis test was also conducted. Table 7 shows the test result and low significance levels were observed. Based on this, preferred number of encounters with other skiers on ski slope (preference of downhill ski slope density) is different among each of the group.

As same as Up hill test, table 6, multiple comparison procedure was conducted. The result of the test is presented in table 8.

According to the table, Korean skier in Korea was different from other group, while the remain three groups was same. It could be interpreted that Korean skier in Korea has different level of preference of use density on ski slope from other three groups.

Table 8. Multiple-comparison for Kruskal-Wallis Test in Downhill

| Group | Md* | | Mc** |
|----------|--------|---|-------|
| Kk vs Wk | 249.07 | > | 62.41 |
| Kk vs Wu | 238.27 | > | 40.46 |
| Kk vs Ku | 246.11 | > | 34.10 |
| Wk vs Wu | 20.80 | < | 63.74 |
| Wk vs Ku | 45.04 | < | 78.46 |
| Wu vs Ku | 17.84 | < | 62.12 |

* $R_i/n_i - R_j/n_j$

** $S^2[(N-1-T)/N-k]^{1/2} (1/n_i + 1/n_j)^{1/2}$

The preference was also tested using the Mann-Whitney test in order to compare ethnicity and ski area. In the combinations of different ethnicity and ski area, one case that compared Kk and each of the three group resulted in a small p-value (0.000). Similar to the test results for uphill preference (preferred time to wait), there were large significant levels when Kk was not involved in

the comparison. This may be due to the average rank of Korean skiers in Korea was very different from the other skier groups. They preferred a lower number of encounters on ski slope than the other three groups.

In conclusion, this difference was mainly due to Korean skiers in Korea. Preference of downhill ski slope density of other three groups had no statistical difference. Similar to uphill testing results, preference for downhill is influenced by ethnicity of skier and ski area, rather than ethnic group or ski area alone.

V. DISCUSSION AND CONCLUSIONS

There were no statistical differences in preferences of uphill skier transport (waiting time for ski lift) and downhill skiing (encounter with other skier on the ski slope) as crowding norms in ski area if three groups (Korean skiers in the US and both White skiers in Korea and the US) were compared. This fact might be interpreted by acculturation. Crowding norms of Korean skiers in the US were similar to the crowding norms of White skiers at both Korean and the US compared to Korean skiers in Korea. It is possible that acculturation played a role as an intervening variable in crowding norms because Korean skiers in Korea mostly immigrated to the US. In contrast, crowding norms of White skiers in Korea were similar to White skiers in the US. Because they were temporary visiting Korea for tourism or business, so they did not need to acculturated or assimilate to Korean culture and behavior. These reasons may explain why Korean skiers in the US, as immigrants,

had different crowding norms than respondents from their original ethnic group (Korean skiers in Korea), while White skiers in Korea kept their original ethnic characteristics (White skiers in the US).

This difference was not only due to ethnic characteristics of skier but also various crowding norms, like as experience, motivation. Park(1996) reports that experience level of skiing (skiing skill and experience of site use) characterizes their behavior on ski area and their evaluation of ski area. Throughout multivariate analysis of the same data of this study, causal relationships were found. Motivations and experiences level of skier influence preference directly and indirectly. The results of this study suggest implications for management of downhill ski area, especially diverse ethnic groups in a ski area. The goal of outdoor management is well defined in previous studies. Herrick & McDonald (1992) state that the primary concern of recreation managers is to provide opportunities for the visiting public in anticipation of satisfying the needs of the visitors. The satisfaction is often defined in terms of social carrying capacity which concerns a relationship between user density and perceived crowding in a recreational setting (how much use is an appropriate use and what level of maximum use provides a quality experience without receiving a negative impact). Crowding in a outdoor recreational setting has been researched for management goals which provide appropriate use levels. These studies has consistently stated that visitors experience crowding not only when they come into contact with other visitors (density), but also when contacts exceeded their crowding norms (expectation, preference, experience,

motivation, and other social and situational factors). However, there is extremely limited number of studies on perceived crowding in downhill ski areas. With the lack of quantitative and qualitative data on skier behavior, it seems that management strategy of a downhill ski is dependent on empirical experiences of downhill ski area managers. In a comparative study on ethnic issues, levels of acculturation or assimilation to the host country or society could be an important variable. If this study measured these variables, ethnic differences in crowding norms may have been more clearly drawn. In future studies, a researchers will need to consider assimilation or acculturation, and to develop measurement methods (i.e., measurement of residential history in host country, amount of native ethnic culture contacts). In addition, the one of main issues for the future study is measurement of preference. Many outdoor recreation studies use acceptance level or tolerant level or avoidance level of encountering for measuring preference of use density and crowding level. These measurements have a validity as operationalization of study concept. However, this study, as an exploratory study, has a limitation of referring indicators for measuring preference from previous studies. The future study in ski area needs to develop multiple and various indicator for measuring prefer

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一定踏壓時 步道블릭鋪裝材 下部 土壤物理性的 變化가 造景樹 生育에 미치는 影響

- 鋪設모래 두께 및 粒徑을 實驗變異 因子로 設定하여 -

조 재 현

경희대학교 조경학과 박사과정

The Effect on the growth of landscaping trees by fixed trampling in brick paved under-surface soil physical properties .

- Sand bed's thickness & particle size were setted
by experimental variable factors -

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ABSTRACT

The purpose of this study is to find out the effects of brick paved under-surface soil physical properties which are changed by fixed trampling. Thus, a sandy loam which is known as a profitable soil for plants is used an experimental soil to study the changes of the soil physical properties. It is related to sand bed's thickness & particle size which are setted by experimental variable factors.

According to the variation of sand bed's particle size, bulk density and soil hardness at natural dried soil condition result in $0.075\sim 2.00\text{mm}$ > $2.00\sim 5.00\text{mm}$ > $2.00\sim 8.00\text{mm}$ > $5.00\sim 8.00\text{mm}$, and water content at natural dried soil condition results in opposition.

Also, bulk density and soil hardness & water content at natural dried soil condition are observed being insensible change rate from the point that sand thickness is $30\sim 40\text{mm}$ and more sand bed's thickness constructed by the variation of sand bed's thickness.