〔보 문〕

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The Preferred Style of Bicycle Apparel in Korea and the United States

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한국과 미국의 사이클 선수들이 선호하는 사이클복에 대한 조사 연구

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Abstract

한국과 미국의 사이클 선수들이 선호하는 사이클복에 대하여 조사하였으며, 착용실태 파악을 위한 설문조사는 1997년 8월~10월 사이에 한국과 미국에서 동시에 실시하였고, 총 145명(한국인=79명, 미국인=66명)의 설문결과가 데이터 분석에 이용되었다. 설문내용은 인적사항, 사이클복에 대한 인식 및 계절에 따라 선호하는 스타일 등에 대해 35문항으로 구성되어 있으며 질문형식은 그림형과 서술형으로 나누어 작성하였다. 데이터는 빈도와 백분율로 비교하였고 χ^2와 Fisher's exact 방법을 이용하여 그 결과를 고찰하였다.

한국인 사이클 선수들의 Rohrer 지수는 한국 표준 체위조사의 같은 나이 집단의 수치와 거의 차이가 없으며 미국인 남자 사이클 선수는 같은 나이 집단의 미국 군인들을 위한 체위조사 결과보다 낮은 수치를 나타냈다. 한국의 여자 사이클 선수들 중 79.6%가 사이클복이 시합이나 훈련 중 기록향상에 영향을 미친다고 응답하였다. 대부분의 미국인 사이클 선수들은 그들이 착용한 사이클복에 만족하고 있으며, 상하가 분리된 스타일을 선호하였다. 한국과 미국의 사이클 선수들은 jersey의 경우, round neckline에 stand collar가 있는 스타일을 좋아하며, jersey와 shorts 모두 몸에 꼭 맞는 스타일을 선호하였다.

Key words: bicycle apparel, preferred style, jersey, shorts; 사이클복, 선호스타일, 상의, 하의

I. INTRODUCTION

Bicycles have been used as means of long and short distance transportation, for leisure and fitness activities. In addition to bicycling for health and fitness, bicycling is a popular competition sport. Bicycling is an excellent way to exercise 20 to 60 minutes a day, 3 to 5 days a week for achieving good health and fitness(Carmichael & Burke, 1994). Bicycling can be an antidote to a sedentary and stressful lifestyle. Competitive bicycling stresses the cardiorespiratory system without putting excessive stress on the joints.

Bicycling ranks among the most popular of sporting activities in the U.S. The total number of cyclists who exercise regularly is estimated at more than 50 million by the Bicycle Institute of America. According to the Sporting Goods Manufacturing Association, over 5 million

Americans cycle at least 100 days a year. Adults make up 54% of this population of cyclists (Carmichael & Burke, 1994). Popularization of bicycling can lead national health improvement, emphasizing on mobility and fitness.

Recently life style has changed into complicate and diverse one. This brings about an increased stress and decreased exercise. The role specific nature of cycling clothing and its recent emergence as a fashion as well as a sport item lends a diversity of meanings to bicycling apparel, which may lead to a variety of uses of symbolic apparel(Casselman-Dickson & Damhorst, 1993). The functions of the bicycle clothes are divided into physiological and sensory comfort, psychological comfort, and health.

Thus, it is important for the clothing to have adequate elasticity of the clothing so as not to restrict the movement of the body. Besides satisfying the demand, appropriate choices regarding materials, patterns, and construction methods should be made to provide high performance and comfort. Much work has been done in other studies on physical responses while exercising(Burke, 1980; Pendergast, et al., 1977; Takeshima, et al., 1996; shim, 1994; Yamamizu, 1994). Almost no studies have been done on bicycle apparel for cyclist.

The ultimate objective of this study is to develop improved bicycle apparel for cyclists. As a first stage of this study, the preferred style of bicycle apparel in Korea and USA was investigated and the problems were identified which cyclists in each country had with their clothes. On the basis of the results from the survey on the preferred style in Korea and USA, different prototype outfits will be designed. In the near future, I will test these prototypes on cyclists.

II. LITERATURE REVIEW

1. The human body

The human body contains 605 muscles connected to the bones. The movement of the body occurs as a result of contraction and extension of the muscles(Yanagisawa Sumiko, 1979). The appropriate ease for bicycle apparel, the amount of stretch and contraction of fabrics should be considered to improve the mobility. Mobility is an important concern in the design of bicycle jersey and shorts because they are worn to exercise.

Watkins(1995) states that there are two basic approaches to increasing mobility in clothing: selecting a fabric that will move easily with the body and developing a garment design that promotes mobility. Takeshima et al.(1996) studied cardiorespiratory responses to cycling exercise in trained and untrained healthy elderly adults: with special reference to the lactate threshold. He determined that heart rate did not differ between trained and untrained elderly men. Burke(1980) studied physiological characteristics of national and international competitive cyclists. The highly trained male group showed significantly higher VO_2 max. Shim et al. (1991) state that appropriate stress and strain on the body can be used to improve the efficiency of exercise and to enhance the appearance and fit in the bicycle shorts, while excessive stress and strain causing indigestion and distress can injure internal organs. Bicycle clothing must accommodate a complex shape change which occurs with the continuous contraction and extension of hip joints and knee joints when riding a bicycle.

Figure 1 shows the 8 major muscles in the leg while riding bicycles. Hip and knee areas are being much deformed while riding bicycles. So

designer has to consider the movement of the knee when designing bicycle shorts. On the other hand, too much ease at knee area spoils the appearance and fit.

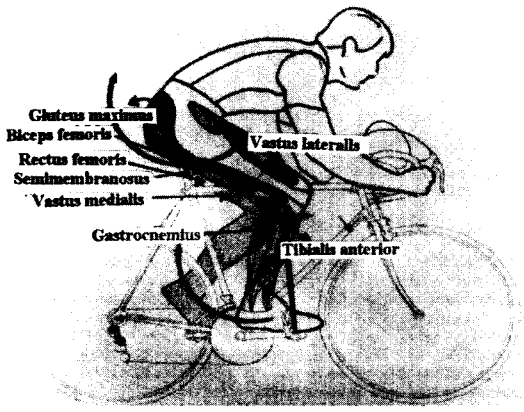

Fig. 1. Major muscles used in during bicycling.

2. Classification of bicycle apparel

Clothing should be designed to satisfy various factors-its functional, symbolic, and aesthetic aspect with suitable materials, and clearly identified needs according to the type of exercise done and the variety of exercise situations.

In case of the U.S., the popularization of bicycle has influenced to fashion. For example, shorts of cyclists come into fashion, so various equipment have been developed and used all over the world. In 1979, the boom of bicycle spread to solve traffic jams, parking problem, and environmental pollution in developed countries such as the U.S. However, wearing clothing designed specifically for riding bicycles has not been so popular in Korea.

Bicycle apparel is divided into three parts: jersey, shorts, and cool-weather gear(Zahradnik, 1989). Bicycle jerseys are usually made of materials that absorb and evaporate moisture from the skin. Because jerseys allow the movement of moisture, they reduce the risk of overheating. In cold weather conditions, this prevents the rider from feeling chilly and clammy. Bicycle Shorts contain a pad called a 'chamois'. This protects crotch area from abrasion. The back of bicycling jerseys and shorts are manufactured longer than the front in order to accommodate the riding posture. Shorts legs are made short not to be hiked up and to be comfortable. In response to the complaints about synthetic liners promoting yeast infections, most brands have ones that are quick in drying or that wick moisture to an outer fabric layer. Cool-weather gear consists of windproof, waterproof, and winter jacket, vest, and rain jacket. Other equipment including gloves, helmet, eye wears, special shoes, knee and leg warmers, and hats. Bicycle apparel sets new trend at color. Interbike Expo '98 shows that black, blue and maroon with a contrast horizontal panel of Hawaiian print fabric, along with contrast piping(Swantko, 1997). In the result of favorite color from survey, 50% of female Korean cyclists chose white as the first favorite color. The USA cyclists generally preferred to blue and black.

III. METHOD

1. Sampling and data collection

Data were collected using questionnaire between August and October, 1997 in Korea and the U.S. at the same time. The respondents of questionnaires consisted of 79 Korean men and women cyclists living in Korea, 66 American men and women cyclists living in the U.S. Korean respondents were Korean-speaking residents in Korea, American respondents were native-speaking residents in New York States. The total 145 questionnaires were used for data analysis. To obtain the usable data, the questionnaires were distributed to cyclists and were filled out while a researcher was watching.

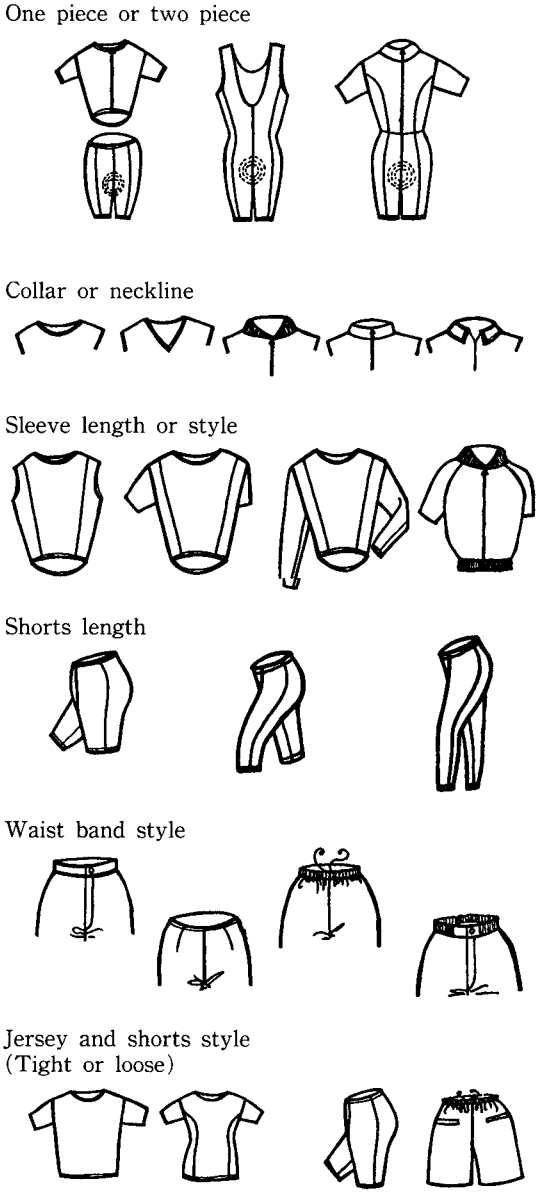

Fig. 2. Sketch of the bicycle apparel

A sampling technique focusing on the geographic area was adopted. Probability random sampling is more desirable, but is not easily accomplished because it is difficult to find competition cyclists. On the basis of the result from the survey on the preferred style of in Korea and the U.S., different prototype outfits will be designed.

2. Survey contents and data analysis

The questionnaire included 4 items on general demographics gender, age, height, and weight- and 17 items on level of satisfaction with bicycle apparel while bicycling. 14 items were also included on the typical bicycle apparel worn for summer and fall. Items of questionnaires are shown in Table 1. To illustrate different styles of bicycle apparel, Catalogs such as Cannondale, Pearl Izumi, Sunbuster, and the Paramount company were used as references. Figure 2 shows the

Table 1. Items of questionnaires

Demographics	Gender
	Age
	Height
	Weight
Perception of bicycle apparel	
	Effect of bicycle apparel
	The fit of bicycle apparel
	Satisfy or not of bicycle apparel
Dissatisfaction of jersey	The back
	The waist
	The armhole
	The sleeve
	The back gets blown up
Dissatisfaction of shorts	The waist
	The hip
	The crotch area
	The shorts leg hike up
	The waist band
	The short leg width
	The ankle
Style of bicycle apparel	One or two pieces
	Collar or neckline
	Length and style of sleeve
	Length of shorts/pants
	The waist band
	Jersey tight or loose
	Shorts tight or loose

diagrams of bicycle apparel.

Data from the survey on the bicycle apparel were analyzed using frequencies and percentiles. The differences between the responses of men and women in Korea and the U.S. from the survey were compared using a χ^2 and Fisher's exact test(Stokes, 1995).

IV. RESULTS

1. Distribution of the respondents

The Distribution of all respondents are presented in Table 2. The largest proportion of Korean respondents were in the age group from 15 to 19, a total of 35.2% of all respondents. The largest proportion of the USA respondents were in the age group from 20 to 29, a total of 37.2% of all respondents. The respondents were unevenly distributed between men and women in USA because female cyclists were difficult to find in New York States.

2. Physical characteristics of the respondents

Table 3 shows the mean physical characteristics of cyclists of both countries. The mean height of Korean female and male cyclists is 161 and 172.8cm, while the mean height of American female and male cyclists is 163.8 and 176.5cm.

By comparing height and weight properties using the Rohrer index, the mean value of Korean male and female cyclists is no differences the mean value of all Koreans in the same age group. The mean value of USA male cyclists is less than the mean value of male serving in the United States Army.

3. Perceptions of bicycle apparel

Perceptions of bicycle apparel means cyclist feel an effect on performance when they cycling.

Table 4 shows the perceived effect of bicycle apparel on performance and the dissatisfaction

Table 2. Distribution of respondents

Age	Korea		USA		Total
	female	male	female	male	
15 – 19	20(45.5)	27(77.1)	1(4.0)	3(7.3)	51(35.2)
20 – 29	15(34.1)	4(11.4)	9(36.0)	26(63.4)	54(37.2)
30 – 39	8(18.2)	3(8.6)	8(32.0)	12(29.3)	31(21.4)
Over 40	1(2.3)	1(2.9)	7(28.0)	0	9(6.2)
Total(%)	44(100.0)	35(100.0)	25(100.0)	41(100.0)	145(100.0)

Table 3. Physical characteristic of the respondents

	Unit	Korea		USA	
		female	male	female	male
Height	inch	63.4	68.0	64.5	69.5
	cm	(161.0)	(172.8)	(163.8)	(176.5)
Weight	pound	120.1	145.7	137.2	158.1
	kg	(54.5)	(66.1)	(62.2)	(71.7)
Rohrer index	cyclists	130.0	128.0	141.6	130.4
	population	(133.2)	(128.1)	(130.7)	(144.7)

Table 4. The perceived effect of bicycling apparel on performance and the dissatisfaction with the bicycle apparel

Items	Korea		USA		Total(%)
	female	male	female	male	
Very much	35(79.6)	13(37.1)	11(44.0)	9(22.0)	68(46.9)
Not much	9(20.5)	21(60.0)	12(48.0)	28(68.3)	70(48.3)
Not at all	0	1(2.9)	2(8.0)	3(7.3)	6(4.1)
I have no idea	0	0	4(16.0)	1(2.4)	5(3.4)
Total(%)	44(100.0)	35(100.0)	25(100.0)	41(100.0)	145(100.0)
χ^2	24.12***	(df=3)			
I don't like the style	12(33.3)	13(43.3)	2(20.0)	0	27(33.8)
It doesn't fit me well	10(27.8)	9(30.0)	8(80.0)	0	27(33.8)
It does not wear well	8(22.2)	2(6.7)	0	2(50.0)	12(15.0)
I don't like feel of the fabric	0	1(3.3)	0	0	5(3.4)
Total(%)	44(100.0)	35(100.0)	25(100.0)	41(100.0)	145(100.0)
χ^2	4.92(N.S)	(df=4)			

(n=145) ***$p \leq 0.001$, N.S=Not significant

with the bicycle apparel. 79.6% and 44% of the female Korean and USA cyclists perceived bicycle apparel had an effect on performance. On the other hand, both Korea and USA male cyclists generally did not feel that bicycle apparel had very much influence on performance. As shown in Table 4, there was significant difference between Korea and USA($P \leq .001$).

Questionnaires on whether or not satisfied with bicycle apparel while bicycling consist of style, fit, wearing, and feeling of the fabric. Most of the male USA cyclists are satisfied with the bicycle apparel they have now, but both male and female Korean cyclists are dissatisfied with bicycle apparel. The reasons that they are dissatisfied with bicycle apparel are that they "do not like the style" and "do not feel the apparel fits well".

Table 5 describes the satisfaction and dissatisfaction related to bicycling jerseys and shorts. The USA cyclists are satisfied with bicycle jerseys. Korean cyclists are dissatisfied with jerseys because the back and waist are pulled up and the waist becomes untucked. 71.4% of Korean male cyclists are satisfied with the sleeve of jerseys. Finally, Korean cyclists are generally less satisfied than America cyclists with bicycling jerseys. So, there are significant differences ($P \leq .01$) between Korea and USA in all of these items.

The male USA cyclists are generally satisfied with the waist band, hip area, and leg area of bicycling shorts. But 66.2% of all respondents are dissatisfied with the crotch area in bicycle shorts. In addition, Korea female cyclists are dissatisfied with the design of the leg of bicycle shorts.

4. The preferred style

Table 6 shows the results of preferred style of bicycle apparel in summer and fall respectively. Among the two-piece style, unitard with sleeves, and unitard without sleeves, 85.6% of all respondents preferred the two-piece style bicycle apparel in summer. In fall, 61.4% of all the respondents preferred the two-piece style bicycle apparel, 25.5% of all respondents preferred the unitard with sleeves. This results shows that most of the respondents preferred the two piece style.

Table 5. Dissatisfaction related to bicycling jersey and shorts

	Items		Korea		USA		Total(%)
			female	male	female	male	
Jersey	The back pulls up	Yes	21(47.7)	20(57.1)	7(28.0)	10(24.4)	58(40.0)
		No	23(52.3)	15(42.9)	18(72.0)	31(75.6)	87(60.0)
		χ^2		10.24**	(df.=1)		145(100.0)
	The sleeve is too broad	Yes	15(34.1)	10(28.6)	3(12.0)	5(12.2)	33(22.8)
		No	29(65.9)	25(71.4)	22(88.2)	36(87.8)	112(77.2)
		χ^2		7.80***	(df.=1)		145(100.0)
	The waist pulls up and becomes untucked	Yes	27(61.4)	16(45.7)	9(36.0)	6(14.6)	48(40.0)
		No	17(38.6)	19(54.3)	16(64.0)	35(85.4)	87(60.0)
		χ^2		15.06***	(df.=2)		145(100.0)
Shorts	The waist-band is pulled down	Yes	15(34.1)	5(14.3)	3(12.0)	9(22.0)	32(22.1)
		No	29(65.9)	30(85.7)	22(88.0)	32(78.1)	113(77.9)
		χ^2		1.06(N.S)	(df.=1)		145(100.0)
	The hip is too tight	Yes	26(59.1)	18(51.4)	4(16.0)	5(12.2)	53(36.6)
		No	18(40.9)	17(48.6)	21(84.0)	36(87.8)	92(63.4)
		χ^2		27.43***	(df.=2)		145(100.0)
	Do you feel any discomfort in the crotch area	Yes	29(65.9)	24(68.6)	18(72.0)	25(61.0)	96(66.2)
		No	15(34.1)	11(31.4)	7(28.0)	16(39.0)	49(33.8)
		χ^2		0.06(N.S)	(df.=1)		145(100.0)
	The short leg hikes up	Yes	23(52.3)	12(34.3)	9(36.0)	6(14.6)	50(34.5)
		No	21(47.7)	23(65.7)	16(64.0)	35(85.4)	95(65.5)
		χ^2		7.41*	(df.=1)		145(100.0)

(n=145) ***$p \leq 0.001$ **$p \leq 0.01$ *$p \leq 0.05$ Yes=Dissatisfaction, No=Satisfaction
N.S=Not significant

As indicated in the Table 6, there is no significant difference in summer and fall.

Table 7 shows the results of preferred style of collar, neckline and sleeve length. In case of collar or neckline, 27.3% of the respondents preferred the round neckline in summer. On the other hand, 60.6% of the respondents preferred the round neckline with stand collar in fall. The preferred style of the collar and neckline was affected by seasons. There is significant difference between Korea and USA cyclists in summer($p \leq .001$).

In case of sleeve length, 59.8 % and 42.4 % of all respondents preferred the short sleeve jersey with set-in sleeve in summer, but 43.2% of all respondents preferred the long sleeve jersey in fall. Some of USA male cyclists were preferred the short sleeve with raglan sleeve in summer. There is no significant difference in preferred sleeve length between Korea and USA.

Bicycle shorts are classified into three types; regular shorts(above the knee), classic knickers(just below the knee) and long leg shorts(to the ankle). Table 8 shows the results of preferred style of shorts length and waist band style. 93.2% of all respondents preferred regular shorts(above the knee) in summer. 40.2% of all respondents preferred long legs shorts(to the ankle) in fall. There is significant difference

Table 6. One piece or two piece (Summer/Fall)

	Korea		USA		Total(S/F)
	female(S/F)	male(S/F)	female(S/F)	male(S/F)	
Two piece	29/19	25/17	21/16	38/29	113(85.6)/81(61.4)
Unitard without sleeves	4/4	5/4	2/1	2/9	13(9.8)/18(13.6)
Unitard with sleeves	0/10	3/12	2/8	1/3	6(4.5)/33(25.5)
Total(%)	33/33	33/33	25/25	41/41	132(100.0)/132(100.0)
χ^2	2.14(N.S)/4.89(N.S)				(df.=2)

(n=132) N.S=Not significant

Table 7. Collar or neckline style and sleeve length (Summer/Fall)

Items		Korea		USA		Total(S/F)
		female(S/F)	male(S/F)	female(S/F)	male(S/F)	
Collor or Neck	Round N.	12/ 1	14/ 4	4/ 2	6/ 3	36(27.3)/10(7.6)
	V shape N.	14/ 1	5/ 1	2/ 0	1/ 0	22(16.7)/ 2(1.5)
	Round N. with knitted C.	2/ 7	4/12	6/ 2	7/ 9	19(14.4)/21(15.9)
	Round N. with stand C.	4/23	9/15	12/19	22/23	17(12.9)/80(60.6)
	V shape N. with shirt C.	1/ 1	1/ 1	1/ 2	5/ 6	8(6.0)/10(7.6)
	Total(%)	33/33	33/33	25/25	41/41	132(100.0)/132(100.0)
	χ^2	32.71***/7.93 (N.S)				(df.=4)
Sleeve Length	Sleeveless jersey	10/ 4	9/ 6	8/ 0	2/ 0	29(22.0)/10(7.6)
	Short S. jersey with set-in S.	20/23	19/24	12/ 1	28/28	79(59.8)/56(42.4)
	Long S. jersey	1/ 6	0/ 3	1/19	0/29	2(1.5)/57(43.2)
	Short S. with raglan S.	2/ 0	5/ 0	4/ 5	11/ 6	22(16.7)/11(8.3)
	Total(%)	33/33	33/33	25/25	41/41	132(100.0)/132(100.0)
	χ^2	5.71 (N.S)/0.26 (N.S)				(df.=3)

N.=Neckline, C.=Collar, S.=Sleeve (n=132) ***$p \leq 0.001$, N.S=Not significant
The total number is different at this table because each item has default values.

between Korea and USA cyclists in fall ($p \leq .001$).

The waist band style is divided into regular waist band with fly zipper, no waist band, elastic waist band and partial elastic waist band. 72.7% and 56.1% of all respondents preferred no waist band on shorts in summer and fall respectively. Some of male Korean cyclists preferred an elastic waist band.

Table 9 shows the results of preferred style of jersey and shorts silhouette. The style of shirt and pants in terms of the ease of movement were divided into two styles. 86.4% and 70.4% of respondents preferred the tight style jersey in summer and fall respectively. 89.4% and 80.3% of respondents preferred tight shorts to loose shorts like regular shorts. In fall, there are significant differences in the preferences of shorts style between Korean and USA cyclists ($P \leq .001$).

V. CONCLUSIONS

To investigate the preferred style of bicycle apparel in Korea and the United States, data were collected using questionnaire between August and October, 1997 in Korea and the U.S. at the same time. The respondents of questionnaires consist of

Table. 8. Shorts length and waist band style (Summer/Fall)

Items	Korea		USA		Total(S/F)
	female(S/F)	male(S/F)	female(S/F)	male(S/F)	
Regular shorts (above the knee)	30/ 6	30/ 7	23/ 3	40/20	123(93.2)/36(27.3)
Classic knickers(just below the knee)	1/12	3/20	2/ 2	1/ 9	7(5.3)/43(32.6)
Long legs shorts (to the ankle)	2/15	0/ 6	0/20	0/12	2(1.5)/53(40.2)
Total (%)	33/33	33/33	25/25	41/41	132(100.0)/132(100.0)
χ^2	2.21(N.S)/15.32***				(df.=2)
Regular waist band with fly zipper	5/12	2/ 4	0/ 0	0/ 2	7(5.3)/18(13.6)
No waist band	20/13	27/18	19/17	30/26	96 (72.7)/74 (56.1)
Elastic waist band	6/ 5	3/10	6/ 7	8/10	23(17.4)/32(24.2)
Partial elastic waist band	2/ 3	1/ 1	0/ 2	2/ 2	5(3.8)/ 7(5.3)
Total (%)	33/33	33/33	5/25	41/41	132(100.0)/132(100.0)
χ^2	8.32(N.S)/13.09(N. S)				(df.=1)

(n=132) *** $p \leq 0.001$, N.S=Not significant

Table. 9. Jersey and shorts style(loose or tight) (Summer/Fall)

Items		Korea		USA		Total(S/F)
		female(S/F)	male(S/F)	female(S/F)	male(S/F)	
Jersey	Loose style jersey	5/ 6	3/18	6/ 6	4/ 9	18(13.6)/39(29.5)
	Tight style jersey	28/27	30/15	19/19	37/32	114(86.4)/93(70.4)
	Total (%)	33/33	33/33	25/25	41/41	132(100.0)/132(100.0)
	χ^2	0.26(N.S)/2.95(N.S)				
Shorts	Tight shorts	30/26	29/19	24/ 24	35/37	118(89.4)/106(80.3)
	Loose shorts	3/ 7	4/14	1/ 1	5/ 3	13(9.8)/25(18.9)
	Total (%)	33/33	33/33	25/25	41/41	132(100.0)/132(100.0)
	χ^2	0.07(N.S)/13.97***				

(n=132) *** $p \leq 0.001$, N.S=Not significant

79 Korean men and women cyclists living in Korea, 66 American men and women cyclists living in the U.S. The total 145 questionnaires were used for data analysis.

The questionnaire consists of general demographics, the perception of bicylcle apparel, and the typical bicycle apparel worn in summer and fall. Data from the survey were analyzed using frequencies and percentiles. The differences between the responses of males and females in Korea and the U.S. from the survey were compared using a χ^2 and Fisher's exact test.

Based on the results from the survey, I concluded as follows:

The mean height of the Korean cyclists was 161 cm and 172.8 cm and the mean height of U.S. cyclists was 163.3 cm and 176.5 cm for females and males respectively. The mean Rohrer height to weight index value of the Korean cyclists is no differences the mean value of all Koreans in the same age group. The mean value of the Rohrer index for the U.S. male cyclists is less than the mean value of male serving in the U.S. Army.

79.6% of Korean female cyclists perceived that bicycling apparel has an effect on performance. Most of the U.S. male cyclists are satisfied, but

both male and female Korean cyclists are dissatisfied with bicycle apparel available to them. The reasons for dissatisfaction with bicycle apparel include 'do not like the style' and 'do not feel the apparel fits well'. Both Korean and American cyclists considered that bicycle apparel are very important role in performance. Among the two-piece style and unitard with & without sleeves, 85.6 % of all respondents preferred the two-piece style of bicycle apparel in summer. In fall, 61.4 % of all the respondents preferred the two-piece style of bicycle apparel, 25.5% of all respondents preferred the unitard with sleeves. Bicycle apparels with different types of collar and neckline were preferred by gender, season, and country. Most of all respondents preferred regular shorts (above the knee) in summer. 72.7 % and 56.1 % of all respondents preferred no waist band on shorts in summer and fall respectively. All respondents preferred fitted jerseys. The data from this study provides the designer with information for creating well designed bicycle apparel.

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