〔보 문〕

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A Study on Wearing Conditions and Dissatisfaction with Current Motorcycle Wear in Korea
-Focus on Men's Motorcycle Jacket-

국내 모터사이클복의 착용실태 및 불만족도에 관한 연구
-남성용 모터사이클 자켓을 중심으로-

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Abstract

본 연구에서는 현재 국내의 서울시내에 거주하는 모터사이클을 타는 만 20세 이상의 남성을 대상으로 모터사이클복에 대한 착용실태와 불만사항들을 조사하고 이를 연령별, 모터사이클 유형별로 비교 분석하여 착용감 및 안전성이 향상된 모터사이클복 개발을 위한 기초자료를 제시하고자 하였다. 설문조사는 2002년 1월~3월까지 3개월간 총 400부를 배부한 후 회수하고, 이 중 262부를 분석자료로 사용하여 빈도 및 백분율, 평균 등의 기술 통계치를 얻어 전반적인 착용현황을 알아보고, 교차분석을 실시한 후 χ^2-검증을 실시하여 연령별, 모터사이클 유형별, 운행경력별로 통계적인 차이를 비교 분석하였다.

1. 모터사이클복의 착용실태 및 불만사항 전반에 관한 조사결과, 조사대상자는 20대~40대의 운행경력은 5년 이상인 전문 라이더들이 많았으며 모터사이클의 배기량은 400cc이상이 가장 높게 나타났고, 모터사이클 유형은 로드 바이크가 가장 높게 나타났고, 이용목적은 레져 · 취미용, 선호하는 모터사이클복 아이템별 소재는 원피스와 슬랙스의 경우에는 피혁소재가 쟈켓의 경우에는 텍스타일 소재가 높게 나타났다. 아이템별 소유는 쟈켓과 투피스가 높게 나타났고, 보호구가 필요하다고 생각되는 신체부위는 상의에서는 가슴과 팔꿈치, 하의에서는 무릎으로 나타났으며, 무릎보호대의 소유도가 가장 높게 나타났다. 모터사이클복 주된 착용목적은 '부상방지', 모터사이클복을 착용하지 않는 이유는 '움직이기가 불편해서' '가격이 비싸서' '여름철에 더워서'가 각각 높게 나타났다. 모터사이클복에 대한 불만족도에서 동작적합성과 사이즈에 대한 불만도가 높게 나타났고, 모터사이클복 소재 및 내부 장착 보호장구의 경량화가 요구되었으며, 모터사이클 쟈켓의 치수부적합부위는 소매길이가 가장 높게 나타났다.

2. 전체 응답자의 연령을 20대, 30대, 40대 이상으로 나누어 연령별 차이를 비교한 결과 각각의 문항에 대해서 모두 연령대별로 유의차가 인정되었다.

3. 모터사이클복 아이템별 선호소재 문항에서 원피스와 쟈켓에서 모터사이클 기종별 유의차가 나타났는데, 비즈니스 기종에서는 텍스타일 소재를, 아메리칸크루져 기종에서는 피혁소재를 선호하였다. 로드바이크와 오프로드 기종에서는 원피스는 피혁소재를 선호하였고, 쟈켓은 텍스타일 소재를 선호하는 것으로 나타났다.

Key words: Motorcycle Wear, Men's Motorcycle Jacket, Protector,
모터사이클복, 남성용 모터사이클쟈켓, 보호구

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I. Introduction

The motorcycle, originally designed in the late 19th century in Germany as a basic two-wheel vehicle[1], has been transformed into a high power (over 1000cc) luxury item manufactured in top-of-the-line models by Harley Davidson of America, Triumph of England, BMW of Germany, and Motto Guzzi of Italy.

The Motorcycle is divided by 'On-road bike' and 'Off-road bike', but recently it is difficult to divide definitely because it is designed to complex concept so that cover several usages. The 'On-road bike' is made for riding on a paved road, the external characteristic is wide tire which has broad ground connection area with surface of land than 'Off-road bike'. American-cruise that is represented by Harley Davidson, Racer replica, Buisiness, Scooter etc. belong to 'On-road bike'. The 'Off-road' is the general term for the bike that make to be apt to run road surface except a paved road, loads narrow tire than on-road' s that there are many projections, big stroke to absorb shock of road surface, wide handle, 'Motor-cross' belongs to this type.

Accordingly, its uses extend from a mode of regular transportation to a form of luxury leisure sport, and as the market has grown, the need for comfortable and functional motorcycle wear, has also grown[2]. In particular, consumers in Germany and Italy recognize the necessity for motorcycle wear and safety equipment. With the popularity of motorcycle racing in Europe, worldwide motorcycle wear brand companies such as Dainese, IXS, Hein Gericke, POLO and so on are leading the market in producing high-quality motorcycle wear, motor-protectors, boots and other accessories. In Korea, in spite of the rise in concerns about safety in motorcycle wear - especially protectors and helmets - there has been a marked increase in express delivery service by motorcycles because of their mobility, promptness, economic advantage, and convenience, as well as an increased appeal as a leisure sport. According to recent national statistics, 1,817,288 motorcycles have been reported[3] in use since January 2001, and among these, about 40,000 were estimated to be used for the transportation business such as express or quick delivery service.[4] Until the mid-1990s motorcycle riders were generally teenagers with limited economic ability, and therefore the motorcycle wear market[5] was also limited. However, during the past ten years, the market has changed to include twenty and thirty-year-olds who use the motorcycle for leisure and sport and regard helmets and specialized wear as important for their safety. Accordingly, it is expected that the scale of the market will continue to rise.[6] In Korea there are no nationally developed brands right now and companies are small compared to those in Europe or Japan. Nevertheless, they have achieved a high quality of needlework and pattern of size fitness in OEM production and their export sales have been reported to have reached $100,000,000 per annum. Accordingly, it behooves the industry to expand this market. But until now, studies on motorcycle wear and protectors have been limited to helmets[7-12], and studies about actual motorcycle wear have been sparse.

This study aims to provide basic information on developing motorcycle wear which has advanced safety features and comfortable fit through research on wearing conditions and current dissatisfaction from national motorcycle riders.

II. Method and Procedure

1. Research subjects and study period

In order to compile information about wearing

conditions and dissatisfaction with motorcycle wear and protectors on the part of current national motorcycle riders, a questionnaire was administered. The questionnaire was compiled based on the results of a preliminary questionnaire, which had been administered one month previously in November 2001. The research subjects were males, over 20 years old, living in Seoul, and motorcycle riders. The questionnaire was circulated for three months from January ~ March 2002 through motorcycle selling agents and in special shops selling motorcycle wear and protectors everywhere in Seoul.

2. Substance of the study

The contents of the questionnaire consisted of population statistics-based questions and common questions related to motorcycles. Respondents were asked questions such as the history of their motorcycle use, displacement, the model of machine, the conditions under which they wore motorcycle gear, reasons for choosing to wear particular items or not, preferred material according to items, size of motorcycle jacket, dissatisfaction with material, dissatisfaction with protection for particular parts of the body, the number and model of items of motorcycle wear and protectors they bought, and what standards they took into consideration when buying such items.

3. Analysis of data

The collected data from the survey on motorcycle wear were analyzed using the descriptive statistics value of frequencies and percentile value, mean, and so on by means of the SPSS WIN.10.0 program. The differences among age groups, motorcycle model groups, and historical operation record groups were compared using the chi-square test. A total of 400 questionnaires were distributed and 262 questionnaires were returned as sources for data analysis, excluding the questionnaires with imperfect responses.

III. Results

1. Questionnaire results on motorcycle wear

General facts about the research subjects indicate that they are men who live in Seoul and have motorcycles (see Table 1).

The historical operation record as shown in Table 2, indicates that over 5 years is the longest with a rate of 48.1%, followed by under 3 years (26.7%), under 5 years (17.6%), and under 1 year (7.6%).

These statistics indicate that questionnaire respondents are professional riders who have been

Table 1. Common facts about research subjects (n=262)

Article	Category	Frequencies(%)	Article	Category	Frequencies(%)
Age	20~29	104 (39.7)	Job	Student	35 (13.4)
				Professional	47 (17.9)
				Clerical worker	28 (10.7)
	30~39	99 (37.8)		Own business man	27 (10.3)
				Salesman	8 (3.1)
				Delivery service worker	25 (9.5)
	Over 40	59 (22.5)		Traffic police	78 (29.8)
				Other	14 (5.3)

Table 2. The result of research related to motorcycle matter (n=262)

Article	Category	Frequencies(%)	Article	Category	Frequencies(%)
Operating record	Under 1 year	20 (7.6)	Model	Scooter	18 (6.9)
	Under 3 years	70 (26.7)		Business(=cub)	17 (6.5)
	Under 5 years	46 (17.6)		American-cruise	38 (14.5)
	Over 5 years	126 (48.1)		Roadbike	124 (47.3)
				Off road	16 (6.1)
Displacement	Under 100cc	15 (5.7)		Other	49 (18.7)
	Under 100~125cc	30 (11.5)	Purpose	For commuting	23 (8.8)
	Under 125~250cc	35 (13.4)		For business	98 (37.4)
	Under 260~400cc	19 (7.3)		For Leisure & Hobby	112 (42.7)
	Over 400cc	163 (62.2)		Other	29 (11.1)

Table 3. The result of research on motorcycle wear

Article	Category	Frequencies(%)	Article		Category	Frequencies(%)
Information Source (n=262)	Visiting store directly	52 (19.8)	Preferred Texture	One-piece style(n=262)	Leather	187 (71.4)
	Catalog and Magazines	68 (26.0)			Textiles	750 (28.6)
	Neighbors	43 (16.4)		Jacket (n=262)	Leather	120 (45.8)
	Internet site	49 (18.7)			Textiles	142 (54.2)
	Motorcycle Club	24 (9.2)		Slacks (n=262)	Leather	137 (52.3)
	Other	26 (9.9)			Textiles	125 (47.7)
The most considered point when buying (n=262)	Size fitness	68 (25.9)	Ownership of motorcycle wear by item	One-piece style(n=262)	Own	45 (17.2)
	Safety	104 (39.7)			Do not own	217 (82.8)
	Design	46 (17.6)		Two-piece style(n=262)	Own	101 (38.5)
	Material	17 (6.5)			Do not own	161 (61.5)
	Color	10 (3.8)		Jacket (n=262)	Own	105 (40.1)
	Other	17 (6.5)			Do not own	157 (59.9)
				Slacks (n=262)	Own	29 (11.1)
					Do not own	233 (88.9)

operating motorcycles for quite a long time. For displacement of motorcycles most commonly in use, over 400cc was the highest with a rate of 62.2%. For the model of motorcycle, the road-bike had the highest points with a rate of 47.3%, and other models included dual purpose, free-style, Sports-naked and so on.

According to the results on motorcycle wear as Table 3 shows, when buying motorcycle wear, 39.7% considered safety as the most important feature, followed by size fitness 25.9%, and design 17.6%.

According to the question focused on preference between leather and textiles for particular items of motorcycle wear, in the case of the coverall style one-piece, leather (71.4%) was rated higher than textile (28.6%), in the case of the jacket, textile (54.2%) was higher than leather (45.8%). And in the case of slacks, leather (52.3%) was higher than textile (47.7%). When looking into the type of motorcycle wear item they had, results indicate that 17.2% have a one-piece coverall, two-piece suits were 38.5%, jackets 40.1%, and slacks 11.1%. Evidently jackets and two-piece suits are the highly

Table 4. Body parts that needs protectors and ownership of protectors Frequenciesr(%)

Body parts / Ranking	Neck	Chest	Back	Pelvis	Knee	Elbow	Waist	Shoulder	Calves	Thigh
1st ranking (n=262)	1(0.4)	58(22.1)	32(12.2)	10(3.8)	108(41.2)	4(1.5)	36(13.7)	10(3.8)	1(0.4)	2(0.8)
2nd ranking (n=262)	0(0.0)	55(21.0)	30(11.5)	12(4.6)	49(18.7)	38(14.5)	40(15.3)	34(13.0)	2(0.8)	2(0.8)
3rd ranking (n=262)	0(0.0)	50(19.1)	8(3.1)	19(7.3)	38(14.5)	55(21.0)	45(17.2)	45(17.2)	0(0.0)	2(0.8)

Protector Ownership	Shoulder Protector (n=262)	Back Protector (n=262)	Elbow Protector (n=262)	Knee Protector (n=262)
Own	69 (26.3)	63 (24.0)	77 (29.4)	174 (66.4)
Do not own	193 (73.7)	199 (76.0)	185 (70.6)	88 (33.6)

preferred items of motorcycle wear.

As indicated in Table 4, research on the parts of the body requiring protectors that can be attached inside or outside of motorcycle wear and which sort of protectors respondents actually have, it is shown that the knee had the highest rate of 41.2%, the second was the chest with a rate of 21.0%, and the third was the elbow with a rate of 21.0%. These results show that riders are most concerned about protecting their lower body part, specifically the knee, followed by the chest and elbow in the upper body part. The majority of respondents(66.4%) answered of any type of protector worn inside or outside of motorcycle wear, the knee protector is most favored, followed by the elbow protector (29.4%), shoulder protector(26.3%), and back protector (24.0%).

As Table 5 shows, to frequency of donning motorcycle wear, respondents said 'always wearing' and 'often wearing' with the highest rates of 37.8% respectively, while 2.8% of respondents said they wear neither protectors nor motorcycle wear. This result implies that because many respondents in this study operate a high displacement motorcycle, have long operating records of over 5 years, and are professional riders in their 20's and 30's, their rate of donning motorcycle wear is also relatively high.

Table 5. Motorcycle wear wearing conditions

Article / Category	Frequencies (n=262)	Percentile Value (%)
Wear always	99	37.8
Wear sometimes	99	37.8
Wear only in special season	28	10.7
Wear only a protector	26	9.9
Never wear	10	3.8

As shown in Table 6 the primary reason for choosing to don motorcycle wear is 'to avoid abrasions' with the highest ranking of 37.4%, the second is 'to protect joints' with 38.2%, and the third is 'for mental stability' with 31.3%. Evidently then, the most significant factor to be taken into consideration when choosing motorcycle wear is to avoid injury. On the other hand, 26.0% of respondents said that they didn' t don motorcycle wear because of 'mobility discomfort.' The second reason is expense with 17.2%; the third is because of overheating in the summer with 16.0%, followed by 'poor sizing' (10.7%), or 'unattractive design' (7.6%). However, it is noteworthy that the differences in ratings were slight, indicating that many reasons must be taken into account. The results concerning dissatisfaction with motorcycle wear according to a five-point standard are shown in Table 7. It is noteworthy that in answer to the question as to whether respondents suffered discomfort of movement when getting on and off a motorcycle while wearing motorcycle wear, 53.8%

Table 6. Reasons to wear or not to wear motorcycle wear

Category \ Article		1st Ranking (n=262)	2nd Ranking (n=262)	3rd Ranking (n=262)
		Frequencies(%)	Frequencies(%)	Frequencies(%)
Reasons to wear	To avoid abrasions	98(37.4)	77(29.4)	25(9.5)
	To protect a joints	80(30.5)	100(38.2)	29(11.1)
	For the mental stability	16(6.1)	25(9.5)	82(31.3)
	To improve mobility function	19(7.3)	7(2.7)	15(5.7)
	To avoid an accident by looking conspicuous	21(8.0)	10(3.8)	39(14.9)
	To keep warm	9(3.4)	24(9.2)	37(14.1)
	To look attractive	10(3.8)	11(4.2)	25(9.5)
	Other	1(0.4)	0(0.0)	2(0.8)
	No answer	8(3.1)	8(3.1)	8(3.1)
Reasons not to wear	Mobility discomfort	68(26.0)	29(11.1)	15(5.7)
	Poor sizing	7(2.7)	28(10.7)	38(14.5)
	Too hot in summer	41(15.6)	32(12.2)	42(16.0)
	Lack of obvious protective benefit	15(5.7)	7(2.7)	10(3.8)
	Expense	25(9.5)	45(17.2)	34(13.0)
	Limited availability	9(3.4)	6(2.3)	6(2.3)
	Unattractive design	2(0.8)	20(7.6)	20(7.6)
	Other	2(0.8)	2(0.8)	4(1.5)
	No answer	93(35.5)	93(35.5)	93(35.5)

Table 7. Dissatisfaction with motorcycle wear (n=262)

Question \ Standard	Very much so	A little so	Normal	Not much	Absolutely not so
When dressed in motorcycle wear, it leads to discomfort when getting off and on the motorcycle	22(8.4)	119(45.4)	65(24.8)	33(12.6)	23(8.8)
When dressed in motorcycle wear, it leads to discomfort when running	10(3.8)	83(31.7)	78(29.8)	69(26.3)	22(8.4)
The position of the protector inside motorcycle wear is not suitable	14(5.3)	51(19.5)	107(40.8)	70(26.7)	20(7.6)
The Size of motorcycle wear is generally too large	24(9.2)	60(22.9)	95(36.3)	64(24.4)	19(7.3)
The Size of motorcycle wear is generally too small	19(7.2)	27(10.3)	106(40.5)	83(31.7)	27(10.3)
The Sizes of motorcycle wear are limited	42(16.0)	79(30.2)	92(35.1)	41(15.6)	8(3.1)
The Weight of motorcycle wear is too heavy	56(21.4)	97(37.0)	75(28.6)	32(12.2)	2(0.8)
Rainwater penetrates the inside of motorcycle wear	21(8.0)	81(30.9)	76(29.0)	73(27.9)	11(4.2)
The material of motorcycle wear is thin and flimsy	14(5.3)	44(16.8)	63(24.0)	108(41.2)	33(12.6)
The stiff material of motorcycle wear causes discomfort	35(13.7)	89(34.0)	75(28.6)	53(20.2)	10(3.8)
Perspiration is not easily absorbed	36(13.8)	91(34.7)	97(37.0)	35(13.4)	3(1.1)
Motorcycle wear does not retain heat well	18(6.9)	63(24.0)	106(40.5)	48(18.3)	27(10.3)
Motorcycle wear is awkward to wash	94(35.9)	77(29.4)	61(23.3)	21(8.0)	9(3.4)

Table 8. Size fitness of motorcycle wear (n=179)

Part of garment / Fitness	Front Length	Back Length	Front Shoulder	Rear Shoulder	Elbow	Front Sleeve	Sleeve Length	Side Length
	frequencies (col%)	frequencies (col%)	frequencies (col%)	frequencies (col%)	frequencies (col%)	frequencies (col%)	frequencies (col%)	frequencies (col%)
Inappropriate Fit	45(25.1)	37(20.7)	57(31.8)	44(24.6)	54(30.2)	39(21.8)	98(54.7)	31(17.3)
Appropriate Fit	134(74.9)	142(79.3)	122(68.2)	135(75.4)	125(69.8)	140(78.2)	81(45.3)	148(82.7)

of total respondents said 'very much so' or 'a little so', indicating a fairly high dissatisfaction rate.

To the question as to whether motorcycle wear was uncomfortable when running, 35.5% of respondents said 'yes', showing their dissatisfaction. In addition, 24.4% of respondents said they felt dissatisfied with the position of the protector. To the questions concerning size fitness, 32.2% of respondents said the size tended to be too big, whereas 17.5% of respondents said it tended to be too small. Also, 46.2% said the sizes were too limited. These results demonstrate that there are no national motorcycle wear brands in Korea and the sizes of the foreign products are unsuitable for Korean consumers. Accordingly, protectors need to be subdivided into various sizes. In the case of motorcycle wear which contains special functional material, the function of the material is very important. Now, to the question concerning whether the material' s weight tended to be too heavy, 58.4% said 'Yes', therefore motorcycle wear material and built-in protectors need to be made more lightweight. As well, 38.9 % of respondents said that motorcycle wear is penetrated by rainwater and 48.5% said perspiration is not easily absorbed, showing high dissatisfaction with the breathing ability and waterproofing capability. To the question as to whether or not there was discomfort because of the stiffness of the material, 47.7% said 'Yes', therefore there is a need to develop lightweight, softer material. Also to be noted is the fact that 30.9% of respondents were dissatisfied with the heat retention capabilities and 65.3% said it was hard to clean.

The appropriateness of size fitness of motorcycle jackets is shown in Table 8 based on the results from 179 subjects who responded that they have either a two-piece or a jacket or both of them in Table 3. Specific dissatisfaction with fit centered on length of sleeve (54.7%), front shoulder (31.8%), elbow (30.2%), the length of the front (25.1%), the rear shoulder (24.6%), the front sleeve (21.8%), the length of the back (20.7%), and the side line (17.3%).

2. Analysis of differences in responses among age groups

After dividing all respondents for this research into categories of 20's, 30's, and over 40's, the differences in responses were compared. The results of preference in material for motorcycle wear according to age groups are shown in Table 9. There is no significant difference in preferred material among age groups for either one-piece or slacks, but for jackets, the 20's group exhibited a higher preference for textiles than the 30's and over 40's groups. The results of ownership of type of garment categorized according to age difference are shown in Table 10. Responses to each question demonstrated differences among age groups. In the case of ownership of the one-piece, the 20's group reported 30.8%, the 30's 9.1%, and the over 40's 6.8%. Clearly, the 20's ownership rate of the one-piece is much higher than the other age groups, and fewer older respondents own that

Table 9. The age difference in preferred material for motorcycle wear

Article	Item	20~29 (n=104)	30~39 (n=99)	over 40 (n=59)
		Frequencies(Col.%)	Frequencies(Col.%)	Frequencies(Col.%)
One-piece style	Leather	72(69.2)	74(74.7)	42(71.2)
	Textiles	32(30.8)	25(25.3)	17(28.8)
	$\chi^2 = 2.373^{N.S}$			
Jacket	Leather	33(31.7)	61(61.6)	26(44.1)
	Textiles	71(68.3)	38(38.4)	33(55.9)
	$\chi^2 = 18.341^{***}$			
Slacks	Leather	47(45.2)	59(59.6)	32(54.2)
	Textiles	57(54.8)	40(40.4)	27(45.8)
	$\chi^2 = 8.610^{N.S}$			

Table 10. Age differences in ownership of motorcycle wear

Article	Category	20~29 (n=104)	30~39 (n=99)	over 40 (n=59)
		Frequencies(Col.%)	Frequencies(Col.%)	Frequencies(Col.%)
One-piece style	Own	32(30.8)	9(9.1)	4(6.8)
	Do Not Own	72(69.2)	91(90.9)	56(93.2)
	$\chi^2 = 22.540^{***}$			
Two-piece style	Own	30(28.8)	41(41.4)	30(50.8)
	Do not Own	74(71.2)	58(58.6)	29(49.2)
	$\chi^2 = 8.243^{*}$			
Jacket (separate)	Own	62(59.6)	38(38.4)	5(8.5)
	Do not Own	42(40.4)	61(61.6)	54(91.5)
	$\chi^2 = 41.186^{***}$			
Slacks (separate)	Own	20(19.2)	6(6.1)	3(5.1)
	Do not Own	84(80.8)	93(93.9)	56(94.9)
	$\chi^2 = 11.707^{**}$			

item. In addition, 50.8% of over 40's possess a two-piece, whereas 41.4% in their 30's, and 28.8% in their 20's. In the case of possessing only the jacket, the results were 59.6% of the 20's group, but 38.4% in the 30's, and 8.5% in the over 40's, so the 20's group one-piece ownership rate is very high. In the case of slacks, the ownership rate was generally low compared to other items, but the 20's group recorded a rate of 19.2%, relatively higher than the other age groups.

Age differences in ownership of each sort of motorcycle protector are shown in Table 11. For all questions except about the back protector, there are some differences visible among age groups. First of all, in the case of the knee protector, it shows a higher ownership rate than the other sorts of protectors over all age groups: 60.6% in the 20's group, 78.8% in the 30's, and 55.9% in the over 40's. The 30's group has the highest ownership rate. Additionally, the shoulder protector is used by 35.6% of respondents in their 20's, 23.2% in their 30's, and 15.3% in their over 40's, therefore older respondents tend to use it less. Further, the elbow protector's ownership rate was 34.6% in their 20's, 32.3% in their

Table 11. Age differences according to ownership of each sort of motorcycle protector

Article	Category	20~29 (n=104)	30~39 (n=99)	over 40 (n=59)
		Frequencies(Col.%)	Frequencies(Col.%)	Frequencies(Col.%)
Knee Protector	Own	63(60.6)	78(78.8)	33(55.9)
	Do Not Own	41(39.4)	21(21.2)	26(44.1)
	$\chi^2 = 11.290^{***}$			
Shoulder Protector	Own	37(35.6)	23(23.2)	9(15.3)
	Do not own	67(64.4)	76(76.8)	50(84.7)
	$\chi^2 = 8.804^{*}$			
Elbow Protector	Own	36(34.6)	32(32.3)	9(15.3)
	Do not own	66(65.4)	67(67.7)	50(84.7)
	$\chi^2 = 7.460^{*}$			
Back Protector	Own	30(28.8)	20(20.2)	13(22.0)
	Do not own	74(71.2)	79(79.8)	46(78.0)
	$\chi^2 = 2.244^{N.S.}$			

30's, and only 15.3% in their over 40's.

The itemized differences in age groups according to whether or not the respondents don motorcycle wear are shown in Table 12. In the case of 'always wearing', the results of 29.8% in the 20's group, 38.4% in the 30's, and 50.8% in the over 40's, demonstrate that the older respondents are most likely to wear such items. On the other hand, responses indicating 'only wearing the protector' range from 18.3% in the 20's group, and 4.0% in the 30's, to 5.1% in the over 40's.

Table 13 categorizes dissatisfaction with motorcycle wear by age. Clear differences are apparent: first in terms of reduced mobility when getting on/off, 55.7% of the 20's group, 54.5% of the 30's, and 49.2% of the over 40's answered 'inconvenient,' ('very much so,' 'a little so') - which means older people feel more inconvenienced though the difference in age is relatively minor. To the statement concerning size being too large, 36.3% of the 30's answered in the affirmative ('very much so,' 'a little so') as did 34.6% of the 20's and 16.9% of the over 40's. In addition, 61.7% of the 30's group, 42.3% of the 20's, and 27.2% of the over 40's expressed dissatisfaction with the range of sizes. Generally, the 30's group expressed the highest degree of dissatisfaction. In terms of motorcycle wear being too heavy, 70.7% of the 30's group answered 'very much so,' 'a little so' - noticeably higher than the 54.2% in their 40's

Table 12. Age differences relative to frequency of donning motorcycle wear

Article	20~29 (n=104)	30~39 (n=99)	Over 40 (n=59)
	Frequencies(Col.%)	Frequencies(Col.%)	Frequencies(Col.%)
Wear always	31(29.8)	38(38.4)	30(50.8)
Wear sometimes	42(40.4)	39(39.4)	18(30.5)
Wear only in special season	7(6.7)	16(16.2)	5(8.5)
Wear only a protector	19(18.3)	4(4.0)	3(5.1)
Never wear	5(4.8)	2(2.0)	3(5.1)
$\chi^2 = 23.573^{**}$			

Table 13. Age differences relative to dissatisfaction with motorcycle wear

Article	Category	20~29 (n=104)	30~39 (n=99)	Over 40 (n=59)
		Frequencies(Col%)	Frequencies(Col.%)	Frequencies(Col.%)
When dressed in motorcycle wear, it leads to discomfort when getting off and on the motorcycle	Very much so	7(6.7)	12(12.1)	3(5.1)
	A little so	51(49.0)	42(42.4)	26(44.1)
	Normal	26(25.0)	26(26.3)	13(22.0)
	Not much	13(12.5)	15(15.2)	5(8.5)
	Absolutely not so	7(6.7)	4(4.0)	12(20.3)
	χ^2 = 16.858*			
The Size of motorcycle wear is generally too large	Very much so	3(2.9)	13(13.1)	6(10.2)
	A little so	33(31.7)	23(23.2)	4(6.8)
	Normal	31(29.8)	38(38.4)	28(47.4)
	Not much	26(25.0)	19(19.2)	19(32.2)
	Absolutely not so	11(10.6)	6(6.1)	2(3.4)
	χ^2 = 31.637**			
The Sizes of motorcycle wear are limited	Very much so	9(8.7)	25(25.3)	8(13.6)
	A little so	35(33.7)	36(36.4)	8(13.6)
	Normal	41(39.4)	26(26.3)	25(42.4)
	Not much	16(15.4)	7(7.0)	18(30.5)
	Absolutely not so	3(2.9)	5(5.0)	0(0.0)
	χ^2 = 35.817***			
The Weight of motorcycle wear is too heavy	Very much so	15(14.4)	28(28.3)	11(18.6)
	A little so	34(32.7)	42(42.4)	21(35.6)
	Normal	39(37.5)	19(19.2)	17(28.8)
	Not much	16(15.4)	8(8.1)	8(13.6)
	Absolutely not so	0(0.0)	2(2.0)	2(3.4)
	χ^2 = 24.652**			
Rainwater penetrates the inside of motorcycle wear	Very much so	3(2.9)	10(10.1)	8(13.6)
	A little so	37(35.6)	29(29.3)	15(25.4)
	Normal	32(30.8)	32(32.3)	12(20.3)
	Not much	23(22.1)	26(26.3)	24(40.7)
	Absolutely not so	9(8.7)	2(2.0)	0(0.0)
	χ^2 = 22.936**			
Perspiration is not easily absorbed	Very much so	8(7.7)	19(19.2)	7(11.9)
	A little so	44(42.3)	39(39.4)	8(13.6)
	Normal	42(40.4)	31(31.3)	26(44.0)
	Not much	8(7.7)	9(9.1)	18(30.5)
	Absolutely not so	2(1.9)	1(1.0)	0(0.0)
	χ^2 = 41.558***			
Motorcycle wear does not retain heat well	Very much so	4(3.8)	8(8.1)	4(6.8)
	A little so	31(29.8)	21(21.0)	11(18.6)
	Normal	40(38.5)	44(44.0)	24(40.7)
	Not much	25(24.0)	11(12.0)	12(20.3)
	Absolutely not so	4(3.8)	15(15.2)	8(13.6)
	χ^2 = 19.388*			
Motorcycle wear is awkward to wash	Very much so	26(25.0)	46(46.5)	21(35.6)
	A little so	33(31.7)	34(34.3)	11(18.6)
	Normal	31(29.8)	11(11.1)	19(32.2)
	Not much	14(13.5)	5(5.1)	2(3.4)
	Absolutely not so	0(0.0)	3(3.0)	6(10.2)
	χ^2 = 39.451***			

Table 14. Different preferences in materials for motorcycle wear and ownership of motorcycle wear and protector according to type of motorcycle

Article		Type	Scooter (n=18)	Business (n=17)	American cruise (n=38)	Road bike (n=124)	Off road (n=16)	Other (n=49)
			Frequencies (Col%)	Frequencies (Col%)	Frequencies (Col%)	Frequencies (Col%)	Frequencies (Col%)	Frequencies (Col%)
Preferred material by item	One-piece style	Leather	15(83.3)	4(23.5)	36(94.7)	80(64.5)	12(75.0)	41(83.7)
		Textiles	3(16.7)	13(76.5)	2(5.3)	44(35.5)	4(25.0)	8(16.3)
			$\chi^2 = 38.704^{***}$					
	Jacket	Leather	6(33.3)	6(35.3)	28(73.7)	44(35.5)	5(31.3)	31(63.3)
		Textiles	12(66.7)	11(64.7)	10(26.3)	80(64.5)	11(68.8)	18(36.7)
			$\chi^2 = 26.487^{***}$					
	Slacks	Leather	6(33.3)	8(47.1)	22(57.9)	61(49.2)	7(43.8)	34(69.4)
		Textiles	12(66.7)	9(52.9)	16(42.1)	63(50.8)	9(56.3)	15(30.6)
			$\chi^2 = 13.274^{N.S}$					
Ownership of motorcycle wear by item	One-piece style	Own	0(0.0)	1(5.9)	4(10.5)	32(25.8)	5(31.3)	3(6.1)
		Do not own	18(100.0)	16(94.1)	34(89.5)	92(74.2)	11(68.8)	46(93.9)
			$\chi^2 = 19.367^{**}$					
	Two-pieces style	Own	5(27.8)	4(23.5)	19(50.0)	43(34.7)	8(50.0)	22(44.9)
		Do not own	13(72.2)	13(76.5)	19(50.0)	81(65.3)	8(50.0)	27(55.1)
			$\chi^2 = 7.108^{N.S}$					
	Jacket	Own	6(33.3)	6(35.3)	12(31.6)	70(56.5)	4(25.0)	7(14.3)
		Do not own	12(66.7)	11(64.7)	26(68.4)	54(43.5)	12(75.0)	42(85.7)
			$\chi^2 = 30.577^{***}$					
	Slacks	Own	2(11.1)	3(17.6)	1(2.6)	15(27.8)	5(31.3)	3(6.1)
		Do not own	16(88.9)	14(82.4)	37(97.4)	109(87.9)	11(68.8)	46(93.9)
			$\chi^2 = 11.467^{*}$					
Ownership of motorcycle protectors by item	Knee Protector	Own	9(50.0)	12(70.6)	26(68.4)	86(69.4)	13(81.3)	28(57.1)
		Do not own	9(50.0)	5(29.4)	12(31.6)	38(30.6)	3(18.8)	21(42.9)
			$\chi^2 = 6.323^{N.S}$					
	Shoulder Protector	Own	6(33.3)	5(29.4)	0(0.0)	41(33.1)	12(75.0)	5(10.2)
		Do not own	12(66.7)	12(70.6)	38(100.0)	83(66.9)	4(25.0)	44(89.8)
			$\chi^2 = 43.121^{***}$					
	Elbow Protector	Own	8(44.4)	5(29.4)	8(21.1)	37(29.8)	11(68.8)	8(16.3)
		Do not own	10(55.6)	12(70.6)	30(78.9)	87(70.2)	5(31.3)	41(83.7)
			$\chi^2 = 19.225^{**}$					
	Back Protector	Own	2(11.1)	1(5.9)	4(10.5)	38(30.6)	11(68.8)	7(14.3)
		Do not own	16(88.9)	16(94.1)	34(89.5)	86(69.4)	5(31.3)	42(85.7)
			$\chi^2 = 31.543^{***}$					

and 47.1% in their 20's. Each group showed about the same degree of dissatisfaction with the rain-proofing capabilities: 40.2% of the 30's, 38.5% of the 20's and 39.0% of the 40's answered 'very much so,' 'a little so'. In addition, 58.6% of the 30's were dissatisfied with the perspiration absorption

capabilities; it was higher than the 50.0% in the 20's and 25.5% in the over 40. Younger respondents had more complaints about the degree of warmth: 33.6% of the 20's, compared to 29.1% of the 30's and 25.4% of the over 40's. Dissatisfaction with the washing capabilities was highest in the 30's group at 80.8%, followed by 56.7% of the 20's, and 44.2% of the over 40's. Table 14 shows preferred fabrics for motorcycle wear and ownership statistics for motorcycle wear and protectors. Except for the case of slacks in 'Preferred material by item,' there were definite differences for one-pieces and jackets. Respondents who owned business machines showed a preference for textiles (one-piece 76.5%, jacket 64.7%) for all motorcycle wear items American-cruise owners preferred leather (one-piece 94.7%, jacket 73.7%). Additionally, it appears that road-bike and off-road users prefer leather for the one-piece, but prefer textiles for the jacket. In terms of seeing whether the ownership of motorcycle wear is related to the type of motorcycle, respondents answered differently for all articles except the two-piece. The most popular motorcycle type was off-road(31.3%), and many owners are equipped with a jacket(56.5%), and slacks(31.3%).

In terms of the types of protectors, more off road riders have a knee protector(81.3%), followed by business riders (70.6%). As well, 75.5% of off road riders have protectors, as do 33.3% of scooter riders and 33.1% of road-bike riders. In addition to that, 68.8% of off road riders are equipped with shoulder protectors, as are 44.4% of scooter riders. Moreover, 68.8% of off road riders have back protectors, followed by road-bike riders(30.6%).

IV. Conclusion

The purpose of the study was to provide basic information on developing national motorcycle wear with advanced safety features and more suitable fit.

The results of this study were as follows:

1. Results of research on wearing conditions and discontent with motorcycle wear

49.1% of the questionnaire had been using a motorcycle for more than five years, and so seemed to be relatively experienced riders. As well, 62.2% of them used motorcycles with over 400cc displacement, and 47.3% of them had a road-bike type of motorcycle. More respondents answered for leisure and sport, business use, other, or for commuting to work to the question asking their purpose of use. And to the question asking whether they preferred leather or textiles as material for motorcycle wear, the respondents preferred leather in the case of the coverall style one-piece and slacks, but textiles for jackets. The jacket was the most preferred item for motorcycle wear. Also, the respondents indicated they needed a protector for knees mostly, and then for chest and elbows. There were a number of reasons why the respondents chose to wear motorcycle wear or not ; the first reason (31.3%) was 'to protect themselves from abrasions,' the second 'to protect joints,' and the third was 'to have a sense of security'. On the other hand, as reasons for choosing not to wear, the first was 'difficulty with mobility', the second 'expense', and the third 'it's too hot to wear in summer.' Since respondents' answers to the questions were varied, the results revealed that they have a wider range of reasons for choosing not to wear it than to wear it. Therefore, the greatest dissatisfaction with motorcycle wear seemed to be connected to mobility, Respondents also reported that too large sizes are a problem since most of motorcycle wear items are imported from abroad, normally Europe.

Therefore respondents would clearly prefer for domestic manufacturers to make motorcycle wear in varied sizes. In terms of fit, the areas causing most dissatisfaction were: the shoulder and elbow, as well as the sleeve, jacket, and side length. Complaints about the materials were concerned with heaviness, stiffness, lack of breathing ability, and waterproofing.

2. Analysis of age differences in motorcycle wear and particulars about motorcycles

In terms of preference in type of material of itemized motorcycle wear, the 20's group preferred textile materials more than did the 30's and over 40's for motorcycle jackets. The most commonly worn protector was the knee protector in the 30's, and in the case of shoulder protectors, the ownership rate fell in accordance with the increase in age. In the analysis of dissatisfactions with motorcycle wear, it was revealed that younger riders are more conscious of inconvenience in getting on/off a motorcycle while the 30's group were more dissatisfied with the limited size options.

3. Analysis of the differences in preferred material, ownership of motorcycle wear and protectors according to type of motorcycle. There were some differences in the likelihood of owning a coverall style one-piece and jacket depending on the type of motorcycle. It seemed as if business riders prefer textiles while American-cruise riders prefer leather. Road-bike riders and off-road riders prefer leather for the one-piece, but they prefer textiles for the jacket. Excepting the case of knee protectors, there were some differences in their answers to the question about different items such as shoulder protector, elbow protector, back protector according to type of motorcycle.

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