

Chapter 15

Morphological Constitution of Smokers

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Chapter 15

MORPHOLOGICAL CONSTITUTION OF SMOKERS

PHYSIQUE OF SMOKERS

Several studies deal with the relation of morphological constitution and smoking. In 1929 Diehl (2) reported a study of the physique of smokers as compared to non-smokers in a group of freshmen at the University of Minnesota. Measurements of height and weight were obtained at the time of the freshman entrance examination, and smoking habit was determined from a questionnaire item based simply on whether the student did or did not smoke. No significant differences were found in height, weight, and height/weight ratio between the 445 smokers and 441 non-smokers. However, the design of the study limits the reliability of the information.

SOMATOTYPE CLASSIFICATION

A more satisfactory but still limited study was reported by Parnell (41) in 1951. Using Sheldon's somatotyping technique, Parnell contrasted the classifications of smokers and non-smokers of 308 Oxford undergraduates. In smokers the most frequent somatypes were the dominant endomorphs and endomorphic mesomorphs; the least frequent was the dominant ectomorph, with the dominant mesomorph in the middle. For the non-smokers the most frequent somatype was the dominant ectomorph, and the mesomorphic ectomorph; the least frequent were the endomorphs and the endomorphic mesomorphs, and again the dominant mesomorphs were in the middle.

MASCULINITY

In 1959 Seltzer (5) presented information on the relationship between physical masculinity and smoking in a group of 247 Harvard College students who had been followed for more than 15 years for smoking habits, as well as other information. From the smoking data, the subjects were classified into three groups, non-smokers, moderate smokers and heavier smokers. When the subjects were sophomores, they were rated with respect to a body-build complex known as the masculine component, which referred to the element of masculinity as indicated by external morphological features. In measuring this element, the more the pattern of anatomical traits tends

toward the extreme masculine form, the stronger is the masculine component; the greater the departure from the extreme masculine type towards the feminine build, the weaker is the masculine component. The results of this study showed a statistically significant association between the strength of the masculine component and smoking habits. More specifically, it was found that weakness of the masculine component is significantly more frequent in smokers than in non-smokers, and most frequent in heavier smokers. Furthermore, it was indicated that the subjects with weakness of the masculine component showed a constellation of personality and behavioral traits that were, for the most part, not inconsistent with the findings of Heath (3) in his study of the differences between smokers and non-smokers. Although these findings were suggestive, they were recognized by the author as being preliminary and tentative in nature and requiring further confirmation. Furthermore, the series on which these results were obtained was relatively small and represented a highly selected population.

BODY WEIGHT

Thomas (7), in her study of precursors of hypertension and coronary artery disease in more than 1,000 students at The Johns Hopkins University School of Medicine compared the group of non-smokers with the group of smokers for body weight among other characteristics. The group of 297 non-smokers included occasional smokers as well, and the 321 smokers included all smokers except non-smokers, occasional, ex-smokers, and unknown. Pipe, cigar, and mixed smokers were included in the smoker category. The relationship of body weight to smoking habits was analyzed on the basis of percentage of overweight and underweight calculated from standard tables.

Thomas found the percentage distribution of overweight and underweight was similar for smokers and non-smokers except at the upper end of the distribution curve. There was an excess of smokers who were 30 percent or more overweight, and the subjects who were 40 percent or more overweight were all regular smokers. The non-smokers had also a greater frequency of individuals with 10 percent or more underweight than the smokers. The difference between smokers and non-smokers with regard to this body weight classification was found to be statistically significant. The subjects were also compared for the ponderal index (height over the cube root of weight), with the smokers showing an excess of the unusually heavy body builds.

In the introduction to her paper on the characteristics of smokers compared with non-smokers (of which the weight analysis was a part), Thomas wrote: "The finding that smokers, especially heavy smokers, have a higher mortality rate from coronary heart disease than do non-smokers makes it important to determine whether those who smoke are fundamentally different from those who do not smoke, or whether smokers and non-smokers are essentially alike. If alike, then smokers and non-smokers may be considered as a single population with a uniform life expectancy. If, however, smokers have constitutional differences from non-smokers, the two groups might have

inherently different mortality rates, and one group could not serve as a control for the other in statistical studies." After detailing the significant differences noted in her data between smokers and non-smokers, with regard to history of parental hypertension, heart rate, pulse pressure, body weight, and other variables, Thomas concluded that "It cannot be determined from the present data whether those individual characteristics which are more often found among smokers than non-smokers represent true constitutional differences or are due to the effects of smoking. The differences observed in the parental histories indicate that smokers and non-smokers have a somewhat different heritage, and suggest that at least some of the variations found in individual traits may be genetic in origin."

In a study of 167 adult male factory workers of Neapolitan parentage but of American birth and upbringing, Damon (1) reported on morphological correlates with smoking. The original series contained 213 volunteers but 46 dropped out for various reasons, and the age range was most extensive from 20 to 59 years of age. Damon's non-smoker category consisted of subjects not currently smoking and had never been regular smokers. Cigar and pipe smokers were combined with cigarette smokers, and the statistical analysis was based on the biserial correlation coefficient.

As a result of his analysis, Damon found that smoking was associated at the 5 percent level with bi-iliac/biacrominal breadth, subscapular skinfold, ectomorphy, and physical activity; and at the 1 percent level with weight, height/cube root of weight, endomorphy and somatotype group. Smokers of all grades had very similar levels of activity. On the other hand, the most active and the least active men smoked more than those of average activity--a finding which reflects a curvilinear regression of smoking on activity. Damon concludes: "The results show a consistent and significant tendency . . . for lean men to smoke more than stout or fat (but not muscular) men . . . higher cholesterol levels among smokers contrary to findings previously reported, smokers in this series were no less masculine in physique, were no more active and consumed no more alcohol than non-smokers."

PROSPECTIVE STUDIES

The most extensive study of morphology as related to smoking habits is Seltzer's prospective study of 922 Harvard alumni 13 years out of college, whose physical characteristics were recorded when they were undergraduates (6). The investigation was concerned with the morphological characteristics of different classes of non-smokers, cigarette smokers, pipe smokers, and cigar smokers, in a selected male population in order to ascertain the extent to which different smoking classes are phenotypically and genotypically conditioned. The morphological material consisted of a series of anthropometric measurements taken in the fall of 1942 as part of the routine Harvard College medical examination. A total of 12 measurements were obtained of various parts of the body, from which 10 body ratios or indices were computed. When the morphologic data were collected, there was no

prior consideration or knowledge of their ultimate use in this correlative study with the subjects' subsequent smoking histories. Information with respect to the smoking habits of these Harvard men was obtained in the fall of 1959 through the medium of a questionnaire (81 percent response). The questionnaire covered approximately 16 years of smoking history and the subjects at the time of completing the questionnaire averaged 35 years of age, a period of maximum lifetime smoking experience. As far as smoking categories are concerned, an attempt was made to obtain groupings as precisely differentiated as possible. The primary classification separated the subjects into non-smokers and smokers. The non-smoker was defined as a person who had never smoked at all or had attempted an occasional smoke during his lifetime. Individuals who smoked occasionally but not every day were excluded from the non-smoker category. The smokers were subdivided into exclusive groupings of cigarette only, cigar only, and pipe only in accordance with the form of tobacco used. AU who regularly used more than one form of tobacco were omitted from this particular classification. For the analysis of degree or rate of cigarette smoking, there was a breakdown into five subgroups from occasional to 2+ packs a day. The prospective nature of the study, with the availability of the physical measurements made during the college years, had the special advantage of representing a level of morphological status undifferentiated by individual variations resulting from modes of habit, diet, physical activity, health and disease of the subsequent adult years. The analysis was divided into three parts: comparison of non-smokers and smokers, variations among smokers according to form of smoking, and variations among smokers as related to degree or rate of smoking.

The comparison of 234 non-smokers and 688 smokers showed that the two groups were significantly differentiated both in morphologic dimensions and proportions. In every instance, the smokers had larger mean dimensions than the non-smokers, and in all but one instance these differences were statistically significant. Smokers were consistently greater than non-smokers in height, weight, and in the dimensions of the head, face, shoulders, chest, hip, leg, and hand. Similarly, the smokers of cigarettes only, pipes only, and cigars only had larger mean dimensions than those of the non-smoker category. In addition, in eight out of ten bodily indices or proportions the smoker types showed mean deviations from the non-smoker that were all in the same direction and indicative of the same trend. A consistent graded pattern of differentiation into a specific order of arrangement of non-smokers, cigarette only, pipe only, and cigar only smokers, in that order, was found. Thus, for example, in the case of weight, the cigarette only smokers were 4.37 pounds heavier than the non-smokers, the pipe only smokers 6.59 pounds heavier, and the cigar only smokers 10.41 pounds greater mean body weight. Analysis of the data dealing with amount of cigarette smoking did not show a regular significant body build differentiation according to rate or degree of smoking, but there were suggestions of a positive linear trend from the lightest smoking category to the "1 to 2 packs daily" followed by a downward trend of the maximum "2+ packs daily" smokers.

Of all the morphological studies, this prospective study appears to present the best data available. Nevertheless, the Harvard students comprise a highly selected sample.

CONCLUSION

The available evidence suggests the existence of some morphologic differences between smokers and non-smokers, but is too meager to permit a conclusion.

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