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Smoking as Behavior: Applying a Social Psychological Theory*

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Because current theoretical approaches to the study of smoking behavior have variously defined the nature of the dependent variable, have been characterized by limited generalizability, and lack continuity with general social psychological theory, a new perspective is presented. The new model is drawn from the study of the educational and occupational attainment process and views smoking as a behavior determined by an informational construct, i.e., attitude. The applicability of this model is discussed, then empirically tested by reference to a survey of 97 undergraduates and their agents of interpersonal influence. The results of this study are examined as to the applicability of the theoretical model and the implications of the approach for the formation of smoking policy.

IN recent years, the evidence suggesting multiple health hazards of smoking has had effects in a number of areas. It has prompted even greater research on the clinical features of smoking behavior to determine the nature and extent of the physiological dangers of smoking and, in the area of health policy, planners have been prompted to take positive action toward reducing cigarette smoking. These actions usually take the form of consumer education, but also involved the establishment of "smoking withdrawal" clinics and related programs.

A significant portion of the program designed to induce smoking cessation involve a medical or quasi-medical therapeutic approach. Techniques relying on "doctor's orders," tranquilizers, placebos, etc. have been repeatedly employed. Although over one hundred methods of smoking control have been utilized and studied, there is little evidence to suggest that any single technique or any class of techniques is particularly effective in inducing long-term changes in the smoking behaviors of volunteer subjects (Schwartz, 1969).

The failure of these medical and clinical

approaches to induce significant changes in smoking behaviors strongly suggests that the causes of smoking behavior are essentially nonmedical and not subject to "treatment" in the traditional sense of the term. As this has become increasingly evident, investigators have turned to psychologists and social scientists for guidance. Advice on methods of behavior modification is something social scientists are never without, and in the specific instance of cigarette smoking, they have presented techniques that rely on: (1) behavioral conditioning (Wilde, 1964); (2) group discussion; (3) counseling (Schwartz and Dubinsky, 1968); (4) hypnosis (von Dedenroth, 1968); (5) interpersonal communication (Janis and Mann, 1965); and (6) self-analysis (Horn, 1967).

Each of these approaches suggests that smoking behavior is the result of some finite set of social and psychological variables, yet none has either demonstrated any significant powers in predicting the smoking behaviors of an individual or led to techniques of smoking control that, considered alone, have significant long-term effects.

The failure of the social sciences to date in providing clear evidence of the social or psychological roots of smoking behavior may be traced to three areas of difficulty. First, there has been no clear conception of

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the dependent variable being analyzed. Some investigations have employed as their dependent variable "success" and "failure" in quitting smoking (Graham and Gibson, 1971), while others examined the opposite process of susceptibility or resistance to the initiation of smoking, (Kahn and Edwards, 1970). Still others have conceived the problem as one of identifying *differences* between "smokers" and "non-smokers" as a state of being (Zagona, 1968). As a result, this field of study has been divided into distinct realms of research in which the theories and findings of one investigation are not applied in others. Those theories used to explain why individuals start smoking are not applied to the study of the continuation or cessation of the behavior. Theories of smoking cessation are just that, having only oblique relevance to smoking initiation. This unfortunate state of the art is reflected in the conclusion of the 1964 Surgeon General's Report on smoking that: "Less is known about discontinuation than about beginning of smoking, although there is good evidence that it is related to the beginning of the habit, its nature and duration." (Surgeon General, 1964:377).

The second major difficulty in the social-psychological study of smoking behavior lies in the fact that each theoretical approach has utilized an admittedly narrow range of variables. Theories of mass communication tend to ignore the effects of the social situation or context of the smoking act (Gibson, 1971), attitudinal approaches tend to neglect the effects of social structure, and so on. While no one denies that the variables that play upon the individual are multiple and diverse, no investigation has provided a means whereby the effects of several different forms of influence may be examined simultaneously.

Finally, the study of smoking behavior has been approached as though cigarette smoking had little continuity with other kinds of social acts. Given the attention that has been spent on smoking behavior by investigators having medical and clinical backgrounds, and the evidence pointing to the medical effects of smoking behavior, it seems to have been erroneously presumed that the behavior itself stems from medical sources. This has contributed to some con-

fusion in the study of smoking. Because this medical aspect *seemed* so relevant, theories that may be applicable to non-medical social acts have not been thoroughly considered with reference to cigarette smoking.

Theory

In light of these difficulties of previous studies of smoking behavior, new theoretical initiatives appear warranted. However, if such new contributions are to clarify rather than confuse research, they must: (1) employ a widely interpretable dependent variable applicable to the study of smoking initiation, continuation, and cessation; (2) bring together diverse social, structural, and psychological variables; and (3) have some continuity with a broader realm of social-psychological inquiry.

With regard to the first issue it is contended that cigarette smoking is a behavior most importantly characterized in terms of a *rate* of behavior. We are concerned with the individual insofar as his behavior reflects a rate of smoking or a pattern of a rate. That rate may be low to the point of zero (e.g., a nonsmoker) or high (e.g., a chain smoker), and it may be uniform or variable. Its decrease represents the cessation process, while its increase from zero may be taken to represent the initiation process. Its stability may be considered resistance to change, while its variability may be conceived as the smoker's susceptibility to change. In terms of this one variable alone we may meaningfully discriminate among a variety of empirical phenomena of interest. It provides a common dimension in terms of which smokers, nonsmokers, successful quitters, and failures may be comparably examined.

Conceptualizing our dependent variable in this fashion suggests that the independent variables of consequence are those (any and all) that affect the rate of behavior. Previous research suggests a variety of such variables, including: the smoker's own wishes with regard to his behavior, i.e., a desire to smoke or a desire to quit, as well as his beliefs with respect to other issues, such as his fear of the health consequences of smoking (cf. Borgatta and Evans, 1968). In addition to these attitudinal components,

research has suggested the importance of a variety of sources of interpersonal influence (McRae and Nelson, 1971) as well as mass media (Ward, 1971). Other research suggests that the individual's reaction to the smoking experience itself may play a role in the determination of his smoking behavior (Frith, 1971). In addition to these social-psychological variables, numerous investigators have noted a relationship between the age and sex of the subjects and their smoking behavior.

To facilitate the joint examination of this diverse range of independent variables in a manner consistent with that employed in other areas of investigation, we may employ a theoretical perspective recently outlined by Woelfel and Haller (1971). In their study of the educational and occupational attainment process they examine an equally wide range of variables, including: (1) the attitudes of the individuals; (2) other related attitudes; (3) significant other influence; (4) relevant phenomenal reality; and (5) structural factors. They argue that the first of these (the subjects' aspiration attitudes) exerts direct causal influence on subsequent behavior (the attainment), while the remaining four variables affect the formation of the attitude insofar as they provide, filter, or control *information*. It is argued that attitudes are solely formed by such information processes and that in this sense information may be viewed as a "motor force" towards behavior.

The Woelfel and Haller model appears to satisfy the three criteria suggested earlier and there is at least a superficial resemblance between the variables important in the aspiration formation process and those relevant to smoking behavior. The applicability of the model to the problem of predicting rates of smoking will be examined in greater detail. This review is conducted to determine whether the model may be made relevant to the issue of cigarette smoking. Whether such a model can marshal empirical support in application to the problem is considered later.

The Woelfel—Haller model will be reviewed only insofar as it seems pertinent to smoking behavior. For a detailed description of their work as applied to the educational and occupational attainment process,

the reader is urged to examine the original work.

The Variables

The dependent variables. As noted earlier, the principle dependent variable is conceptualized as a rate of cigarette smoking. This variable is conceived as a continuous one, measured by observing some quantity or activity over some increment of time. A practical unit of measure might be as small as a cigarette puff over a period of time as long as a life-time. However, given the limited measurement tools of the social scientist, a more realistic unit of measure is the number of cigarettes smoked per day. Higher values of this variable are taken to reflect greater engagement of the individual in smoking behavior.

The Smoking Attitude. For those behaviors expressed as a rate, there exists on the part of the individual a belief having the form of a *projected* rate of behavior. That is, the smoking individual maintains a conception of a rate of smoking appropriate to himself. He believes, for example, that he is the kind of person, like it or not, who smokes "a pack a day" or is an "occasional smoker." This attitude is comparable in form to our descriptions of the behavior itself and is measurable in terms of the same scale applied to the behavior. Woelfel and Haller argue that, in the educational and occupational attainment process, attitudes of this nature exert causal influence on the behavior. Applied to the case of cigarette smoking, it seems probable that the smoking attitude (as a projected rate of behavior) would affect the actual rate of behavior.

Other Related Attitudes. In addition to the specific smoking attitude as a projected rate of behavior, there exist related attitudes that may exert influence on the smoking attitude. These related attitudes act as the means whereby a diverse range of information is made relevant to the actual behavior. In the case of educational aspiration, examples of these other related attitudes include the individual's conception of the "benefits" of education or the importance of the "social life" related to the educational experience. In the instance of cigarette

smoking, relevant attitudes might logically include the individual's recognition of the health threat posed by smoking, and the beliefs that cigarette smoking is or is not a gratifying experience, that cigarette smoking is inconvenient or costly, and that cigarette smoking has some effect on one's social life by making one more or less popular among his peers. As these attitudes vary in strength, so too would we expect the individual's projected rate of smoking to vary, making smoking a more or less desirable or acceptable behavior to the individual.

Significant Others' Influence. Substantial previous research in the study of smoking initiation has suggested that certain individuals, by virtue of their own smoking behavior, their own attitudes toward smoking and their verbalization regarding smoking behavior, have effects on the smoking attitudes and behaviors of others. In the study of occupational attainment, these concepts appear in the form of the attainments of "models" (people to whom others refer to as *exemplars* of behavior), the aspirations of models, and the "expectations" of *definers* (those who actually speak to others about attainments or attainment related issues). All of these individuals, be they models or definers, are, insofar as they influence the aspiration attitudes of some focal individual, "*significant others*."

In the case of cigarette smoking, the behavior of models, the attitudes of models, and the expectations of definers seem particularly important. Each of these three forms of influence may be conceptualized in the same manner as was done in the case of the smoking individual's behavior and attitudes. The significant other's behavior is his rate of smoking, his attitude is a *projected* rate of behavior, and his expectations are verbalizations of his conception of an appropriate rate of behavior for another. To the extent that an individual is exposed to models who smoke a great deal and believe that a high rate of smoking is appropriate for themselves and for others, we would expect the attitudes and behavior of the recipient of this influence to be comparably high (all other influences held constant).

In addition to those influences that might be scaled as a rate or projected rate of be-

havior, significant others are held to be influential in that they influence other related attitudes. Thus, the related attitudes of models themselves may be viewed as influential in forming the focal individual's own related attitudes.

Relevant Phenomenal Reality. In addition to those sources of influence that stem from the words, deeds, or attitudes of significant others, Woelfel and Haller suggest that individuals make unassisted observations of aspects of their experiential world that influence their attitudes and, in turn, their behavior. For example, in the case of educational aspirations, the individual's academic performance is considered to be influential with respect to the student's future educational aspirations. In the case of smoking behavior, the features of the individual's smoking experience relevant to his smoking attitudes and future behavior may be the individual's interpretation of his physiological response to smoking (e.g., respiratory difficulty).

Structural Factors. Other factors that may influence the smoking behavior of individuals include, of course, the obvious relationship between age and smoking, in that smoking is regarded as taboo for the very young. Access to smoking or non-smoking situations, such as frequency of alcoholic drinking, smoking marijuana, or working in a place that forbids smoking, will also influence the rate of behavior in that they involve situational constraints on the behaviors as well as indicating a climate of belief in which smoking is held either appropriate or inappropriate.

Mass Media. Not examined by Woelfel and Haller in their investigation of the aspiration and attainment process are the effects of mass media in the attitude formation process. While the mass media may have little bearing on the formation of aspiration attitudes, it is suggested that they have greater relevance to cigarette smoking. Few members of American society have escaped advertising either for or against smoking. Because television, radio, newspapers, etc. provide individuals with information regarding the pleasures, hazards, or cost of smoking, it is suggested that they will play a role in the formation of individuals smoking attitudes in much the

same fashion as significant others. We would expect that the impact of mass media on the rates at which individuals smoke to vary in proportion to: (1) the amount of smoking-related information presented in the media; (2) the degree to which the individual is exposed to that media; and (3) the stance of the information presented toward smoking. Thus, when individuals have considerable exposure to media replete with references urging cigarette consumption we would expect higher rates of smoking. If any of these variables were to change, we would expect its effects on the smoking attitude to change as well.

Methodology

To determine the appropriateness of applying a theoretical perspective developed in the study of the educational and occupational attainment process to the study of the formation of smoking attitudes and behavior, 156 college undergraduates and their significant others were surveyed with respect to their smoking beliefs and behaviors.

The variables identified in the above theoretical discussion were measured by means of questionnaires administered to undergraduate students. A major portion of this questionnaire was a modified version of the Wisconsin Significant Other Battery (WISOB). This collection of instruments elicited the names, addresses, and roles of specific individuals in the attitude formation process. It identifies the roles of significant others in terms of whether they have spoken to the focal individual about some aspect of smoking (definers), or are known to the respondent as an example of some smoking related attitudes or behavior (models). The Wisconsin Significant Other Battery is a substantial battery of forms and the reader is referred to Haller and Woelfel (1969) for an extended discussion of the reliability and validity of instruments used as models in this investigation.

In addition to the identification of sources of interpersonal influence, these questionnaires were employed to measure the theoretical variables in the following manner:

The Rate of Smoking. The respondent's rate of smoking was measured by means of

three items: (1) how many cigarettes the respondent smoked the day before the questionnaire administration; (2) how many cigarettes the individual estimated he would smoke by the end of the day; and (3) the respondent's estimate of his average daily cigarette consumption. The dependent variable used in this investigation is the average response of all three of these questions.

The Smoking Attitude. The smoking attitude in terms of a projected rate of behavior is measured as the average response to two questions, one that asks the respondent how many cigarettes he would want to smoke if he could smoke at any rate he wished (ideal rate of smoking); the other asking how many the individual actually believes is appropriate for him to smoke (realistic rate of smoking).

Other Related Attitudes. Each original respondent was asked to assess the importance of each of the following smoking related issues to himself: (1) the inconvenience of cigarette smoking; (2) the gratification to be derived from smoking; (3) the possible effects of smoking on health; and (4) the relationship between smoking and one's social life. Each of these items was measured in terms of a five point Likert-type scale, ranging from very important to not important at all.

Significant Others' Influence. To operationalize those variables related to interpersonal sources of influence, questionnaires were sent directly to the individuals named on WISOB. Models were asked to specify their own rate of smoking (model's behavior), their smoking attitude (model's attitude), and their own assessment of the importance of the other related attitudes listed above. Each of these variables was measured by means of questions identical to those asked of the original respondent.

Definers were asked to give their ideal and realistic estimates of a rate of smoking appropriate to the specific individual for whom they were a significant other. The average of the responses to these two questions is taken to indicate the definer's *expectations*, in the form of a projected rate of behavior. Definers were also asked to assess the importance of the related smoking issues for the individual.

Each of the significant other influence

variables is actually the average response of all of each original respondent's significant others. For a discussion of the actual procedures employed in this step and their theoretical implications, the reader is referred to Mettlin (1970).

To assess the impact of the variable termed *relevant phenomenal reality*, each respondent to the original questionnaire was asked to assess the frequency with which he experienced respiration difficulty ("a cough, wheeze, etc.") on a five-point Likert item ranging from all the time to never.

Three *mass media* variables were operationalized by means of three questions with reference to each of the following media: television, radio, and newspapers and magazines. The respondents were asked how often they watched, listened to, or read each of the media; how often they observed references to smoking in each of the media; and what they judged to be the stance of each media source toward cigarette smoking. The first two of these questions employed five-point Likert scales of frequency, while the third employed a Likert scale ranging from strongly in-favor to strongly opposed. For each of these three media, the variable was operationalized as the product of the three questions.

Structural factors are here operationalized in terms of the respondent's age and sex and the frequency with which he drinks alcoholic beverages, smokes marijuana, and engages in athletic sports. The drinking and marijuana variables are each measured by an open-ended question, asking the individual the average number of occasions in which he engages in the behavior each week, while the sports variable is the number of activities the respondent selected on a check list of ten different participation sports.

Findings

Of the original sample of 156 undergraduates, usable responses to the modified WISOB amounted to 120 cases. From this set of cases, a total of 760 agents of interpersonal influence were accurately identified. Questionnaires were mailed to this population and 441 completed responses were obtained—a response rate of fifty-eight per cent. As a result of the further

attrition stemming from the fact that no significant other influence information was obtained in some instances, 97 of the original cases remained (51 males and 46 females).

The average age of the undergraduate respondents was 19.7 years. Their average rate of smoking was 4.8 cigarettes per day, while their average smoking attitude was less (2.1 cigarettes per day). For each respondent, data were obtained from an average of 4.5 agents of interpersonal influence. These significant others tended to be older than the focal individual (26.2 years) and smoked at a greater rate (6.4 cigarettes per day) than the focal individuals.

To assess whether the Woelfel-Haller model is at all appropriate to the study of smoking behavior, a correlational analysis was conducted. Multiple correlations, using all of the above-mentioned independent variables to predict smoking rate, were performed. The results of these calculations are presented in Table 1.

Because the approach being employed demands examination of a large number and range of operational variables, it is difficult to observe the aggregate effects of the theoretical variables originally described (i.e., significant other influence, other related attitudes, etc.). To illustrate the effects of these variables as by classes of information sources, an additional multiple correlation and regression, using constructed variables, was calculated. These data may be found in Table 2. The new variables were calculated by: (1) multiplying each operational variable by its observed regression coefficient (cf. Table 1); (2) adding the products of the related variables together to form six independent variables; and (3) performing new correlations and regressions with the new variables (Woelfel and Haller, 1970). The multiple correlation coefficients remain unchanged, but the new observed *beta* weights obtained for the six new variables provide one means of examining the relative effects of the theoretical variables examined here.

Discussion

It would be difficult to provide a detailed interpretation of these findings. First, they

TABLE 1. OBSERVED MULTIPLE CORRELATION, REGRESSION, STANDARDIZED REGRESSION AND *F* COEFFICIENTS FOR PREDICTIONS OF THE SMOKING RATES OF 97 FOCAL INDIVIDUALS (FI).

Dependent variable: Focal Individual's Smoking Rate			
Independent variables:	<i>B</i>	<i>Beta</i>	<i>F</i>
FI Smoking Attitude	.36	.19	3.10*
Other attitudes:			
Inconvenience	-.52	-.08	.86
Gratification	.23	.04	.19
Health	-.68	-.08	.91
Social life	-.20	-.03	.14
Respiratory problems	2.84	.36	16.62*
TV	.00	.00	.00
Radio	-.04	-.06	.54
Newspaper	-.01	-.01	.06
Age	.78	.24	7.86*
Sex	.30	.02	.04
Marijuana	.06	.01	.02
Alcohol	-.28	-.04	.30
Sports	-.51	-.12	2.49*
Models' smoking rate	.19	.17	3.47*
Models' smoking attitude	.14	.06	.35
Definer's Expectations	-.20	-.04	.18
Models' related attitudes:			
Inconvenience	-.44	-.04	.22
Gratification	-.10	-.01	.01
Health	3.09	.21	4.65*
Social life	-.13	-.01	.01
Definers' related expectations:			
Inconvenience	.76	.08	.75
Gratification	1.76	.22	2.12
Health	-1.94	-.17	3.49*
Social life	1.15	.12	.82
<i>R</i>	.81*		
<i>R</i> ²	.66		
<i>df</i>	71		

* Significant at .05, one tail test.

have not been presented in the form of an adequate causal model, although such a model was implied in our discussion of the theory. The sheer number of variables and the number of paths involved makes such an approach impractical. Additionally, since these data were drawn from examination of a limited population, several of the specific hypotheses obscured by this analysis of the data would not find adequate test here.

There is, however, a level of interpretation that these data will bear that has relevance in assessing the general utility of the approach. First, examination of the multiple correlation coefficients strongly sug-

TABLE 2. OBSERVED STANDARDIZED REGRESSION COEFFICIENTS FOR PREDICTION OF THE FOCAL INDIVIDUAL'S SMOKING RATE, USING THEORETICAL INDEX VARIABLES

Dependent variable: FI smoking rate		
Independent variables:	<i>Beta</i>	<i>F</i>
FI smoking attitude	.19	8.00
FI related attitudes	.14	4.8
Significant other influence	.40	33.50
Media	.07	1.14
Structural factors	.24	13.35
Relevant phenomenal reality	.39	36.64
<i>R</i>	.81
<i>R</i> ²	.66
<i>df</i>	.90

gests that this model allows fairly accurate levels of prediction. The explanation of 66 per cent of the variance in the measured smoking behavior exceeds the comparable coefficients of determination originally obtained by Woelfel and Haller in predictions of the aspiration attitude (1970). Thus, there is reason to suspect that the model is at least as applicable to cigarette smoking behavior and the formation of smoking attitudes as it is to the study of educational and occupational aspirations and attainments.

In addition to the high levels of prediction obtained, examination of the *betas* in Table 2 indicates relative importance of influences on smoking consistent with that suggested by other sources. That interpersonal sources of influence would have greater effects than media sources is consistent with the findings of Newman (1970) and others who emphasize the importance of agents of interpersonal influence. While these coefficients are likely to change some as the model is exposed to more rigorous tests, they suggest at least that a wide range of diverse variables may be meaningfully examined simultaneously.

Without engaging in a detailed examination of all hypothetical relationships implied by the Woelfel-Haller model, the data presented here support the earlier contention that rates of smoking may be predicted and explained by reference to a theoretical perspective that views diverse forms of influence in terms of the role they play in pre-

senting or controlling the presentation of information to the individual.

The implications of these findings for the future study of smoking are several. First, the approach applied here has conceptualized smoking behavior as a non-medical phenomenon. It urges the reader to suspect that the physician's interest in the behavior is coincidental to its causes and that physicians should be no more capable in influencing smoking behavior than an individual with no medical training. It suggests further that the medical or quasi-medical approaches implicit in "smoking withdrawal" programs are ill-conceived. To treat smoking as though it were an habituation to a drug overlooks the crucial determining role of the social structural and social-psychological variables involved. It is little wonder, then, that such programs have dismal long term success rates. Any short term reductions in the smoking rates achieved in an intensive program are, in the long run, overshadowed by the enduring effects of variables, such as interpersonal influence and social structural influences.

Further, given the limited effect of the media variables in the determination of the smoking rate observed here, it seems unlikely that the current proselytizing by "anti-smoking" forces via the mass media will have any dramatic effects. In fact, there is little data to suggest that smoking trends are in any significant state of flux as a result of all of the information being distributed by media. In practical terms though, it is indeed the case that smoking behaviors are determined by the presentation of information, then the utilization of mass media is one of the few tools available to agencies desiring to reduce cigarette consumption in the United States. However, given that mass media are only one source of information among several others, its impact is more likely to be felt as a trickle than as a flood.

Finally, in spite of all the limitations that must be applied to the interpretation of these findings, they do provide a reasonable empirical foundation indicating the importance of further research along these lines. These findings suggest that conceptualizing smoking behaviors, in terms of a rate of behavior, is a valid and useful approach. Furthermore, they support the im-

portant Woelfel-Haller contention that a number of diverse sociological and psychological variables may be simultaneously examined in terms of the information that they represent or control and that this underlying dimension may be viewed as a "motor force toward behavior." Further research on this issue with regard to smoking and other behaviors as well seems warranted.

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INTERNATIONAL HEALTH FOUNDATION AWARD—1973

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