Mothers' dental health practices are among the most influential factors determining the dental practices of their children. For this reason the factors which shape the dental behavior of mothers are identified and investigated. As a result, the author suggests that behavior should be changed first in order to change attitudes. The role of mothers is confirmed. Further study is needed.

SOCIOECONOMIC STATUS AND FACTORS INFLUENCING THE DENTAL HEALTH PRACTICES OF MOTHERS

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Introduction

A NUMBER of previous studies have demonstrated that parents' dental health practices are associated with children's practices, but few studies have provided data on the influence of factors which are associated with pertinent parental behavior. Metz and Richards[1] examined "the separate effects of income and parents' education on children's practices, then . . . the effects of the two jointly, and finally, the effects of three factors—income, education and parents' practices—jointly."

Surveys, of course, have repeatedly looked at adult behavior and have made clear the existence of certain associations, e.g., social class and preventive dental practices. Kriesberg and Trieman[2,3] among others[4] found that the higher the socioeconomic status, the greater the frequency of dental visits. They found that education and income separately and together are very highly correlated with preventive dental care, that early childhood training also appears to facilitate later adult practices, that adults who value maintaining their natural teeth see the dentist for preventive reasons. They also found that treatment practices of the dentists were highly associated with adults' preventive visits to the dentist. Lambert and Freeman[5] found a "statistically significant correlation between the income of a family and the extent to which mothers engaged in preventive dental behavior," but "no direct statistically significant relationship between adult preventive behavior and education." Suchman and Rothman,[6] in their study of the utilization of dental services, found that not only socioeconomic status but the "component measures of socioeconomic status—income, occupation and education—act independently of one another, though each influences dental care practices." Repeatedly these variables are demonstrated as being associated with dental care. What is needed now, however, is not more replication, but a causal ordering, a causal model of adult behavior which provides guidance for changing children's behavior. We need to know *where* to intervene in the causal chain in order to know *how* to intervene.

Purpose

An earlier causal anaylsis of survey data on socioeconomic status and role of the family in the adoption and maintenance of children's dental health practices suggested that mothers' dental health practices are one of the most influential factors in determining the nature of children's practices.[7] Moreover, this influence tends to permeate low, middle, and upper socioeconomic groups. The purpose of this paper is to identify and investigate those factors which shape mothers' dental health behaviors. An ancillary purpose is that of providing information which may be useful to the health educator. That is, to identify those influential variables which are most amenable to change or dental education.

Hypotheses

Bem postulates that attitudes may follow a given behavior because the individual infers his attitude from his behavior.[8] Bem's "self-perception" explanation is essentially the same as Festinger's theory of cognitive dissonance and seems to be compatible with the observations of others concerned with attitudes and behavior.[9] Kreisberg, et al.,[3] in respect to dental health practices, have suggested that beliefs and attitudes "among adults follow rather than motivate the practice of going to the dentist preventively." For example, you brush your teeth early in life because mother insists. It is then that you develop attitudes about toothbrushing. You do not build favorable attitudes and then decide to brush your teeth. Your attitudes result from what you do rather than lead up to your actions.

Since much effort is expended in attempts to change attitudes toward dental health practices, it seemed reasonable to investigate the causal relationship of mothers' attitudes and practices. Accordingly, our first hypothesis is that: mothers' attitudes toward dental health practices are products of their dental practices, rather than precursors.

Another question posed by the association of socioeconomic status and dental health practices has to do with class values. If an individual sees himself as belonging to a particular social class, then one might expect a causal relationship between his perceptions and his practices, based on his belief that specific values are normative for his social class. Therefore, our second hypothesis states that: the dental health practices of mothers are causally dependent on mothers' perceptions of their own social class, i.e., subjective social class. In other words, if a mother sees herself as middle-class, she follows the normative dental practices of what she believes to be middle-class values.

Sample

A random sample of 524 white children, ranging in age from 11 to 14 years, were selected from two school districts in a suburban community of 52,400 persons in Buffalo, New York. Mothers of the children were interviewed by use of a pretested, coded questionnaire. Their responses have furnished the data for analysis.

Method

Selected items on demographic, attitudinal, perceptual and dental health behavior responses—an example of the latter would be the frequency with which the respondent brushes his teeth —were scaled using a modified Guttman technique. The resulting monotonic scales were correlated and an intercorrelational matrix developed. Kendall's Tau for large numbers of ties was the statistic of choice. Linkage analysis reduced the matrix to the most essential variables. A linear causal model for the

total sample was computed by the method of path coefficients in the manner suggested by Wright, Duncan, Blalock and others.[10] A subsequent sorting of the total sample, based on fathers' occupations, showed 472 families wherein data were complete enough for analysis. Of these, 33 were identified as members of the lower socioeconomic status group, 251 as middle and 188 as upper. Each group was then subjected to a separate path analysis and a causal model developed for each.

Now if I may digress for a moment, I should like to tell you a bit about the concept of causal models as I have used it, and about path analysis which provides the mathematical rationale for ordering the variables of a causal model. As you know, models imply that one thing causes another, and that this can be shown to be so mathematically. They may not in real life, but this is as close as we can get before manipulating one variable to see if it changes another. To this extent, stating that one variable causes another in the models is a way of talking about the models. In other words, causality is hypothetical, just as the model is. On the other hand, though, models *are* constructed through the use of empirically derived variables selected by the researcher who sees in them a system of relationships. This system must make sense from the point of view of an accepted or postulated theory, or group of hypotheses, all of which certainly imply causal relationships. Given such a system, or model, there must be a method for establishing the logic and consistency of the set of hypotheses implied by the model. The method of path coefficients is the mathematical procedure, the proofs of which specify the ordering of the variables in the model, thereby allowing one to empirically state that one variable causes another in the sense described above.

Findings

Examination of Figure 1, the model for the total sample, demonstrates influences which may have particular significance for understanding mothers' behaviors and, indirectly, for dental health education.

In accordance with the findings of others, education, family income, and fathers' occupation seem to be most influential in defining subjective social class.[11] The model substantiates a finding of Kreisberg[12] on the effects of having knowledge on dental care, i.e., that "adult knowledge about dental care does not affect their own preventive utilization of dentists' services." Authoritative information obtained by mothers after their children start school appears to be partially influential in determining mothers' attitudes toward their own toothbrushing behavior, though it seems not to influence their actual behavior. In support of our first hypothesis, the model indicates that mothers' attitudes toward dental health stem from the frequency with which toothbrushing and dental visits occur. Mothers' attitudes in general, seem to be causally dependent upon mothers' practices; e.g., their expressed satisfactions with their children's dental conditions appear to be influenced by their own frequency of dental visits. An exception to the above may be the causal link between parents' levels of education and the mothers' *general* concerns for their children. Apparently, the more highly educated the parents, the fewer and less intense are the mothers' other concerns for their children. In turn, the fewer and less intense concerns for their children also influence their expressed satisfaction with the children's dental conditions.

Level of formal education of the parents, in addition to contributing to subjective social class, seems to exert considerable influence on mothers' dental

health practices. Subjective social class appears to depend on parents' education, family income, and fathers' occupations; furthermore, it seems to influence mothers' practices and attitudes—all of which may be interpreted as supporting our second hypothesis, i.e., that the dental health practices of mothers are causally dependent on mothers' perception of their own social class.

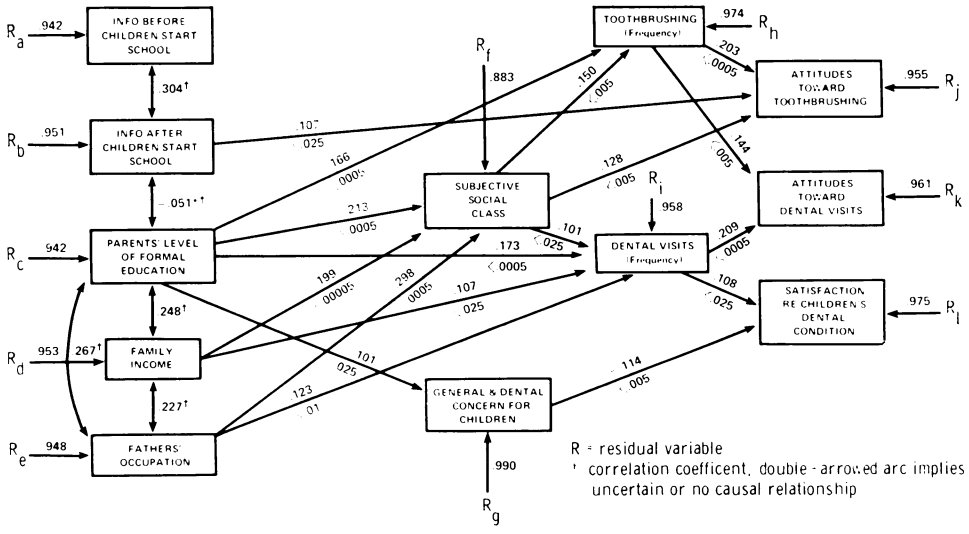
Model for Lower SES Group

Turning now to the class models, we find in Figure 2 that, among the lower socioeconomic status (SES) mothers, only one causal link is held in common with the total sample. Level of parents' formal education seems to influence mothers' frequency of toothbrushing. However, mothers' satisfactions with children's dental conditions are also influenced by parents' formal education. For this group, education and income seem not to define subjective social class. Attitudes are not significantly related to mothers' dental health behaviors. Mothers' knowledge appears to be mainly limited to authoritative information obtained before their children started school, i.e., their own early information—and causally related only to their frequency of toothbrushing. The picture presented may be that of a group outside the mainstream of society—possibly alienated—or a group deprived of good dental care, that does not hold dental health as a value.

Model for Middle SES Group

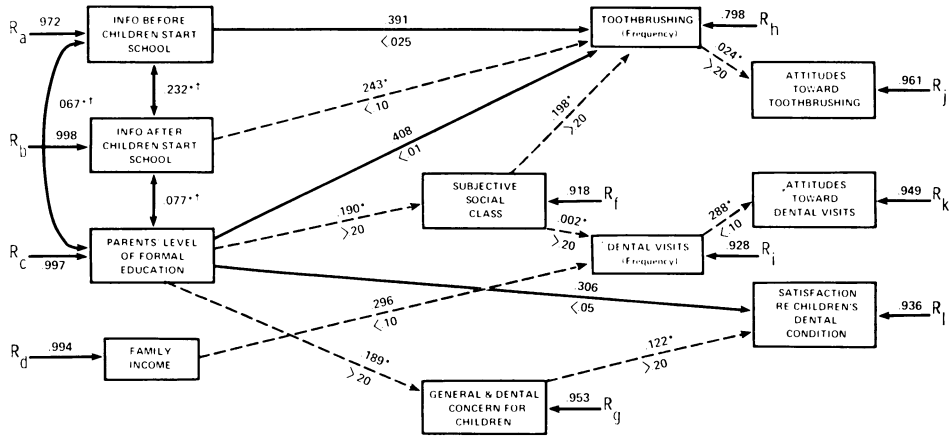
The model for mothers of the middle socioeconomic group in Figure 3 most clearly follows that of the total sample—with one or two exceptions. For this group, education, but not income, seems to determine subjective social class. Subjective social class is an intermediate in the causal chain, falling between education and practices, although education appears directly causally related to frequency of dental visits as well. Authoritative information obtained by the mothers after their children start

Figure 1—Dental health practices of mothers—causal model for total sample*; path coefficients and probabilities (N=472)



* The model is read in the direction of the paths (arrows) and variables to the right are causally dependent on those to the left.

Figure 2—Dental health practices of mothers—causal model for lower social class*; path coefficients and probabilities (N=33)



* See note under Figure 1.

school seems to influence both their attitudes toward toothbrushing and toward dental visits, but not their practices. Attitudes toward dental health practices and toward the children's dental conditions seem shaped by the mothers' frequency of toothbrushing and dental visits. Positive attitudes, then, may spring from both frequencies of certain behaviors and information, although the latter seems not to influence behavior.

The mothers of this middle socioeconomic group present a picture of a group very much in the mainstream of society, of one that is aware of external sources of information, of a group whose attitudes toward dental practices are influenced by this information, of one holding dental health as a value, and one which is striving to achieve dental health.

Model of the Upper SES Group

In Figure 4 we have the model for mothers of the upper socioeconomic group. The pattern for this group, like that for the lower socioeconomic group, deviates considerably from the pattern for the total sample and for the middle socioeconomic group. Two striking differences occur. Subjective social class appears to have no influence on mothers' practices. It mediates only in respect to mothers' satisfactions with their children's dental conditions. Subjective social class is primarily influenced by family income. Parents' education appears to have less effect. However, level of parents' education seems to be the variable most influential for frequency of mothers' toothbrushing and dental visits. Attitude toward toothbrushing seems not significantly influenced by mothers' frequency of brushing, though a trend is evident. Attitude toward dental visits, similar to the pattern for the total sample and the middle socioeconomic group, seems to stem from the practice of making dental visits.

There appears to be a generally inverse trend in the causal relationships of mothers' concerns. The trend seems to be for less concern where there is an increase in both parental education and

family income. And less concern about the children tends to be influential in increasing mothers' frequency of dental visits. The links in the causal sequence are somewhat weaker in this part of the model, but suggest, nevertheless, that where cost of care is not a problem, when mothers can be sure of providing care for their children, concern naturally plays a minimal role in maintaining dental health. Perhaps less concern about her children allows the mother to have more concern about her own dental health.

Lastly, information from authoritative sources, either before or after the children start school, seems to have no significant influence on mothers' own practices or attitudes.

This group, then, presents a picture of fixed values. Decisions about dental health practices or prevention appear to be minimal, and the concepts of prevention and good dental health practices, normative.

Apart from these findings, the models tend to support studies of other investigators of socioeconomic status and dental health.

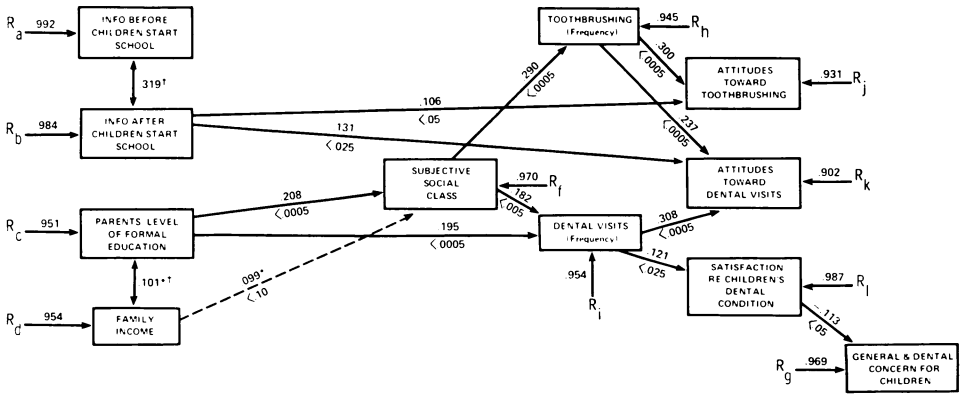
Discussion

Thus far, both hypotheses are supported by the model for the total sample. Attitudes appear to be causally related to practices and seem to be products of behavior rather than predecessors. If we assume the model to be a correct reflection of the situation, then the implication is that dental health practices influence dental health values, and the way to get at practices is to effect practices themselves and not indirectly, through attitudes.

The model further indicates that subjective social class is an important intervening variable. Establishing dental health values appears to be a family affair closely related to the mothers' subjective social class. Good dental health practices are normative where dental health values are accepted as part of the family life style.

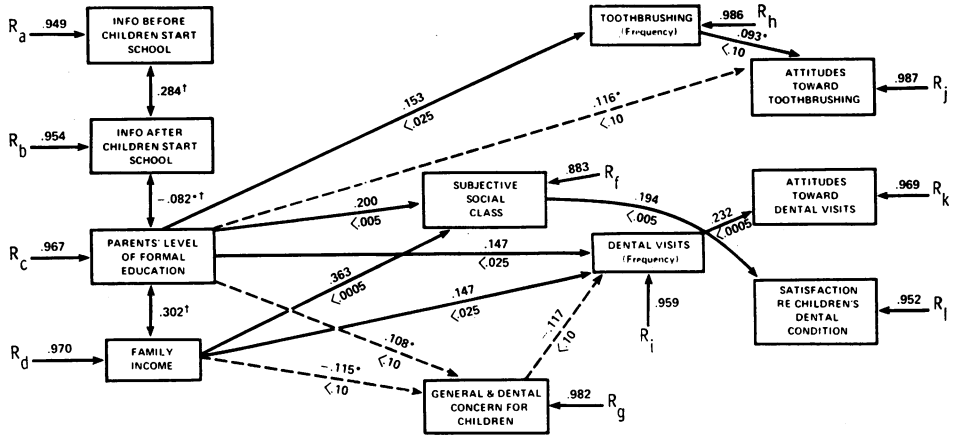
Among the class models, our first hypothesis is supported by the models of the middle and upper socioeconomic groups, but not the lower. *Where there are few practices, attitudes seem to be ambiguous or nonexistent.* It may be

Figure 3—Dental health practices of mothers—causal model for middle class*; path coefficients and probabilities (N=251)



* See note under Figure 1.

Figure 4—Dental health practices of mothers—causal model of upper class*; path coefficients and probabilities (N=188)



* See note under Figure 1.

that dental health attitudes are expressions of conformity with situationally established behaviors. People like what they are doing because they are doing it. Or, because their group holds that kind of behavior as a value, they then say they like doing it. In other words, the process operating between behavior and value constitutes a two-pronged concept of attitude, involving salience and relevance. Both aspects of attitude seem to be visible in the models, and suggest, as does Chaffee and Lindner's study of value change,[9] that change of attitude does not necessarily bring about change in behavior. If so, then attempts to bring about change in dental health practices through change in attitude might be futile. But we have indications that change in mothers' dental health practices really ought to take place if children are to acquire good practices.

Our second hypothesis is supported only by the middle socioeconomic group. The lower and upper socioeconomic groups seem to represent extremes—no dental health values for the lower and fixed values for the upper, with neither causally related to subjective social class. The middle group, falling between the extremes, seems to be most involved in acquiring dental values, and in making dental health decisions.

Since dental health values become more normative—i.e., persons regularly brush teeth and regularly make preventive dental visits—as one moves up the social hierarchy, it would seem appropriate to intervene in the causal chain via subjective social class. However, providing new subjective definitions of social status for individuals would be dependent upon factors beyond the control of the health educator. Moreover, comparisons of the three models show parents' education, which contributes to subjective social class, to be more important than subjective social class in determining mothers' dental practices. Education in each model is a direct causal variable for each class. The influence of parents' formal education on mothers' practices suggests that parents' education might prove to be a more

viable point of intervention in the causal chain than subjective social class. But parents' formal education is mainly in the past. Health education may be a different kind of education, or it may be part of their formal education. In any case, the same cognitive processes operate whatever the material being learned. To argue that it is impossible to change parents' behavior through augmenting parents' education is to deny education as a continuing process. Rather than deny the feasibility of education as a means of changing adult behavior, one might examine the "input" to mothers.

The lack of significant influence on mothers' practices of information from authoritative sources may only mean that different methods of informing are needed. And it is possible that information must be given a "new look," or a "new feeling." Information obtained by the mothers after the children start school is usually specific to children—or at least viewed this way by the mothers—a characteristic also typical of the public media. Perhaps the emphasis should be shifted to more fully involve the mothers. Verbal communications should be accompanied by some requirement for active behavioral responses on the part of the mothers. Perhaps health educators ought to ask mothers to participate in the children's dental health programs, during which emphasis might be placed on the importance of the mothers' dental health for their own well-being, on the need to value their own teeth, and on the role they play in providing either good or poor examples of dental practices for their children. During such an educational program, mothers could be shown how to make dental health decisions for themselves as well as for their children. The health educator might teach the mothers directly and the mothers, in turn, might teach their own children under the supervision of the educator. Since establishing dental health values seems to be a family affair, why not make dental health education a family affair also?

One last point. It may be that by allocating public health funds largely in the interest of the children's health, we unintentionally "write off" the mothers' power as well as their needs. If so, this may be a serious mistake. If children's dental health practices depend on observing their mothers' practices, then it seems reasonable to expend some effort in the health education of the mothers.

Conclusions

By way of summary: Regardless of social class, education of mothers to provide good examples seems to be the key to changing children's dental health practices. Methods of adult education could be designed to change behavior first rather than attitudes and, in this way, promote regular and good dental practices whether or not the desire to brush or visit the dentist is strong. And, finally, even though the models need further empirical testing, the methods used to derive them should be exploited as much as possible in the interest of dental health. Path coefficients give more meaning to correlations. The models may suggest useful theoretical leads and, from our point of view, indicate those measures most fruitful for the improvement of dental health practices.

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This paper was presented before the Dental Health Section of the American Public Health Association at the Ninety-Seventh Annual Meeting in Philadelphia, Pa., November 12, 1969.