

## Adolescent Health Behavior and Conventionality-Unconventionality: An Extension of Problem-Behavior Theory

John E. Donovan, Richard Jessor, and Frances M. Costa

*Institute of Behavioral Science  
University of Colorado at Boulder*

Examined the relation of psychosocial and behavioral conventionality-unconventionality to health-related behavior in cross-sectional data from 1,588 male and female 7th to 12th graders. Conventionality-unconventionality was represented by personality, perceived social environment, and behavior variables selected from the social-psychological framework of problem-behavior theory (R. Jessor & S. L. Jessor, 1977). Greater psychosocial conventionality correlates with more regular involvement in health-related behavior (regular physical activity, adequate sleep, safety belt use, attention to healthy diet). Greater behavioral conventionality (less involvement in problem behaviors such as marijuana use, problem drinking, delinquent-type behavior, and greater involvement in conventional behaviors such as church attendance) was also associated with greater involvement in health-maintaining behavior. The overall findings provide support for the extension of problem-behavior theory to the domain of adolescent health behavior and for the relevance of the dimension of conventionality-unconventionality.

Key words: adolescence, health behavior, problem behavior, conventionality

In this article, we explore the linkage between variation in adolescent conventionality-unconventionality, on the one hand, and variation in adolescent health-related behavior, on the other. Conventionality-unconventionality has been conceptualized here as a dimension underlying and summarizing an orientation toward, commitment to, and involvement in the prevailing values, standards of behavior, and established institutions of the larger American society. This generalized dimension of individual differences underlies several of the personality, social environment, and behavior variables comprising problem-behavior theory (R. Jessor, 1987; R. Jessor & S. L. Jessor, 1977).

Problem-behavior theory is a social-psychological framework that has been developed to account for variation in adolescent involvement in a variety of problem behaviors as well as conventional behaviors. Problem behaviors are behaviors that have been defined socially as a problem, as a source of concern, or as undesirable by the norms of conventional society, and their occurrence usually elicits some kind of social control response. Examples in adolescence include delinquent behavior, problem drinking, illicit drug use, and precocious sexual activity. Conventional behaviors, in contrast, include church attendance, involvement in school activities, and other behaviors that are socially approved, normatively expected, and institutionalized as appropriate for adolescents and youth. The framework of problem-behavior theory, with its assessment of variables relevant to psychosocial and behavioral conventionality-unconventionality, has been shown to account for between a third and a half of the variance on measures of these different problem behaviors and conventional or conforming behaviors in national as well as local samples of ad-

olescents (Donovan & R. Jessor, 1978; R. Jessor, Chase, & Donovan, 1980; R. Jessor & S. L. Jessor, 1977).

The category of adolescent health-related behaviors, which constitutes the focus of the present study, includes those actions or practices that either compromise or maintain an individual's physical, mental, or social health; subjective sense of well-being; or effectiveness of functioning (see Perry & R. Jessor, 1985). The focus in this article is on behaviors relevant to physical health. Examples include sedentary behavior patterns, overeating, unprotected sexual intercourse, cigarette smoking, alcohol and drug abuse, regular exercise, healthy eating habits, adequate sleep, regular dental care, and good safety practices (see Califano, 1979).

As should be obvious, there is some overlap between behaviors comprising the category of problem behavior and those considered health-compromising behaviors. Specifically, problem drinking, marijuana use, cigarette smoking, and unprotected sexual activity all can have a negative impact on health and also are subject to social norms and sanctions (ranging from disapproval to legal sanctions).

The major question posed in the present article is whether the explanatory variables of problem-behavior theory that reflect conventionality-unconventionality can account for variation in health-related behaviors that are not also problem behaviors. To the extent that they do, this would suggest the utility of viewing health-maintaining behaviors as a subcategory of conventional behavior. The expectation, then, would be that greater psychosocial and behavioral conventionality (or less unconventionality), as measured in the theory, would be associated with greater involvement in health-maintaining behavior (less involvement in health-compromising behavior).

In addition, there are other reasons to expect that conventionality and health-maintaining behavior are linked. Like conventional behaviors, health-maintaining behaviors are socially approved by conventional adult society. Adolescents are encouraged by parents, the media, schools, and other institu-

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Requests for reprints should be sent to John E. Donovan, Institute of Behavioral Science, Campus Box 483, University of Colorado, Boulder, CO 80309-0483.

tions to get adequate exercise, to get plenty of sleep at night, to eat healthy foods, and to use safety belts. Social norms are thus relevant to health-related behaviors just as they are to other conventional behaviors. In addition, much of the socialization concerning health behavior is carried out by institutions in our society—the family, the schools, and the churches—that have a stake in fostering conventional behavior. To the extent that adolescents are psychologically committed to these conventional institutions and positively involved with them, they should be more likely to adopt the patterns of behavior promoted by them, including health-maintaining behaviors, and less likely to adopt behaviors not endorsed by them, including health-compromising behaviors.

These considerations make a plausible case for extending problem-behavior theory to the domain of adolescent health behavior. Because variables in the framework that can be interpreted as reflecting conventionality–unconventionality relate successfully to variation in involvement in problem behavior, and because the conventionality–unconventionality dimension appears to be relevant to health behavior, reliance on the theory and its measures could help to illuminate the latter domain (see R. Jessor, 1984).

The social-psychological framework of problem-behavior theory encompasses three systems of explanatory variables: the personality system, the perceived environment system, and the behavior system. Each system is composed of variables that serve either as instigations for involvement in problem behavior or as controls against involvement in problem behavior. It is the balance between instigations and controls that determines the degree of proneness for problem behavior within each of the three systems. The overall level of proneness for problem behavior, across all three systems, reflects the degree of psychosocial conventionality–unconventionality characterizing each adolescent.

In the framework of the theory, problem-behavior proneness—or unconventionality—consists of the following profile of individual difference attributes. In the personality system, unconventionality is reflected by lower value on academic achievement, greater value on independence, greater value on independence relative to achievement, lower attitudinal intolerance of deviance, and lower religiosity. In the perceived environment system, unconventionality refers to less compatibility between parents' and friends' expectations, greater friends' than parents' influence on decision making, lower parental disapproval of problem behavior, and greater friends models for involvement in problem behavior. In the behavior system, unconventionality refers to greater involvement in the various problem behaviors (e.g., drug use and delinquent behavior) and lower involvement in conventional behaviors (e.g., school-related activities, academic performance, and church attendance).

Almost no previous research has examined systematically the linkage in adolescence between psychosocial conventionality–unconventionality and health behavior. Maron et al. (1986) did employ several attitudinal, social, and behavior measures modeled on problem-behavior theory variables to account for variation in safety belt use among adolescents. Although successful, that linkage relied strongly on variables highly proximal to safety belt use (e.g., attitudes toward safety belt use and friends' safety belt use) rather than ones that

might capture psychosocial conventionality–unconventionality more generally.

The most relevant research on adults has linked more frequent church attendance to lowered risk of contracting tuberculosis, to lowered risk of death from arteriosclerotic heart disease, emphysema, cirrhosis, and suicide (Comstock & Partridge, 1972), and to significantly lower blood pressure (Graham et al., 1978). Church attendance, although a conventional behavior, is a limited and rather remote proxy measure of the more elaborated dimension of concern here—namely, conventionality–unconventionality in problem-behavior theory. Further, these physiological disease states reflect health behaviors only in a very indirect way.

Chassin, Presson, and Sherman (1987) pointed out that “the covariation of positive health behaviors (i.e., diet, exercise, seat belt use) is unknown. [And] there is no empirical literature that has addressed the issue of whether a larger health life-style does or does not exist for adolescents” (p. 365). By addressing the relation of behavioral conventionality–unconventionality (i.e., problem drinking, illicit drug use, smoking, etc.) to the various measures of health-maintaining behavior, the present research should be able to contribute to this area of research.

Explanatory variables that are theoretically proximal to health-related behavior—that is, variables that have direct and obvious relationships and that actually refer to health and health-related behavior (e.g., value on health and health locus of control)—are likely to account for more of the variation in adolescent health-related behavior than does conventionality–unconventionality. In order to demonstrate more fully the utility of conventionality–unconventionality for the explanation of adolescent health-related behavior, additional analyses are carried out to determine whether conventionality–unconventionality accounts for significant variation in adolescent health-related behavior over and above that explained by these theoretically more proximal—and more usual—explanatory variables. In addition to measures of value on health and health locus of control, other personality system measures relevant to health are examined. These include a measure of one's concept of self as a healthy and fit person and a measure of the extent to which exercise, an important health-maintaining activity, occupies a central role in the adolescent's behavioral repertoire, serving as a way to achieve a wide variety of personal goals, including relaxation, mood alteration, celebration, excitement, and so forth. Social environment variables relevant to health that are examined involve the adolescents' exposure to social agents (mother, father, friends) who model an active concern with a variety of different aspects of their own health including their weight, exercise, sleep, safety, and diet.

## METHOD

### Study Design and Procedures

A stratified sampling frame was used to select a sample of 7th through 12th graders on the basis of school and grade attended, from the 11 secondary schools in a single school

district in northeastern Colorado. The district serves several urban and rural communities with a total population of about 72,000 residents and 7,000 secondary school students.

Active parental consent was requested for students' participation in the research. Of the 3,010 parents contacted by mail, 1,667 (55%) returned signed consent forms. This level of response, although lower than desirable, is similar to that obtained in several other studies in which active consent was sought from parents (see R. Jessor & S. L. Jessor, 1977; Lueptow, Mueller, Hammes, & Master, 1977; Severson & Ary, 1983).

Data were collected between mid-November and mid-December 1985. Anonymous questionnaires were filled out in large-group settings (e.g., in the cafeteria). The questionnaires were distributed and collected by members of the research team. Each student was given a token payment of \$5.

A total of 1,588 students completed questionnaires, constituting 95% of those who had received parental permission to participate, and 53% of those originally sampled. No information is available to permit comparison of participants and nonparticipants in the present research. It is assumed, however, consistent with studies that have made such a comparison, that participating students are more conventional in general than nonparticipants (see, e.g., Severson & Ary, 1983).

Of the 1,588 participants, 54% were female, 83% were Anglo (White), 8% were Hispanic, 5% were Native-American, 2% were Asian-American, and 0.4% were Black. With respect to school level, 57% were in Grades 7 through 9, and 43% were in Grades 10 through 12. The majority of the students came from middle-class backgrounds, and most (70%) lived in intact families. In comparison with the larger, secondary school population in the district, this sample overrepresents females (54% vs. 49%), minority students (17% vs. 12%), and junior high school students (57% vs. 50%).

## Questionnaire

The 1985 Health Questionnaire was 29 pages long and was printed so that it could be computer scanned and scored. Average time to complete the questionnaire was about 45 min for the junior high school sample and about 42 min for the senior high school sample.

Despite the length of the questionnaire, there was little evidence of respondent fatigue. Questions were formatted using lots of space, and most pages contained 10 questions or fewer. Even though students could skip any question they did not care to answer, there was relatively little missing data. Across the array of 16 personality, social environment, and behavior measures of conventionality-unconventionality described later, scores were available for no fewer than 93% of the junior high school males, 96% of the junior high school females, 94% of the senior high school males, and 97% of the senior high school females on any given measure.

Many of the measures comprising the questionnaire have been used frequently in earlier research. The measures of problem behavior and of psychosocial conventionality-unconventionality were developed originally to test the explanatory usefulness of problem-behavior theory (R. Jessor & S.

L. Jessor, 1977). These measures were abridged and modified for use in the present research. Measures of the health behaviors and of the theoretically proximal health orientation variables were developed specifically for the present research. All the measures are described briefly as follows.

## Measurement of Health-Related Behaviors

In addition to those health-related behaviors that are also problem behaviors (described later), a variety of other health-related behaviors was also assessed. Regular Physical Activity is a 3-item scale assessing the amount of time that adolescents spend exercising on their own or participating in organized sport or exercise programs outside of school physical education classes (Cronbach's  $\alpha = .72$ ). Usual Hours of Sleep is a single question asking how many hours of sleep adolescents usually get each night during the school week. Safety Belt Use is a single item assessing how regularly students use safety belts when in a car (from *hardly ever* to *almost every time*). Attention to Healthy Diet is an 8-item summative scale measuring the amount of attention adolescents pay to their usual diet—for example, seeing that their diet is balanced, limiting the amount of fat in the food they eat, and so forth ( $\alpha = .82$ ). Healthful Food Preferences is a scale for which adolescents choose between two alternative foods in each of 16 pairs ( $\alpha = .61$ ); higher scores indicate the extent to which more healthful foods (those with a lower sodium content, or less saturated fat, or more complex carbohydrates) are chosen over less healthful foods.

In addition to these five separate measures, a summary index of involvement in health-related behavior was constructed by summing T scores ( $M = 50$ ,  $SD = 10$ ) on the component behaviors. Despite the low level of consistency of involvement found across the different health-related behaviors in the present study (Cronbach's  $\alpha = .38$ ), the composite score was retained as an index summarizing individual differences in overall levels of involvement in the domain. Higher scores on the index reflect greater involvement in health-maintaining behavior.

## Measurement of Psychosocial Conventionality-Unconventionality

The questionnaire also included measures of the major variables in problem-behavior theory that constitute proneness to problem behavior and that also reflect the dimension of conventionality-unconventionality.<sup>1</sup> Further discussion of these variables can be found in R. Jessor and S. L. Jessor (1977).

<sup>1</sup>Other analyses established that these psychosocial measures of problem-behavior proneness explain variation in adolescent problem behavior in these data. The measures display consistent correlations with a variety of different problem behaviors (e.g., marijuana use, problem drinking, delinquent-type behavior) as well as with a summary measure of involvement across the different areas. Multiple correlations of .71 and .76 were obtained in the present data set for the junior high school sample and senior high school sample, respectively, when these measures are used to account for variation on the summary problem behavior index.

The following four measures represent the motivational-instigation structure of the personality system: Value on Achievement, a 5-item summative scale measuring the personal importance placed on the attainment of success in schoolwork ( $\alpha = .82$ ); Value on Independence, a 5-item scale assessing the personal importance placed on self-determination and autonomy from parents ( $\alpha = .70$ ); Independence-Achievement Value Discrepancy, an index reflecting the extent to which independence is valued more highly than academic achievement (score range = 0 to 30, after constant added); and Expectations for Academic Achievement, a 5-item scale assessing the subjectively held probabilities of achieving success in academic work ( $\alpha = .87$ ).

The personal control structure of the personality system was represented by two measures: Attitudinal Intolerance of Deviance, a 10-item scale assessing adolescent beliefs regarding the "wrongness" of a variety of normative transgressions including property destruction, lying to parents, shoplifting, and aggression ( $\alpha = .87$ ); and Religiosity, a 5-item scale measuring the personal importance placed upon religious teachings, practices, and counsel for the direction of daily life ( $\alpha = .89$ ).

There were two measures of aspects of the perceived environment system that are theoretically distal from problem behavior: Parent-Friends Compatibility, a 3-item scale assessing the degree to which an adolescent's parents and friends are perceived to have similar interests and common expectations ( $\alpha = .74$ ); and Parent Versus Friends' Influence, a 2-item scale measuring whether the views and opinions of parents or of friends are perceived as being more influential when a difficult decision is faced, for example, whether to continue in school or not ( $\alpha = .55$ ).

Two measures of perceived environment variables that are theoretically more proximal to problem behavior were included: Friends Models for Problem Behavior, a scale assessing the perceived prevalence of drinking, cigarette smoking, and marijuana use (and sexual intercourse among senior high students) among friends (junior high  $\alpha = .81$ , senior high  $\alpha = .75$ ); and Parental Disapproval-Approval of Drinking, a single question that asked how adolescents thought their parents felt about people their age drinking (high score = more approval).

#### Measurement of Behavioral Conventuality-Unconventuality

The behavioral dimension of conventionality-unconventuality was assessed by measures of the problem behavior and conventional behavior structures of the behavior system in problem-behavior theory.

Four measures were used to represent the problem-behavior structure: Delinquent-Type Behavior, a 10-item measure assessing frequency of engagement in the past 6 months in norm-violative activities, such as shoplifting, property destruction, getting into fights, lying to parents or teachers, and so forth ( $\alpha = .83$ ); Problem Drinking, a 3-item scale reflecting frequency of high-volume drinking (five or more drinks per occasion), drunkenness, and negative consequences due to drinking, all in the past 6 months ( $\alpha = .83$ ); Involvement With Marijuana, a 4-item scale of degree of involvement with the

drug in terms of ever use, experience of the effects of the drug, frequent current use, and ease of access to a supply ( $\alpha = .81$ ); and Cigarette Smoking, a 2-item scale summarizing past experience as well as levels of recent use ( $\alpha = .76$ ). A summary measure of current involvement in these and other forms of problem behavior (including drinking status, other illicit drug use, and sexual intercourse), the Multiple Problem Behavior Index ( $\alpha = .76$ ), was used in several analyses.

A measure of conventional behavior was also included: Church Attendance Frequency, a single question asking how many times in the past year religious services were attended, from none to more than once a week.

#### Measurement of Psychosocial Orientation to Health

The questionnaire also included a number of psychosocial measures that are theoretically proximal to health-related behavior and that were developed for the present study. In the personality system, these include the following: Value on Health, a 5-item scale assessing the personal importance placed on being healthy and feeling fit ( $\alpha = .77$ ), whose development and validation are described by Costa, Jessor, and Donovan (1989); Health Self-Description, a 5-item scale developed in tandem with the preceding scale, measuring the degree to which adolescents see themselves as being healthy and in good physical condition ( $\alpha = .80$ ); External Health Locus of Control, a 4-item scale developed using items similar to those used by Wallston, Wallston, Kaplan, and Maides (1976), assessing beliefs that factors outside one's control (luck, genetic background, parents, doctors) are responsible for the state of one's health ( $\alpha = .70$ ); Internal Health Locus of Control, a 2-item scale developed similarly to the preceding one, but measuring beliefs that good health is contingent on personal behavior ( $\alpha = .40$ );<sup>2</sup> and, Exercise Functions, a 9-item index of the extent to which physical exercise is used to achieve a diverse array of valued ends such as relaxation, mood modification, social integration, and others (score range = 0 to 9).

Three perceived environment system measures proximal to health-related behavior were also developed: Maternal Modeling of Health Behavior, an 8-item scale assessing adolescent perceptions of mother's attention to her own diet, exercise, sleep, and safety ( $\alpha = .77$ ); Paternal Modeling of Health Behavior, an 8-item scale analogous to the previous measure, but focusing on perceptions of father's attention to his own health ( $\alpha = .79$ ); and Friends Modeling of Health Behavior, an 8-item scale concerned with perceptions of the amount of attention best friends pay to their own diet, exercise, sleep, and safety ( $\alpha = .78$ ).

#### Analytic Procedures

In order to determine the generality of results across gender and age levels within this sample of adolescents, all analyses were carried out in each of four subsamples: junior high school males ( $n = 437$ ), junior high school females ( $n = 464$ ),

<sup>2</sup>Although this brief scale has low reliability, it was retained for its theoretical interest.

senior high school males ( $n = 296$ ), and senior high school females ( $n = 388$ ). Three participants did not report their gender and were not included in the analyses.

Pearson correlations were examined to determine the bivariate relations between the measures of conventionality-unconventionality and the measures of adolescent health-related behavior. Multiple regression analyses were examined to determine the multivariate relations of sets of conventionality-unconventionality measures with the adolescent health-related behavior measures. Hierarchical regression analyses (Cohen & Cohen, 1983) were examined to determine if the measures of conventionality-unconventionality account for additional independent variation on the adolescent health-related behaviors beyond that accounted for by the health orientation measures. Due to the relatively low level of missing data, the Pearson correlations were calculated using pairwise deletion, and the regression analyses were based on these correlation matrices.

All analyses that focused on the composite measure of adolescent health-related behavior were replicated predicting variation in the five component health-related behaviors as well. This was done in order to determine the generality of results across the separate indicators of health-related behavior.

## RESULTS

The results are organized in two sections. The first section examines the relation of the psychosocial and behavioral

measures of conventionality to the measures of health-related behavior. The second section examines the extent to which the measures of conventionality-unconventionality account for variation not explained by the more proximal measures of orientation to health.

### Relation of Conventionality-Unconventionality to Health-Related Behavior

Table 1 presents Pearson correlations between the measures of psychosocial and behavioral conventionality-unconventionality and the composite measure of involvement in health-related behavior. Nearly every measure of conventionality-unconventionality correlates significantly and in the expected direction with the summary measure of health-related behavior. The correlations are modest in size but are consistent across the four subsamples tabled. Only value on independence fails to correlate with health-related behavior. On the basis of these bivariate findings alone, conventionality-unconventionality would seem clearly relevant to variation in involvement in health-related behavior.

Of particular interest are the consistent negative correlations between the measures of problem behavior and the summary index of involvement in health-maintaining behavior. Greater involvement in delinquent-type behavior, problem drinking, marijuana use, and cigarette smoking are all associated with lower levels of involvement in health-

TABLE 1  
Pearson Correlations Between Measures of Conventionality-Unconventionality and the Index of Involvement in Health Behavior, by School Level and Gender

<i>Measures of Conventionality—Unconventionality</i>	<i>Index of Involvement in Health Behavior</i>			
	<i>Junior High School</i>		<i>Senior High School</i>	
	<i>Males<sup>a</sup></i>	<i>Females<sup>b</sup></i>	<i>Males<sup>c</sup></i>	<i>Females<sup>d</sup></i>
Personality system measures				
Value on academic achievement	.24***	.36***	.21***	.21***
Value on independence	.01	.05	.04	.00
Independence-achievement value discrepancy	-.21***	-.29***	-.16**	-.19***
Expectation for academic achievement	.29***	.38***	.27***	.20***
Intolerance of deviance	.28***	.38***	.21***	.26***
Religiosity	.24***	.33***	.20***	.21***
Perceived environment system measures				
Parent-friends compatibility	.24***	.34***	.21***	.15**
Parent versus friends influence	-.14**	-.24***	-.17**	-.10*
Friends models for problem behavior	-.17***	-.37***	-.13*	-.27***
Parent approval of teenage drinking	-.13**	-.09*	-.09	-.11*
Behavior system measures				
Multiple problem behavior index	-.23***	-.41***	-.17**	-.26***
Delinquent-type behavior/past 6 months	-.16***	-.35***	-.19***	-.19***
Problem drinking/past 6 months	-.13**	-.35***	-.15*	-.21***
Involvement with marijuana	-.19***	-.34***	-.15**	-.26***
Involvement with smoking	-.26***	-.43***	-.26***	-.34***
Church attendance/past year	.15*	.19***	.11	.15**
Demographic measures				
Age (months)	-.18***	-.12*	-.05	-.01
Father's education	.18***	.22***	.17**	.17***
Mother's education	.10	.13**	.09	.12*

<sup>a</sup> $n = 437$ . <sup>b</sup> $n = 464$ . <sup>c</sup> $n = 296$ . <sup>d</sup> $n = 388$ .

\* $p \leq .05$ , two-tailed. \*\* $p \leq .01$ , two-tailed. \*\*\* $p \leq .001$ , two-tailed.

maintaining behaviors. More frequent attendance at religious services, on the other hand, is associated with greater involvement in health-maintaining behaviors.

Also presented in Table 1 are the correlations of the sociodemographic measures of age (in months), father's education, and mother's education. Only father's education correlates consistently with health-related behavior. When these sociodemographic variables are partialled out of the other correlations presented in the table, there is little change in either the significance or the magnitude of the relationships.

Pearson correlations were also calculated between these measures of conventionality-unconventionality and the five separate health-related behavior measures of physical activity, sleep, safety belt use, attention to healthful diet, and healthful food preferences. These correlations (not tabled) support the correlations for the composite measure in Table 1.

Consonant with the general multivariate, system-level emphasis of problem-behavior theory, multiple correlations were calculated between each of five sets of variables representing personality, environmental, psychosocial (personality and environmental), behavioral, and overall conventionality-unconventionality, and the six measures of health-related behavior (the composite summary measure and the five component health-related behavior measures).<sup>3</sup> These multiple correlations are presented in Table 2.

Although modest, there is a highly consistent and statistically significant level of relationship between the sets of conventionality-unconventionality measures and the different measures of health-related behavior. Whether assessed by the personality measures, the social environment measures, their combination, the behavior measures, or all the measures together, conventionality-unconventionality explains significant levels of variation in all of the health-related behaviors and for both genders and at both school levels. The only consistent exception to this is the lack of significant relation between conventionality-unconventionality and healthful food preferences among the senior high school females.

Multiple correlations between psychosocial conventionality-unconventionality (Set 3 in Table 2) and the summary measure of health-related behavior involvement range from .37 to .53 across the four subsamples. The multiple correlations for behavioral conventionality-unconventionality (Set 4) are somewhat lower, ranging from .28 to .46 across the subsamples. Together, the psychosocial and behavioral measures of conventionality-unconventionality (Set 5) correlate .41 to .55 with the summary measure of health-related behavior. In general, these multiple correlations with the summary

<sup>3</sup>Personality conventionality-unconventionality was represented by four measures: the independence-achievement value discrepancy, expectations for academic achievement, attitudinal intolerance of deviance, and religiosity. Environmental conventionality-unconventionality was represented by parent-friends compatibility, parent versus friends' influence, perceived parental approval of teen drinking, and perceived friends models for problem behavior. Psychosocial conventionality-unconventionality was represented by all eight of these personality system and perceived environment system variables. Behavioral conventionality was represented by delinquent-type behavior, problem drinking, marijuana involvement, cigarette smoking, and church attendance. Lastly, overall conventionality-unconventionality was represented by all 13 of the aforementioned measures.

measure are larger than the multiple correlations with the component health-related behaviors.

There are only a few consistent gender or school-level differences in the magnitude of the relationships between conventionality-unconventionality and the different health-related behaviors. Gender differences may be seen with respect to the predictability of the summary index, sleep, and safety belt use in the junior high school sample (with *R*s for females higher) and with respect to healthful food preferences in the senior high school sample (male *R*s higher). School-level differences in predictability occur with respect to healthful food preferences for both genders (senior high school *R*s larger for males, smaller for females), and with respect to sleep and to the summary index of health-related behavior for females (junior high school *R*s higher).

#### Independent Contribution of Conventionality-Unconventionality to Explanation of Health-Related Behavior

Hierarchical multiple-regression analyses were performed to determine the extent to which psychosocial and behavioral conventionality-unconventionality accounts for variance in health-related behavior that is independent of that explained by other explanatory variables. Of particular interest here is whether conventionality-unconventionality, a set of variables that are theoretically distal from health behavior, can increase the predictability of these behaviors even after variables that are theoretically proximal (and that refer explicitly to health behaviors) have been entered into the regression equation.

Table 3 presents Pearson bivariate correlations between the eight health orientation measures described earlier and the summary index of involvement in health-related behavior. Nearly all of these theoretically proximal measures correlate significantly and in the expected direction with the summary index. Higher values on health, self-descriptions affirming health and fitness, greater internal locus of control, lower external locus of control, and beliefs that exercise serves a variety of positive personal functions are all associated with greater involvement in health-related behavior. Greater modeling of health-maintaining behaviors by parents and by friends also are associated with higher levels of involvement in health-related behavior. The magnitude of these correlations is, in general, higher than was seen for the separate measures of conventionality-unconventionality.

These health orientation measures were also correlated with the five separate component measures of health-related behavior, and the majority of these correlations (not tabled) are statistically significant.

The hierarchical multiple regressions are presented in Table 4. For each of the six measures of health-related behavior (the summary index and its five component measures), the table reports the multiple correlation (*R*), with the coefficient of determination (*RSQ*) in parentheses, for the regression based on the health orientation predictor measures, the *R* and *RSQ* based on the addition of the conventionality-unconventionality measures to the regression equation, and the difference (increment) in the *R* and *RSQ*, which expresses the independent contribution of the conventionality-unconventionality measures to the predictability of the health-

TABLE 2  
Multiple Correlations Between Conventuality-Unconventuality and Health Behaviors, by School Level and Gender

	Junior High School		Senior High School	
	Males <sup>a</sup>	Females <sup>b</sup>	Males <sup>c</sup>	Females <sup>d</sup>
1. Personality conventionality measures predicting:				
Health Behavior Index	.39***	.50***	.35***	.33***
Regular physical activity	.21***	.25***	.23**	.25***
Usual hours of sleep/weekdays	.13	.28***	.20*	.14
Regular safety belt use	.25***	.35***	.24**	.22***
Attention to healthy diet	.33***	.32***	.19*	.29***
Healthful food preferences	.27***	.26***	.31***	.18*
2. Perceived environmental conventionality measures predicting:				
Health Behavior Index	.30***	.44***	.26***	.30***
Regular physical activity	.21***	.28***	.18*	.26***
Usual hours of sleep/weekdays	.10	.31***	.15	.11
Regular safety belt use	.23***	.34***	.29***	.33***
Attention to healthy diet	.20***	.30***	.20*	.17*
Healthful food preferences	.20***	.22***	.13	.03
3. Psychosocial conventionality measures predicting:				
Health Behavior Index	.41***	.53***	.37***	.38***
Regular physical activity	.27***	.33***	.26**	.32***
Usual hours of sleep/weekdays	.15	.34***	.23*	.18
Regular safety belt use	.29***	.39***	.34***	.37***
Attention to healthy diet	.34***	.35***	.24*	.30***
Healthful food preferences	.28***	.30***	.34***	.18
4. Behavioral conventionality measures predicting:				
Health Behavior Index	.29***	.46***	.28***	.36***
Regular physical activity	.14	.21***	.31***	.35***
Usual hours of sleep/weekdays	.17*	.30***	.26***	.19*
Regular safety belt use	.25***	.37***	.25**	.32***
Attention to healthy diet	.20**	.20**	.20*	.21**
Healthful food preferences	.22***	.24***	.33***	.08
5. Overall conventionality measures predicting:				
Health Behavior Index	.43***	.55***	.41***	.42***
Regular physical activity	.29***	.35***	.39***	.40***
Usual hours of sleep/weekdays	.22	.37***	.29*	.25*
Regular safety belt use	.30***	.41***	.35***	.39***
Attention to healthy diet	.36***	.35***	.32**	.30***
Healthful food preferences	.29***	.33***	.44***	.18

<sup>a</sup>*n* = 437. <sup>b</sup>*n* = 464. <sup>c</sup>*n* = 296. <sup>d</sup>*n* = 388.

\**p* < .05. \*\**p* < .01. \*\*\**p* < .001 (by *F* test).

related behaviors. Cohen and Cohen's (1983) general *F* test for increments (Equation 4.4.2) was used to test the significance of this increment in predictability.

In general, and as expected, the multiple correlations based on the more proximal health orientation measures are somewhat larger than the multiple correlations in Table 2 that employed only the measures of overall conventionality-unconventionality. The multiple correlations based on the health orientation measures range from .55 to .60 when the summary index of health-related behavior is the criterion. The key point, however, is that the measures of psychosocial and behavioral conventionality-unconventionality do increase the predictability of the health-related behaviors beyond their predictability from the health orientation measures alone. The addition of the conventionality-unconventionality predictors generally increases the proportion of the variance accounted for on each health-related behavior by .05 to .10. These increments are statistically significant for predictions of variations on the summary index of involvement in health-related

behavior for three of the four subsamples (not for senior high school males). The increments are also significant in all four subsamples for the component measures of regular physical activity and safety belt use and for two of the four subsamples for the component measures of usual hours of sleep and healthful food preferences. Across all six behavior measures, psychosocial and behavioral conventionality-unconventionality accounts for a significant increment in the predictability of the health-related behaviors in two thirds of the analyses. It should be noted that, although the conventionality measures usually added only 5% to 10% to the total variance accounted for, this increment constituted a 34% relative increase, on average, in the variance accounted for over that accounted for by the proximal measures alone.

## DISCUSSION

In this article, we have explored the linkage between psychosocial and behavioral conventionality-unconvention-

TABLE 3  
Correlations Between Health Orientation Measures and the Index of Involvement in Health Behavior,  
by School Level and Gender

Measures of Health Orientation	Index of Involvement in Health Behavior			
	Junior High School		Senior High School	
	Males <sup>a</sup>	Females <sup>b</sup>	Males <sup>c</sup>	Females <sup>d</sup>
Personality system measures				
Value on health	.40***	.35***	.41***	.36***
Health self-description	.35***	.35***	.36***	.34***
Internal health locus of control	.35***	.35***	.25***	.17***
External health locus of control	.00	-.12*	-.16**	-.06
Exercise functions	.31***	.30***	.34***	.28***
Perceived environment system measures				
Maternal modeling of health behavior	.37***	.46***	.26***	.36***
Paternal modeling of health behavior	.40***	.32***	.26***	.31***
Friends' modeling of health behavior	.33***	.18***	.27***	.33***

<sup>a</sup>n = 437. <sup>b</sup>n = 464. <sup>c</sup>n = 296. <sup>d</sup>n = 388.

\*p ≤ .05, two-tailed. \*\*p ≤ .01, two-tailed. \*\*\*p ≤ .001, two-tailed.

TABLE 4  
Independent Contribution of Conventionality-Unconventionality to Predictability of Health Behavior Measures,  
by School Level and Gender

Health Behavior Measures	Junior High School		Senior High School	
	Males <sup>a</sup>	Females <sup>b</sup>	Males <sup>c</sup>	Females <sup>d</sup>
Health Behavior Index				
R (RSQ) on health orientation	.58 (.34)***	.60 (.36)***	.55 (.30)***	.55 (.31)***
R (RSQ) after conventionality added	.62 (.39)***	.68 (.46)***	.59 (.35)***	.60 (.36)***
Increment	.04 (.05)**	.08 (.10)**	.04 (.05)	.04 (.05)**
Regular physical activity				
R (RSQ) on health orientation	.44 (.19)***	.49 (.24)***	.61 (.38)***	.56 (.31)***
R (RSQ) after conventionality added	.49 (.24)***	.53 (.28)***	.65 (.42)***	.61 (.37)***
Increment	.05 (.05)*	.04 (.04)*	.04 (.04)*	.05 (.06)**
Usual hours of sleep/weekdays				
R (RSQ) on health orientation	.14 (.02)	.28 (.08)***	.16 (.03)	.30 (.09)***
R (RSQ) after conventionality added	.26 (.07)	.44 (.19)***	.32 (.11)	.38 (.14)***
Increment	.12 (.05)	.16 (.11)**	.16 (.08)*	.08 (.05)
Regular safety belt use				
R (RSQ) on health orientation	.38 (.14)***	.43 (.19)***	.42 (.18)***	.35 (.12)***
R (RSQ) after conventionality added	.44 (.19)***	.53 (.28)***	.49 (.24)***	.47 (.22)***
Increment	.06 (.05)*	.10 (.09)**	.06 (.06)*	.12 (.10)**
Attention to healthy diet				
R (RSQ) on health orientation	.52 (.27)***	.49 (.24)***	.43 (.19)***	.45 (.20)***
R (RSQ) after conventionality added	.57 (.33)***	.52 (.27)***	.48 (.23)***	.49 (.24)***
Increment	.05 (.06)**	.03 (.03)	.05 (.04)	.04 (.04)
Healthful food preferences				
R (RSQ) on health orientation	.37 (.14)***	.32 (.10)***	.31 (.10)***	.33 (.11)***
R (RSQ) after conventionality added	.42 (.18)***	.40 (.16)***	.49 (.24)***	.37 (.14)***
Increment	.05 (.04)	.08 (.06)**	.18 (.14)**	.04 (.03)

Note. Numbers in parentheses are proportions of the variance (RSQs); significance of increments was determined by Cohen and Cohen's (1983) general F test for an increment (Equation 4.4.2).

<sup>a</sup>n = 437. <sup>b</sup>n = 464. <sup>c</sup>n = 296. <sup>d</sup>n = 388.

\*p < .05. \*\*p < .01. \*\*\*p < .001 (by F test).

ality, an individual differences dimension in problem-behavior theory, and variation in health behavior in adolescence. The findings provide consistent support for such a linkage and, therefore, for the extension of the theory. In general, greater conventionality has been shown to relate to greater involvement in health-maintaining behaviors; stated otherwise,

greater unconventionality is related to less involvement in health-maintaining behaviors. The results are consistent across all three of the explanatory systems of problem-behavior theory (personality, perceived environment, and behavior), across a variety of different health-related behaviors, across two different age samples (junior high school



students and senior high school students), and across both genders.

Although the measures of psychosocial conventionality-unconventionality relate consistently to variation in involvement in the different health-related behaviors, these associations are generally quite modest in size, accounting for about 10% of the variance on the behaviors. This level of correlation, however, is not unexpected given the fact that the personality and perceived environment measures of conventionality are theoretically distal from, and do not directly implicate, the various health-related behaviors.

Given their distal nature, it is possible that the observed relation of the measures of conventionality-unconventionality to health behavior is spurious, or only an indirect relation mediated by variables that are theoretically more proximal to health behavior. This possibility turns out on examination not to be the case. In the hierarchical regression analyses, we found that, for most of the health-related behaviors, the measures of psychosocial conventionality-unconventionality do add a statistically significant increment to the prediction of the health-related behaviors, even when theoretically proximal health orientation measures are forced to enter the regression in a prior step.

It was pointed out recently that:

The unsatisfactory state of theory in the field of adolescent health may well be the most serious obstacle to progress in understanding the nature of adolescent risk behavior and in devising effective approaches to reducing risk and enhancing adolescent health. (R. Jessor, 1984, p. 79)

The present study represents an instance of the application of social-psychological theory to adolescent health behavior. Bringing a particular theoretical perspective to bear has enabled us to illuminate a new source of variation in health behavior—conventionality-unconventionality—and to reveal the linkages of problem and conventional behaviors with health behaviors in an adolescent's repertoire. This approach has made clear that there are, indeed, consistent and systematic relationships between personality and behavior, in this case, between the relatively enduring individual differences in values, beliefs, and attitudes constituting the conventionality-unconventionality dimension of personality, and those behaviors that can influence health.

The findings of the present research generally are consistent with the results of other investigators. For example, Robinson et al. (1987) found that substance use among 10th graders correlated negatively with safety belt use, and positively with both risk-taking behavior and the use of diet pills, laxatives, or diuretics for weight control. A 1984-1985 national survey of Canadian 9-, 12-, and 15-year-olds found that alcohol users, marijuana users, and cigarette smokers were less likely to use safety belts and more likely to take chances by hitchhiking (King, Robertson, & Warren, 1985).

The evidence provided by this study that problem behaviors and conventional behaviors are related to health behaviors may have important ramifications both for theory and for prevention/intervention. Such evidence suggests the need for conceptualizing health behaviors as part of an interrelated and larger system—an adolescent lifestyle—rather than as isolated

and unrelated actions. The concept of lifestyle, in calling attention to the organized patterning of behavior, also suggests that attempts to change any part of that pattern may need to deal with the pattern as a whole. It may well be that behavior-specific intervention or prevention efforts will be less successful than efforts focused on the organized patterning of behavior, that is, on adolescent lifestyles as a whole.

There is a further implication for prevention and intervention. The consistent negative correlations between involvement in cigarette smoking, marijuana use, and problem drinking, on the one hand, and involvement in health-maintaining behavior, on the other, suggest the need for research to determine if a positive orientation to health may serve as a protective factor against the initiation of substance abuse in adolescence.

Finally, and as a cautionary note, the findings showing that unconventionality is linked to less involvement in health-maintaining behavior suggest that those youth who are most unconventional, that is, the so-called high-risk youth, may be in double jeopardy. Not only does their unconventionality place them at greater risk for engaging in health-compromising problem behavior, but it also may lead them to eschew health-maintaining behavior to the extent that the latter is seen as conventional. Insofar as conventionality is linked to the concept of health, those youth who could benefit most from efforts at health promotion may be the very ones most resistant.

The present findings are limited in several ways. First, the use of an active consent procedure resulted in parental permission for only 55% of the selected students to participate in the study. Because of this initial loss, generalization of the present results to the rest of the students in the school district may be unwarranted. Previous research in the area of adolescent problem behavior generally has found that participants tend to be somewhat more conventional than nonparticipants, thereby truncating the range of unconventionality in the sample. The probable impact of this truncation would be to reduce the level of correlations observed, thus rendering them more conservative estimates of the relationships in the larger population of adolescents. A second limitation is the relatively homogeneous nature of the sample of adolescents. The largely Anglo, middle-class composition of the sample may limit the extent to which these results can be generalized to inner-city and/or minority adolescents. Further research in these populations is certainly called for.

A third limitation derives from the employment of several measures of health-related behavior that have still to be fully refined psychometrically and independently validated. A fourth limitation is the exclusive reliance on self-report methods in collecting the data. Had several different sources of data been available for use (e.g., parent interviews, school records, collateral informants, etc.), a greater degree of confidence in the validity of the findings and in their generality might have been attained. Despite these limitations, however, the present findings are consistent and coherent and replicate at both school levels and for both genders. In addition, analyses of other portions of this data set replicate results obtained in both our own earlier research (see Donovan, R. Jessor, & Costa, 1988; R. Jessor & S. L. Jessor, 1977) and in research reported by others.

This extension of problem-behavior theory into the field of adolescent health behavior has demonstrated the significance to health behavior of a major dimension of psychosocial variation, conventionality-unconventionality, and it has shown that health behavior is linked systematically, if only modestly, to a larger system of adolescent behavior. In both respects, understanding of adolescent health behavior would seem to have been advanced.

### ACKNOWLEDGMENTS

This research was carried out as part of a larger project, the Adolescent Health Behavior Study (John E. Donovan, principal investigator), which was funded by National Institute on Drug Abuse (NIDA) Grant DA-03611. The research was done under the aegis of the Research Program on Problem Behavior in the Institute of Behavioral Science at the University of Colorado at Boulder.

We thank the superintendent of schools and the director of research for the school district for their cooperation and support of this research. We also thank Dr. Beatrice Rouse of NIDA for her support and interest in this research.

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