

The Contingent Effects of Risk Perception on Risk-Taking Behavior: Adolescent Participative Orientation and Marijuana Use

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Viewing marijuana use as a risk-taking behavior, we find that the perception of high risk related to regular use of marijuana has no simple direct effect on that risk-taking behavior. Rather, the effect of risk perception is contingent upon the extent of youth participation in activities such as going to parties, going to bars, attending concerts and visiting friends. The perception of risk suppresses marijuana use most effectively in the context of activities where such a risk-taking behavior is most prevalent. These findings are congruent with recent literature on actions of risk-taking that takes into account the subjective meaning orientation as a moderator between perception and action. These lead us to conclude that a behavioral-specific approach can augment the conventional approach to common factors underlying the youths' proneness to problem behaviors.

INTRODUCTION

During the decade of the 1980s, a precipitous decline in marijuana use among American high school seniors occurred (Bachman *et al.*, 1988).

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Use of cocaine among young adults also declined after the mid-1980s (Bachman *et al.*, 1990). Bachman and associates argue that both of these declines resulted from a concomitant increase in the perceived risks related to these two drugs. Although there were other important predictors of individual use of drugs, such as lifestyle variables, Bachman *et al.* did not find any detectable trends in these predictors during the same time periods that could account for the declining use of these drugs. Nor did they find an association between changes in individual use over the 1980s and the decline in use by successive classes of high school seniors during the same observed period. They nonetheless concluded that, whether the knowledge of risks of and attitude toward a specific drug had a direct effect on the behavior at the individual level or not, knowledge and attitude could effectively reduce the aggregate demand at a given period for that drug.

Noting that the heightened awareness of risks of marijuana use might explain only the trend of declining use, without necessarily also explaining individual changes or variations in marijuana use, Bachman and associates recognized that the relationship between risk perception and risk-taking behavior might be more complex than a direct one. How does the individual perception of risks affect the individual's risk-taking behavior? Is risk perception an independent factor preventing one from engaging in a specific risk-taking behavior? Does the effect of risk perception on risk-taking behavior vary depending upon the situational context an individual is in? These are the focal questions we attempt to address in this paper.

Recent literature on adolescent risk-taking behavior has elaborated frameworks of analysis necessary for better understanding the complexity of such behavior. First, subjective estimation of risk, i.e., the probability of occurrence and the severity of adverse outcomes, tend to result from *heuristics*, or one's own constructions, rather than from the law of chance and scientific assessment of the consequences (Kahneman and Tversky, 1972; Kahneman *et al.*, 1982; Lopes, 1993). Social contexts in which an individual lives provide the material from which the individual's heuristics are generated (Heimer, 1988; Lopes, 1993). Also, different social groups have different exposure to public media and other communicative discourse, which define and distribute the amount of risk (Stalling, 1990). It is not clearly delineated how these social influences impact on the perception of risk or also directly on risk-taking action.

Moreover, the interrelationship between risk perception and risk-taking behavior has been recently questioned. Levitt and associates (1991), for example, propose that knowledge of adverse consequences, or perceived risks, would not by itself necessarily prevent risk-taking behavior. Nor would social skills to avoid risky actions always be invoked effectively. The two, knowledge and skill, must be filtered through personal meaning in affecting

outcome risk behavior. Developmentally, the triad of knowledge, skill, and meaning must be in balance at any level of maturity to function effectively in averting adolescent risk-takings.

Others argue that social position or social space accounts for individual variation in the effect of risk perception on behavior (Irwin, 1993; Mazur, 1987; Wildavsky and Dake, 1990; Lee *et al.*, 1994). There are structural-contextual factors that differentiate meaning interpretation and thus mediate the relationship between risk perception and behavior. First, given the same perception of risks (costs of adverse outcome), individual perception of benefits of a risk action can vary on the basis of social associations. A “jock” and a “burnout,” for example, may perceive the same level of harm in marijuana use, but the latter will be more likely than the former to value perceived benefits of use, such as feeling mature and gaining solidarity with fellow burnouts. Additionally, social location determines both one’s sense of efficacy, or personal ability to control, and outcome assessment of alternative risks, which can play a mediating role between risk perception and behavior (Douglas, 1985; Lee *et al.*, 1994; Su, 1995). Mazur (1987) also saw the possibility that social influences other than perception may distinguish a person’s response to a risk (behavior) and that the perception of risks results from these as the person’s verbalized *rationale*. This suggests the possible feedback effect of risk behavior upon perception.

Most previous studies approach drug and drinking behavior among youth as deviant or problem behavior. This approach tends to resort to common factors that explain propensity to engage in deviant behavior or proneness to problem behavior that include not only drug and alcohol use but also truancy, sexual experimentation and other delinquency (Jessor and Jessor, 1977; Kendal, 1980; Jessor, 1984). One of the pivotal common factors explaining the adolescent proneness to problem behavior is the adolescent social space, which defines subcultures of value orientation. Clark (1962) distinguished between “academic” and “delinquent” adolescent subcultures. Matza (1964) categorized value orientations into “studious youth,” “athletic-sports oriented youth,” and “rebellious youth.” Coleman (1987) classified youth by the extent of their integration with adult values—the “peer oriented” and “academic oriented” groups. Ekert (1989) recognized “jocks” and “burnouts” as two categories of youth who embrace or reject mainstream social values. Most recently, Youniss *et al.* (1997), based on youth participation in various activities, distinguished the “school profile,” “party profile,” “sports profile,” “creative profile,” “all-around profile,” and “disengaged profile.” These different kinds of adolescent social networks provide adolescents with a vehicle that allows them to either integrate with the adult and institutional meaning system or reject it (Larson, 1994; Otto, 1976; Rigsby and McDill, 1975).

Proponents of behavior-specific theories, while admitting the explanatory power of common factors of propensity or proneness to problem behavior, would seek to refine the model by differentiating variables that account also for different varieties or stages of behavior (Kendal, 1980; Osgood *et al.*, 1988; Bachman *et al.*, 1988, 1990; Anderson *et al.*, 1993). This approach would lead to questions on subjective values and personal meaning related to an action in a given context. Viewing adolescent problem behavior as a risk-taking action offers one way of addressing these questions.

Direct measures of personal meanings of a risk-taking behavior are rarely obtained from survey data. In what follows we will compare in various adolescent activity contexts the effect of risk perception on the risk-taking behavior of marijuana use in order to infer upon the adolescent interpretations of the meaning of a risk-taking behavior. From the above review of the literature, we expect that perception of high risks (physical or otherwise) regarding regular (as contrasted to "occasional" or "once or twice") marijuana use will have a negative effect on self-reported use. We hypothesize, nonetheless, that the effect of perceived risks in preventing actual use will be altered by the youth's activity orientations. In some activity context risk-taking behavior such as marijuana use, which is perceived as somewhat risky, may be considered "fun." To that extent, the risk perception as well as risk-taking behavior may be reinterpreted in a given activity context. We further hypothesize that the preventive effect of perceived risks of marijuana use will be mediated through differently oriented activities because the risk-taking behavior of marijuana use has different meanings in different contexts of youth activities.

Before presenting results testing the hypotheses above, we turn to a discussion of the data and methods we used.

DATA AND METHODS

The data we used are obtained from the 1992 Monitoring the Future (MTF), a nationally representative annual survey of high school seniors conducted by the University of Michigan's Survey Research Center since 1976 (Bachman *et al.*, 1993). The annual survey uses a multistage sampling procedure to select approximately 135 schools representing the contiguous United States. Four hundred seniors are selected from each school to participate in the survey, all of whom respond to the core questions on drug use, and subsamples of them complete one of the five questionnaire forms that cover various areas of youth lifestyles and values. The variables se-

lected for the present analysis are all derived from Form 2 of MTF, and the valid sample cases are 2613.

Using the 1992 Monitoring the Future data, Youniss *et al.* (1997), as previously noted, delineated four participative orientations from 13 question items assessing the youth's daily activities: (1) measurement of *school* orientation, consisting of 3 items—working on school publications, participating in other school activities, and liking school; (2) measurement of *creative* orientation, consisting of 4 items—spending leisure time alone, creative writing, reading outside of school, and doing arts and crafts; (3) measurement of *sports* orientation, consisting of 2 items—playing sports outside of school and in school; and (4) measurement of *fun* orientation, consisting of 4 items—going to parties, going to bars, attending rock concerts and visiting friends. These authors went on to profile high school seniors according to these four activity orientations, e.g., those scoring high on all orientations are designated as *all-around*, those scoring low on all orientations, *disengaged*, and those medium on all are the *average* group.

Focusing on social integration of adolescents into peer and adult society, Youniss and associates were mainly interested in distinguishing between youth who were engaged in school-sponsored and adult-endorsed activities and those who were mainly involved in peer activities that exclude adults. Marijuana use, in this study, was used as an indicator of rejection of regulation or of shared standards of behavior with adults. The expected negative association between social integration to the adult world and marijuana use was demonstrated, but the approach of this study remains akin to those attempting to explain disposition to act (degree of regulation) rather than an action per se. The question remains whether the two, disposition and action, can be assumed to be directly related.

We use the same set of measures, based on the Youniss *et al.* (1997) factor analysis of the Monitoring the Future data, to indicate adolescents' four activity participative orientations—school, creative, sports, and fun. Rather than grouping youths into these four orientations, we consider that youth can engage themselves in these activities simultaneously and with varying intensities. However, participating in activities of these four different orientations provides settings for youth in interpreting other activities such as the risk-taking behavior of marijuana use. Analytically, we will be testing an interactive model against a linear-additive effects model which has been assumed more often in previous studies (Kendal, 1988). More specifically, we anticipate that the preventive effect of perceived risks of marijuana use on actual behavior will be contingent upon specific activity contexts.

We measure the dependent variable—the risk-taking behavior of marijuana use—by coding the self-reported patterns of use. Abstainers, those

reporting have never used marijuana in their lifetime, are coded as 1; experimenters, those having used marijuana, but not in the last 12 months, are coded as 2; occasional users, those who used marijuana during the last 12 months but not in the last three months, are coded as 3; light users, those who used marijuana on less than 10 occasions during the last three months, are coded 4; and heavy users, those who used marijuana on 10 or more occasions during the last three months, are coded as 5. Of the 2613 valid sample cases, abstainers represent 66.8% of the high school seniors; experimenters, 10.3%; occasional users, 9.7%; light users, 10.0%; and heavy users, 3.1%.

By 1992, very few seniors perceived no or slight risks of regular use of marijuana. In fact, 80% of seniors responded that "regular use of marijuana" poses a great risk. Risk perception of marijuana use, as an independent variable, is thus coded as a dichotomy (1 for great risk and 0 otherwise). Youth daily activities were coded by the reported frequencies of participation: never (1), a few times a year (2), once or twice a month (3), at least once a week (4), and almost everyday (5). Participative orientation to school consists of 3 items, as mentioned earlier, and summated scores thus range from 3 to 15 (mean = 7.50, *SD* = 2.64). Fun orientation is the sum of four items, ranging from 4 to 20 (mean = 10.92, *SD* = 2.41); sport orientation, the sum of 2 items, ranges from 2 to 10 (mean = 6.55, *SD* = 2.62); and creative orientation, the sum of four items, ranges from 4 to 20 (mean = 13.06, *SD* = 2.98). These measures of participative orientation will be used as intervening variables in the following analysis.

RESULTS

Risk perception by itself accounts for about 21% of the variation in risk-taking behavior of marijuana use (Model 1 in Table I). When the four participative orientations—sports, fun, school, and creative—were added to the regression equation, the explained variance of marijuana use was increased to 33% (Model 2 in Table I). All activity orientations except creative significantly affected marijuana use. Unlike the relatively small negative effects of sports and school, fun activities had a distinctively large and positive effect on marijuana use. On the other hand, how do these participative orientations influence risk perception of marijuana use? We regressed the risk perception, as a dependent variable, on the participative orientations, and found that fun also has a substantial negative effect on risk perception (not shown in Table I). In short, under the linear-model specification, the fun orientation has not only a direct effect of increasing marijuana use but also an indirect effect

Table I. Standardized Coefficients and R^2 of Ordinary Least Squares Regression Predicting Marijuana Use Among High School Seniors^a

Independent Variables	Model 1	Model 2	Model 3	Model 4
Perception of Risk (PR)	-.46 ^b	-.34 ^b	.14	
School Activities		-.12 ^b	-.18 ^b	-.11 ^b
Fun Activities		.34 ^b	.53 ^b	.48 ^b
Sports Activities		-.06 ^b	-.10 ^b	-.05 ^b
Creative Activities		.02	.07	
PR × School			.10	
PR × Fun			-.50 ^b	-.35 ^b
PR × Sports			.08	
PR × Creative			-.12	
Adjusted R^2	.21	.33	.34	.34

^aData source: Bachman *et al.* (1993). Data obtained in 1992.

^b $p < .01$.

through suppressing the perception of risk, which is shown to have a strong direct preventing effect on marijuana use (beta = $-.34$).

However, when the interactive effects of risk perception with each of these orientations were added (Model 3, Table I), the net effect of risk perception on marijuana use was rendered statistically insignificant, though the explained variance increased from model 2 only slightly—from 33 to 34%. This suggests that the apparent direct effect of risk perception on marijuana use, under the linear-model specification, must be reconsidered. To understand the nature of the interaction effect, we dropped the insignificant terms in the original interaction regression without compromising the predictive power (Model 4, Table I).

The interaction effect of the perception of risk-level and activity fun-level on risk-taking behavior of marijuana use is illustrated in Fig. 1, where scores for both the sports and school variables are calculated at the average level. As the level of fun activities shifts from high to low, marijuana use declines (the three illustrative lines in Fig. 1). At the high end of fun activities, the perception of regular marijuana use as of great risk would reduce marijuana use from a score of more than 4 (between light and heavy regular use) to less than 3 (quitting or no use during the last 12 months). At the low end of fun activities, however, the effect of risk perception is hardly discernible.

Conversely, the interaction effect can be seen as the dampening effect of fun activities on increasing the risk behavior of marijuana use when it is perceived as a high risk. The contribution of fun activities to increased marijuana use is much higher when such behavior is not perceived as a high risk. In short, in the fun activity context, which is associated with

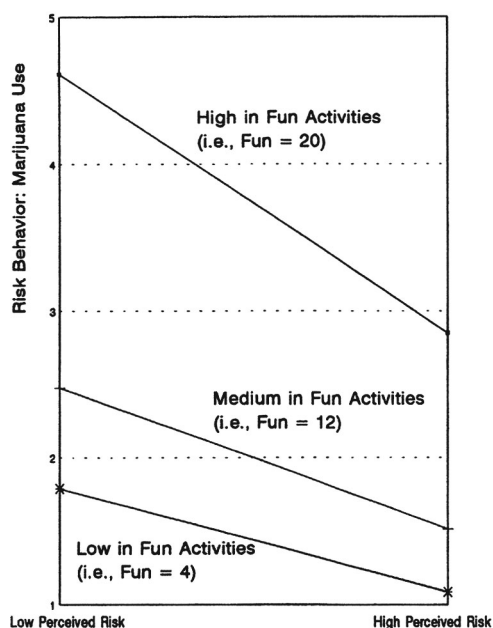


Fig. 1. Effect on risk behavior of the interaction of risk-level perception and activity fun-level.

prevalent use of marijuana, adolescents who perceived marijuana use as a great risk suppressed this risk-taking behavior effectively relative to those who perceived otherwise. Among youth for whom marijuana use is not a salient issue, such as those in a low-fun context, the association between risk-level perception and variation in risk-taking behavior is very weak.

DISCUSSION

The results presented above can be summarized with respect to the hypotheses posed in the earlier section. The perception of high risk related to regular use of marijuana, by itself, is substantially correlated with self-reported use behavior. When activity participative orientations—school, sports, creative, and fun—are introduced, under a linear-model specification, the direct effect of risk perception on risk-taking behavior is not attenuated much. Fun orientation, relative to the other variables, has a strong positive effect on use behavior and, at the same time, a strong negative effect on risk perception. However, when the interactive effect of risk per-

ception with these activity orientations are included in the regression, the significant main effect of risk perception disappears and the interactive effect of risk perception with fun orientation emerges as important. No similar interaction effects are found for school or sports activities with perception of risk.

An investigation of the pattern of this interactive effect reveals that the positive effect of fun activities on marijuana use is greatly suppressed when it is perceived as a great risk. In other words, the preventive effect of risk perception from engaging in the risk behavior of marijuana use is most distinct in the context of a high level of fun. Such an effect diminishes along the continuum of reducing *fun*. To understand this more generally, recent literature on risk perception and risk-taking behavior has almost invariably pointed to the oversimplification of assuming a direct relationship between risk perception and behavior. The importance of personal meaning/orientation as a moderator between risk perception and risk-taking behavior, as introduced by recent researchers of risk behavior (Douglas, 1985; Mazur, 1987; Wildavsky and Dake, 1990; Levitt *et al.*, 1991; Lee *et al.*, 1994; Su, 1995), is borne out by the finding of an interactive effect of risk perception of marijuana use with fun activities of adolescents. On the other hand, in sports and school activities, mostly adult and school sponsored, where marijuana use is not salient, risk perception does not have a contingent effect on the behavior.

The structural factors such as adolescents' social network or subculture, unlike most previous studies of youth approaching these as classifying or typing factors of adolescents' proneness to pro- or antisocial behavior (Clark, 1962; Matza, 1964; Coleman, 1987; Ekert, 1989; Youniss *et al.*, 1997), are viewed in the present study as varying contexts in which youth draw their subjective meanings of a specific action. The empirical data analysis of the present study has been guided by this perspective, though it has not addressed it directly. Extensions from this perspective can open up, for example, the possibility that youth associating with peers who use drugs would not necessarily and uniformly be more inclined to do the same. Or, perception of a certain level of risk may be encouraging rather than discouraging a risk-taking behavior within certain social environments. In this study, marijuana use was perceived as a great risk by the majority of high school seniors in 1992 so that it was limited in this investigation for empirical reasons to a dichotomous contrast of perception of a great risk vs. otherwise. It is conceivable, however, that in another study of adolescent risk behavior that allows for a more differentiated scale of risk perception, a greater variety of effects of risk perception on behavior can be discerned.

More specifically, results of the present study are by no means contradictory to the trend analysis of declining marijuana use during the 1980s. In fact, it buttresses the arguments by Bachman *et al.*, that the declining use is explained not so much by changing lifestyle of the youth as by the increased perception of high risks of marijuana use during the period. More precisely, in light of the present study, fun activities of high school seniors were not lessened during the 1980s, but more among those who were engaged in fun activities perceived marijuana use as of high risk. This effectively reduced the number of serious users.

In this paper, we have demonstrated the contingent effect of risk perception on marijuana use, as a case in point regarding risk-taking. Other behavior-specific risk takings await further research in order to develop more general theories of risk behavior.

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