

AN ABSTRACT OF THE THESIS OF

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Despite recognition in the literature that adolescence represents a relatively high-risk developmental period for health-risk behaviors, only limited attention has been given to the subjective meanings adolescents assign to such behaviors. One potentially fruitful avenue to explore in understanding the adolescent perspective on health-risk behaviors is the use of word association techniques. Word association techniques are an efficient way of determining the content and representational systems of human minds without requiring their expression in the full discursive structure of human language.

A free-association technique was used to provide insight into the meanings adolescents give to a variety of behaviors. Using this technique, 411 high-school students (age range 14-20 years) provided up to five associations

for each of nine behaviors. Six of these behaviors (drinking beer, drinking liquor, smoking cigarettes, smoking marijuana, using cocaine, and having sexual intercourse) were conceptualized as health-risk behaviors. The remaining three behaviors (exercising, using a seatbelt when riding in a car, and using a condom) were conceptualized as health-protective behaviors. Based upon a five-point scale (from 1 = very negative to 5 = very positive), respondents also indicated whether their associations meant something negative or something positive to them. In addition to exploring the subjective meanings adolescents assigned to a variety of behaviors, the study examined whether assigned meanings differed by degree of participation in the behaviors, by gender, and by age.

Results indicated that images associated with adolescent health-risk and health-protective behaviors were linked to the anticipation of specific outcomes. The specific goals of adolescent health-risk behaviors that emerged from this study included: social facilitation, having fun, physiological arousal, relaxation and tension reduction, sexual facilitation, and positive affective change. Given that health-risk behaviors were found to be associated with specific outcomes for adolescents, the present study supported a possible shift in prevention and intervention programs from a problem-focused approach to an approach that offers less destructive alternatives for meeting adolescent needs.

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Adolescent Health-Risk Behavior:
A Study of 15,650 Images

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Adolescent Health-Risk Behavior:

A Study of 15,650 Images

INTRODUCTION

Over the past two decades there has been a renewed interest in the study of adolescence. One important impetus for greater attention to adolescence comes from the recognition that adolescence is a relatively high-risk stage of life for health (Jessor, 1984). Adolescence is a transitional period between childhood and adulthood during which young people experiment with a variety of behavior choices, some of which carry considerable risk for the health of the young person.

Many people begin to experiment with alcohol and illicit drug use in their adolescent years. Data from previous studies indicate that 36% of 12-year-olds have at least experimented with alcohol (McLaughlin, Baer, Pokorny, Burnside, & Fairlie, 1985) and among older (high school age) adolescents, usage rates for alcohol approach 70% for 10th graders and 90% for 12th graders. The National Household Survey on Drug Abuse for 1988 revealed that in the Western United States, nearly 30% of young people aged 12-17 years have used an illicit drug, 6.5% reported using cocaine, and

5.6% used other stimulants (Johnston, O'Malley, & Bachman, 1987).

In addition to alcohol and illicit drug consumption, cigarette smoking represents a significant health problem for adolescents. The rate of adolescent cigarette smoking rose to a peak in 1976-1977 and has been stable since 1981 (Chassin, Pressin, Sherman, & Edwards, 1990). National data show that 26.9% of high school seniors report smoking in the month prior to the survey (Johnston et al., 1987).

Among adolescents, alcohol and drug use has been shown to be correlated with other health-risk behaviors such as sexual risk taking (Donovan, Jessor, & Costa, 1988). During adolescence and young adulthood, many young people initiate sexual activity (Jessor, 1984). By age 15, 20% of all American girls have experienced intercourse; 10% of all sexually active adolescents have had six or more sexual partners (Novello, 1988). In addition, high rates of sexually transmitted diseases are reported among the teenage population, with almost 25% of all cases of sexually transmitted diseases occurring annually among adolescents (Centers for Disease Control [CDC], 1988). From August of 1988 through July of 1990, over 49% of all AIDS cases reported were for young adults from ages 13 through 24 (CDC, 1990). As of April 1991, there were 676 teens diagnosed with AIDS, and 4% of all cases were in persons aged 20 to 24 years. Given the long latency period of this disease, young adults who have the disease were likely to have been infected

while teenagers. Another risk factor during adolescence is unwanted pregnancy. According to the National Center for Health Statistics, 36.5 of every 1,000 women aged 15-17 years gave birth in 1989, the highest rate since the early 1970s (Youngstrom, 1991).

As the above examples indicate, adolescence is a relatively high-risk developmental period for health. Despite the large body of literature on adolescent health-risk taking, few studies have attempted to understand the meaning of these behaviors from an adolescent perspective. One step toward a better understanding of the subjective meaning adolescents give to health-risk behaviors is to explore the emotions and images that underlie them.

Jessor (1984) pointed out that, rather than being arbitrary or fortuitous, adolescent health-risk behaviors are functional, purposive, and instrumental toward the attainment of certain goals. In other words, they carry important personal meanings, symbolic significance, and psychological functions for the young person. Specific symbolic and psychological functions of adolescent health-risk taking are theorized to include the attainment of goals that are blocked or seem otherwise unattainable, expression of opposition to adult authority, coping with feelings such as anxiety or inadequacy, gaining admission to a peer group, confirming attributes of personal identity, symbolizing a developmental transition, and having fun. Although each type of health-risk behavior has its unique

determinants and situational reinforcers (Mechanic, 1979), different health-risk behaviors may be serving similar psychological functions, and, despite their diverse nature, may have common social and personal meanings (Jessor, 1987). The finding that many health-risk behaviors during adolescence tend to be interrelated and to occur as part of a syndrome rather than being a collection of independent activities lends further credence to this observation (Jessor, 1984).

Baumrind (1987) observed that the meaning of young peoples' health-risk taking can shift focus across different historical periods. During the 1960s, health-risk taking predominantly constituted a political statement about young people's relationship to discredited authority. During the 1970s, health risk-taking took on the meaning of conventional recreations. During the 1980s and 1990s, adolescent health risk-taking may be predominantly a way to cope with fears of an uncertain future linked to contemporary socioeconomic realities.

Finally, health risk-taking does not necessarily carry the same meaning for all adolescents. Despite certain developmental similarities, adolescents do not represent a monolithic youth culture but are divided into many subcultures based on similarity of interest and a variety of sociodemographic characteristics such as gender, age, social class, and ethnicity (Brown, 1990). Different subcultures may attribute different meanings to health-risk

taking. For example, those who frequently engage in health-risk behaviors may evaluate these behaviors quite differently than those who less frequently engage in them. Similarly, male and female adolescents as well as adolescents of different age groups may associate different meanings with these behaviors.

The present study used a free association technique to assess the subjective meaning adolescents gave to a variety of health-risk and health-protective behaviors. The primary goals of this study were to replicate commonly cited meanings of adolescent health risk-taking and to explore additional meanings. Specifically, this study was directed at answering the following questions: What subjective meanings do adolescents associate with a variety of health-risk and health-protective behaviors? Do meanings differ by level of participation in these behaviors, gender, and age? The key assumption underlying this study was that by adopting an adolescent-oriented perspective rather than an adult-oriented perspective, it may be possible to reveal nuances of adolescent thinking that might otherwise be detected only by someone who is intimately acquainted with the adolescent world.

REVIEW OF THE LITERATURE

The literature review is presented in three main parts, followed by a review summary, a section describing the purpose of the present study, and a listing of the research questions addressed. The first part of the literature review examines the meaning adolescents associate with health-risk behavior. Specifically, it draws on three bodies of literature (expectancy literature, subjective expected utility literature, and risk perception literature), each of which has provided considerable insight into the ways teenagers think about health-risk behaviors. Following a general overview of each body of literature as it relates to adolescent thinking about health-risk behaviors, the review examines the roles that participation in health-risk behaviors, gender, and age play in modifying the ways adolescents think about health-risk behaviors.

The second part examines the meaning adolescents associate with health-protective behaviors. Although the focus of the proposed study was directed toward health-risk behaviors, attention to health-protective behaviors can add further understanding to the concept of health-risk during adolescence (Jessor, 1984).

The third part of the literature review relates to the finding that health-risk behaviors tend to occur as part of a syndrome, rather than as a collection of independent behaviors (Jessor, 1984). The finding of a behavioral syndrome is important in the context of this study because it suggests that adolescents may attribute similar meanings to different health-risk behaviors, despite the diverse nature of these behaviors.

Meaning of Adolescent Health-Risk Behavior

Outcome Expectancies

Empirical studies that have examined the meaning of adolescent health-risk taking typically have focused on outcome expectancies. As pointed out by Newcomb, Chou, Bentler, and Huba (1988), most research efforts within this area have been concerned with expectancies related to the use of alcohol (e.g., Brown, Christiansen, & Goldman, 1987; Brown, Goldman, Inn, & Anderson, 1980). Alcohol expectancies are defined as concepts of "if-then" relationships between events and objects and their perceived consequences. They are thought to be acquired through direct and vicarious experiences with alcohol and maintained through memory processes (Goldman, Brown, Christiansen, & Smith, in press).

One of the most important goals of the expectancy literature has been the identification of specific expecta-

tions that adolescents have of health-risk behaviors such as alcohol consumption. Expectancy items were usually derived through interviews. Data typically were content analyzed first and then factor analyzed to specify domains of alcohol-related expectancies. Following this approach, Brown et al. (1987) identified seven basic factors in adolescents' alcohol-related expectancies: (a) global positive changes, (b) changes in social behavior, (c) improved cognitive and motor ability, (d) sexual enhancement, (e) cognitive and motor impairment, (f) increased arousal, and (g) relaxation and tension reduction.

More recently, Schafer and Brown (1991) sought to extend the expectancy literature by assessing outcome expectancies associated with marijuana and cocaine. They found that among college students six expectancy factors emerged for marijuana and five expectancy factors emerged for cocaine. The factors for marijuana were: (a) cognitive and behavioral impairment, (b) relaxation and tension reduction, (c) social and sexual facilitation, (d) perceptual and cognitive enhancement, (e) global negative effects, and (f) craving and physical effects. The factors for cocaine were: (a) global positive effects, (b) global negative effects, (c) generalized arousal, (d) anxiety, and (e) relaxation and tension reduction.

One noteworthy finding in the expectancy literature is that different health-risk behaviors produced some similar expectancy factors. For example, expectancies associated

with alcohol, marijuana, and cocaine were found to overlap in their focus on relaxation and tension reduction and global positive and negative effect. Another important factor among identified outcome expectations is physiological arousal, which is linked to sensation seeking (Butler, Gunderson, & Bruni, 1981; McCarty & Kaye, 1984). Zuckerman (1979) described sensation seeking as a personality trait defined by the need for varied, novel, and complex sensations and experiences.

Subjective Expected Utility

Another body of literature that has focused on perceived consequences of health-risk behavior centers around the concept of subjective expected utility (SEU). SEU is a concept frequently used to characterize the weighing of the expected positive and negative consequences of a given behavior (Bauman & Udry, 1981). The expected consequences of behavior are conceptualized as varying along two important dimensions in SEU: Subjective probability and desirability (Gilbert, Bauman, & Udry, 1986). Subjective probability refers to the perceived likelihood that a consequence will occur as a result of a specific behavior. Desirability is the degree to which particular consequences are liked or disliked.

Empirical work based upon the concept of SEU has identified a variety of perceived positive and negative consequences related to numerous health-risk behaviors (e.g.,

smoking, drug usage, sexual behavior). As in the case of outcome expectancy studies, consequence items were usually derived through interviews and subjected to factor analysis. Following this approach, Bauman and Chenoweth (1984) compiled a list of 52 consequences expected from smoking cigarettes among a sample of adolescents. Factor analysis identified six principal factors: (a) negative physical/social consequences, (b) positive peer relationships, (c) negative peer relationships, (d) habit, (e) health, and (f) pleasure.

Bauman and Udry (1981) applied the concept of subjective expected utility to adolescent sexual behavior. This particular study identified a list of 33 positive and negative consequences that adolescents might expect from sexual intercourse. Positive consequences tended to include physical pleasure and satisfaction of curiosity, while negative consequences included parental punishment and fear of pregnancy. The final list of consequences were represented in a measure of SEU.

Perceived Risk

Another body of literature that has contributed to the understanding of the meaning adolescents give to health-risk behaviors is based upon empirical studies of perceived risk. Benthin, Slovic, and Severson (1993) showed that a psychometric paradigm aimed to produce so-called "cognitive maps" of risk attitudes could also be used to examine

adolescents' attitudes toward risk. Previously, such cognitive maps had been used only to investigate perceived risk among college students or adult populations. Within this paradigm, subjects make quantitative judgments about the riskiness of various activities or technologies. Typically, these risk judgments are then related to judgments about a variety of risk characteristics (e.g., controllability or voluntariness) that have been found to influence risk perceptions (Fischhoff, Slovic, Lichtenstein, Read, & Combs, 1978; Slovic, Fischhoff, & Lichtenstein, 1979). Two of the major findings from this early work on risk perception were that perceived risk is quantifiable and predictable and that the concept of risk has different meanings for different people (Slovic, 1987).

The finding that the concept of risk carries different meanings for different people suggested that adolescents might view risk in unique ways that may influence their attitudes toward health-risk behaviors. This suggestion was further substantiated by developmental theorists who proposed that adolescence may present a critical period for distorted risk evaluations. One well-known proponent of this view is Elkind (1967), who suggested that adolescent risk evaluations might be distorted by a so-called "personal fable" of uniqueness and immortality that convinces teenagers that negative consequences only happen to others. The existence of the personal fable has received mixed support from empirical studies. In a recent attempt to test

Elkind's theory, Quadrel, Fischhoff, and Davis (1983) used a quantitative scale to evaluate subjects' perceived vulnerability related to eight risk events (e.g., car accident injury, alcohol dependency, and unplanned pregnancy). The most common response pattern in this study was to see no difference between one's own response level and that faced by targets.

Participation in Health-Risk Behavior

Alcohol expectancy studies with adolescents (Brown, Christiansen, & Goldman, 1987; Christiansen, Goldman, & Brown, 1985; Christiansen & Goldman, 1983; Christiansen, Goldman, & Inn, 1982) have consistently demonstrated a positive relationship between alcohol expectancies and alcohol consumption. In fact, it has been shown that in adolescent samples, expectancies may account for as much as 45%, and expectancies measured one year in advance may still account for as much as 25% of the variance in drinking frequency and quantity (Christiansen, Smith, Roehling, & Goldman, 1989).

Specific expectancies that have been linked to frequency of alcohol consumption include expectations of social facilitation, reduced tension, relaxation, and sensation seeking. In particular, it was found that the expectancy of social facilitation was predictive of occasional drinking in adolescent samples whereas the expectancy of more pharmacologically-linked effects, such as tension

reduction or relaxation were predictive of problem drinking and alcohol dependency (Goldman et al., in press). In addition, adolescent alcohol abusers have been found to expect overall more positive effects from alcohol than demographically comparable non-abusing peers (Brown et al., 1987). Finally, research in the area of outcome expectancies has shown that adolescents who engage in a broad range of health-risk behaviors such as using drugs, driving over the speed limit, and engaging in high-risk sports, tend to prefer high levels of physiological arousal that they expect to result as a consequence of engaging in these activities (Zuckerman, 1983a, 1983b; Zuckerman & Neeb, 1980).

Research in the area of subjective expected utility has also found a relationship between cognition and behavior. In one prominent study, Bauman (1980) asked adolescents how likely each of 54 possible consequences was if they smoked marijuana as well as how attractive or unattractive each consequence would be if it occurred. Bauman found that the consequences that were perceived as being most likely and as most attractive were ones bringing direct and immediate physical and psychological gratification. Bauman devised a formula for combining subjects' probability and attractiveness judgments in a subjective expected utility index, which provided moderate success in predicting adolescents' self-reported use of marijuana. Following a similar approach, Bauman and Udry (1981) found SEU to be moderately predictive of sexual intercourse.

Finally, Bauman and Chenoweth (1984) found the anticipation of pleasure from smoking cigarettes to have an important influence on the onset and maintenance of smoking.

Empirical work in the area of adolescent risk perceptions can be used to complement findings from studies on outcome expectancies and on subjected expected utility. In particular, research in this area has shown that adolescents who frequently engage in health-risk behaviors (e.g., smoking cigarettes, drinking alcohol, etc.) tend to evaluate these behaviors overall as more positive and as carrying more benefits relative to risks than adolescents who infrequently engage in these behaviors (Benthin et al., 1993). A similar finding was obtained by Kandel, Kessler, and Margulies (1978) who found that adolescents who frequently smoke marijuana tended to evaluate the drug as more beneficial and less harmful overall compared to those who did not use it frequently. It was concluded that adolescents who associate more positive meaning with marijuana are more likely to start using it.

The risk perception literature has also been successful in demonstrating the importance of a personal fable in health-risk taking. In support of the personal fable, Finn and Bragg (1986) found that, while young male drivers recognized that their age and gender group has a high risk of being involved in a car accident, they perceived their own risk of being in an accident significantly lower than that of their male peers.

In sum, studies in the area of outcome expectations, subjective expected utility, and risk perception have shown an important association between degree of participation in health-risk behaviors and the cognitive evaluation of these behaviors. The most basic finding in these studies is that adolescents who frequently participate in health-compromising behaviors think more favorably about these behaviors than adolescents who less frequently engage in these behaviors.

Finally, although frequent participants report greater benefits from health-risk behaviors, they do not necessarily differ from less frequent participants regarding anticipated negative consequences. In other words, even among frequent participants there is a recognition of negative consequences of these behaviors (Rohsenow, 1983). Given this finding, it has been suggested that the presence of positive expectancies rather than the absence of negative expectancies most consistently discriminates populations who differ by extent of participation in health-compromising behaviors (Bauman & Chenoweth, 1984; Brown et al., 1987).

Gender and Participation in Health-Risk Behavior

The last two decades have witnessed an increase in health-risk taking among female adolescents (Baumrind, 1987). For example, Chilman's (1983) extensive review of the literature on adolescent sexuality indicated that the

major increase in incidence of sexual intercourse among teenagers has occurred among females. Other health-risk behaviors that have shown a substantial increase among adolescent girls are cigarette smoking and the use of alcoholic beverages (Jessor, 1984).

Do adolescent girls associate different meanings with health-risk behaviors than adolescent boys? Outcome expectancy studies as well as studies on subjected expected utility have shown that adolescent boys and girls do indeed differ in their expectancies related to certain health-risk behaviors. For example, Newcomb et al. (1988) found that adolescent girls were significantly more likely than boys to associate the use of alcohol with the reduction of negative affect such as anxiety and overall tension. Adolescent boys, in turn, were more likely to use marijuana for social-cohesion reasons than were adolescent girls. A similar finding was obtained for cigarette smoking by Urberg and Robbins (1981), who found adolescent boys to be more likely to view smoking cigarettes as a coping mechanism in social situations.

Expectancy studies have further demonstrated that gender differences in thinking about health-risk behavior vary according to the health-risk behavior in question. In particular, it was found that for certain drugs (e.g., cocaine) gender differences were practically non-existent (Schafer & Brown, 1991), whereas for other drugs (e.g., alcohol) gender differences were highly significant (Bauman

& Bryan, 1983). These findings have been used to suggest that gender-role prescriptions may be less defined for some health-risk behaviors than for others (Schafer & Brown, 1991).

One area of health-risk taking that may be especially prone to gender differences in outcome expectations is sexual risk-taking. Bauman and Udry (1981), for example, found that adolescent males associated more positive consequences with sexual behavior than did adolescent girls. These scholars suggested that this finding is related to a social environment that favors sexual behavior more for males than for females. In particular, adolescent males are commonly found to receive more peer encouragement, to accrue more physical pleasure, and to have fewer parental restraints regarding sexual behavior. In comparison, adolescent girls are more likely to suffer from negative consequences of sexual activity such as pregnancy, damaged reputation, and parental discipline.

Research has also shown that adolescent boys and girls approach sexual choices differently. The relative importance males and females ascribe to interpersonal relationships may be central to understanding sexual choices (Gilligan, Lyons, & Hammer, 1990). Gilligan (1982) pointed out that societal norms tend to promote individuality and self-reliance for males and connectedness and intimacy for females. Societal norms may be especially influential during adolescence when the young person is in the process of

establishing an identity (Hill & Lynch, 1983). Given this observation, the meaning of sexual risk-taking for girls may center more around issues of intimacy and affiliation, whereas the meaning of sexual risk-taking for boys may center more around issues of independence and machismo (Gilligan et al., 1990). Issues of independence and machismo in sexual risk taking may be especially important for early adolescent males (Weinstein & Rosen, 1991).

Research in the area of risk perception has also demonstrated important gender differences. In particular, it has been shown that the concept of risk may mean something very different for males than for females. Overall findings indicate that females tend to be more cautious in their risk evaluations than males. Slovic (1966) examined risk-taking behavior in volunteer subjects ranging in age from 6 to 16 years and found that girls were less likely than boys to exhibit risk-taking behavior in a decision-making game at all age levels above 8 years. Differences were significant at ages 11 and 14-16 years. This finding has been supported by more recent studies that have also shown that girls tend to evaluate a variety of tasks as more risky than boys (Hudgens & Fatkin, 1985; Levin, Snyder, & Chapman, 1988). Related specifically to health-risk taking, Saucier and Ambert (1983) found that adolescent girls tended to be more cautious than boys in terms of fastening their seat belts when riding in a car. These authors concluded that this finding may, in part, result

from the fact that fastening ones' seat belt may not be seen as very masculine or heroic for adolescent males.

Further research is needed to establish whether the greater cautiousness of females toward risk is consistent across different tasks and behaviors or whether this finding predominantly occurs in cases in which the task is associated with masculinity. Hill and Lynch (1983) pointed out that with menarche, girls tend to drop culturally prescribed masculine attributes and to become more sensitive toward "gender appropriate" behavior. Given this observation, it may be reasonable to assume that girls evaluate health-risk behaviors that are gender-typed as masculine with more caution and in more negative terms than health-risk behaviors that are gender-typed as neutral or as feminine.

Age Differences and Participation in Health-Risk Behavior

The events, experiences, and processes that characterize the earlier portion of adolescence may be different from those that characterize the later portion of this developmental period (Jessor, 1984). Developmental differences in experience may, in turn, be associated with different meanings and motivations attached to health-risk taking (Brooks-Gunn & Furstenberg, 1989).

This proposition has received only limited attention in the literature. Green (1980) found that older teenagers are significantly less likely than younger ones to associ-

ate the taking up of smoking with social acceptance. Similarly, Jessor (1984) pointed out that younger adolescents may be particularly susceptible to adopting "ready made" symbols of maturity such as smoking cigarettes and drinking alcohol. In other words, for younger more than older adolescents, certain health-risk behaviors may symbolize a transition from "less mature" to "more mature."

Outcome expectancy studies have rarely focused on the notion that outcome expectations and motivations may differ by age. The few empirical efforts on this topic have shown that expectancy formation dates back to childhood (Miller, Smith, & Goldman, in press) and that between 17 and 19 years of age, young peoples' outcome expectations related to certain health-risk behaviors such as the consumption of alcohol become similar to those of adults (Christiansen et al., 1982). Thus, later adolescence has been considered a stage of transition in outcome expectations related to certain health-risk behaviors (Brown et al., 1987).

Newcomb et al. (1988) found age to be related to the expectancy that alcohol and marijuana reduce negative affect. This particular expectation was found to increase with age. Similarly, Christiansen et al. (1985) found alcohol-related expectations for relaxation, enhanced social functioning, and arousal to increase between 12 and 19 years of age and expectations for more global changes to level off during the adolescent years. In addition, Christiansen et al. (1982) found alcohol-related expectations

among adolescents to become more homogeneous and crystallized with age.

Finally, it has been suggested that younger adolescents may evaluate health-risk behaviors in overall more negative terms than older adolescents because younger adolescents tend to experience greater censure from parents as well as from peers for participating in these behaviors. In support of this argument, Gilligan et al. (1990) found that, among a group of adolescent girls, the age guideline of 17 was used to evaluate the appropriateness of sexual activity for peers. Such guidelines may, at least in part, account for lower rates of participation in health-risk behaviors among younger adolescents (Rachel, Williams, & Brehm, 1975).

Meaning of Adolescent Health-Protective Behavior

A key question that has been insufficiently addressed in the literature is how the meaning of health-risk behavior relates to the meaning of health-protective behavior during adolescence. This question is important because the concept of health-risk should reflect the balance between the health-compromising and the health-protective activities in which the person engages (Jessor, 1984).

Health-protective behavior refers to behaviors undertaken in the absence of illness in order to enhance or maintain wellness. Millstein and Litt (1990) have pointed

out that research bearing on the issue of health-protective behavior during adolescence is extremely limited. One of the few studies that have addressed the relation between health-risk and health-protective behavior during adolescence found that persons who reported exercising more, were more likely to wear a seat belt and less likely to smoke cigarettes (Mechanic, 1979).

Chassin, Presson, and Sherman (1989) found that the degree of health-protective behavior among adolescents may vary depending on whether the adolescent engages in "constructive" or "destructive" risk-taking behaviors. In this study, destructive risk-taking was conceptualized as an ongoing form of rebellion and antisociality, whereas constructive risk-taking was conceptualized as a form of experimentation in pursuit of new experiences and was viewed as an indicator of true independence and autonomy. Chassin et al. found that adolescents who engaged in constructive risk-taking engaged in higher levels of health-protective behaviors (e.g., seat belt use and exercise) than adolescents who engaged in destructive risk-taking.

In reference to the meaning adolescents associate with health-protective behavior, Costa, Jessor, and Donovan (1989) suggested that health-protective behaviors during adolescence may be associated with expected outcomes aside from physical well being. In other words, among adolescents physical health may not only be a terminal value in itself, but also an instrumental value relevant to fulfill-

ing other valued goals. These goals, in turn, may vary according to sociodemographic variables such as gender. In support of this view, research has demonstrated that, consistent with existing gender norms, adolescent boys associate exercise more with the expected outcome of being physically fit, whereas adolescent girls are more likely to view exercise as a way to maintain optimal body weight and to improve physical appearance (Costa et al., 1989; Violato & Holden, 1988).

Syndrome of Problem Behavior

Previous research has shown significant positive interrelations among a variety of adolescent health-risk behaviors, including alcohol use, cigarette smoking, marijuana use, use of other illicit drugs, and sexual activity (e.g., Benthin et al., 1993; Donovan & Jessor, 1985; Donovan et al., 1988; Jessor & Jessor, 1977). The finding that many of the health-risk behaviors are interrelated has been used to suggest that they may constitute a behavioral syndrome characterized by an organized constellation of behavior, rather than a collection of independent activities (Jessor, 1984).

Initial support for a problem behavior syndrome was based on a longitudinal study of samples of senior high school and college students (Jessor & Jessor, 1977). This study showed that adolescent health-risk behaviors corre-

lated positively with each other and correlated negatively with more conventional behaviors such as church attendance. More recently, Donovan et al. (1988) sought to replicate the syndrome of health-risk behavior. They found that among 11th and 12th grade students the three health-risk behaviors of problem drinking, marijuana use, and sexual intercourse correlated significantly in the positive direction for both female and male adolescents. Similarly, more conventional behaviors such as satisfactory school performance related negatively and significantly with each of the health-risk behaviors. Donovan et al. hypothesized that an underlying factor that reflects a general dimension of unconventionality in personality and social attributes accounts for the existence of a syndrome of health-risk behavior in adolescence.

Summary and Limitations of the Literature

Empirical attempts to understand the meaning of adolescent health-risk taking have centered around outcome expectancies, subjective expected utility, risk perceptions, and perceived conventionality. One shared contribution of these different bodies of literature is their demonstration that cognition and motivations play important roles in adolescents' health-risk behavior. Another important contribution is their identification of specific

cognitions that have been found to influence participation in these behaviors.

One limitation in these studies is that they have been confined to pre-determined lists of cognitions that may not encompass the wide spectrum of meanings adolescents give to health-risk behaviors. Even when these lists are compiled from cognitions provided in earlier open-ended interviews, subjects who eventually receive these lists may consider only a small portion of the listed cognitions as relevant to their personal experience. Furthermore, lists of cognitions derived through interviews may not include thoughts and ideas that are not easily verbalized due to their subconscious quality (Brown et al., 1980). In addition, a focus on expectancies, consequences, risks, and conventionality may omit other ideas and meanings that may be instrumental in adolescent health-risk taking.

In this context, Jessor (1984) observed that not only are existing listings of the meanings associated with adolescent health-risk taking incomplete, those that have been compiled require further empirical validation. Jessor further suggested that an understanding of the meaning of health-compromising behavior not only helps explain its prevalence, but is also crucial for the design of intervention programs that make available to teenagers alternative and substitute behaviors that are less health-compromising. In other words, understanding adolescents' subjective meanings for health-risk behaviors may lead to alternatives

that fulfill the same or similar functions as the risk behaviors they are intended to replace.

This view is shared by Millstein (1989), who pointed out that despite the high frequency of health-risk behavior among youth, relatively little work has been done to understand young peoples' thinking about these behaviors. To better understand the thoughts and meanings that adolescents associate with health-risk taking, research must take into account the adolescents' perspective (Millstein, 1989; Millstein & Litt, 1990). A final limitation of the literature regarding the meanings adolescents associate with health-risk behaviors is its neglect of the meanings adolescents associate with health-protective behaviors during this developmental period (Jessor, 1984).

One potentially fruitful avenue to exploring and understanding the adolescent perspective on health-risk and health-protective behaviors is the use of word association techniques. In the study of psychological meaning, word association techniques have a long history, reaching back in time to Galton (1880), Wundt (1883), and Freud (1924). They encompass efficient ways of determining the contents and representational systems of human minds without requiring those contents to be expressed in the full discursive structure of human language (Szalay & Deese, 1978). One commonly used word association technique is the so-called free association technique, which allows people to free-associate to a given stimulus word.

Purpose of the Present Study

The purpose of the present study was to use a free association technique as described by Szalay and Deese (1978) to provide better understanding of adolescent perceptions of six health-risk behaviors and three health-protective behaviors. Given the finding that meaning assigned to a given concept may have important behavioral consequences (Slovic, Layman, & Flynn, 1990), the present study aimed at comparisons of the subjective meanings held by adolescents who frequently engage in health-risk taking to those of adolescents with no or only occasional involvement in these behaviors. In addition, gender differences and age differences in assigned meanings were examined. Finally, special attention was paid to possible interaction effects among participation, gender, and age.

Research Questions

Research Question One

Do attitudes about and perceptions of health-risk and health-protective behaviors, as expressed by imagery, differ according to frequency of participation in these behaviors? For example, are adolescents who frequently engage in health-risk behaviors more likely than adolescents who show no or only occasional involvement in these behaviors to associate positive consequences with these behaviors?

Similarly, are adolescents who frequently engage in health-protective behaviors more likely to assign positive consequences to these behaviors than adolescents who show no or only occasional involvement in these behaviors?

Research Question Two

Can participation in a given health behavior (e.g., drinking beer) be predicted from an overall rating score derived from the combined image ratings related to that behavior, gender, and age? Furthermore, can overall participation in health-risk behavior be predicted from an overall rating score derived from the combined image ratings related to all six health-risk behaviors, gender, and age? Similarly, can overall participation in health-protective behavior be predicted from an overall rating score derived from the combined image ratings related to the three health-protective behaviors, gender, and age?

Research Question Three

Do female adolescents associate different meanings with health-risk and health-protective behaviors than do male adolescents? For example, do female adolescents associate health-risk behaviors with more risk or danger than male adolescents? If gender associations are found, do they vary by type of behavior?

Research Question Four

Do female adolescents who frequently engage in health-risk or health-protective behaviors associate different positive outcomes with these behaviors than do male adolescents who frequently engage in these behaviors? If gender associations are found, do they vary by type of behavior?

Research Question Five

Do the data indicate significant associations between age and images assigned to health-risk and health-protective behaviors?

Research Question Six

Do the data indicate significant associations among age, participation, and images assigned to health-risk and health-protective behaviors?

Research Question Seven

Do adolescents who engage in one type of health-risk behavior also engage in other health-risk behaviors? In other words, do the data indicate a syndrome of problem behavior? Similarly, do adolescents who engage in one type of health-protective behavior also engage in other health-protective behaviors? Finally, if such patterns are detected, do they vary by gender or age?

METHODS

Description of the Sample

Subjects were recruited through a high school (Grades 9 through 12) located in a small coastal town in Oregon. The sample consisted of all the students in these classes who attended school on a regular school day ($N=411$). The age range was between 14 and 20 years, of whom 51.7% (209) were female and 48.3% (195) were male. Seven subjects did not report gender. Approximately 77.8% of the participants were Caucasian, 11.9% Native American, 3.6% Hispanic, 1.0% African American, 0.8% Asian American, and 5.1% "other."

Measures

The present study used a free-association technique (Szalay & Deese, 1978) to explore adolescent perspectives on six health-risk and three health-protective behaviors.

Szalay and Deese (1978) pointed out that free associations may allow people to reveal themselves in ways they might find difficult to do if asked to spell out the full propositions behind these associations through answers to questions. Free associations allow researchers to identify

the subjective meaning attached to a large variety of concepts.

Recently, the free-association technique has been revitalized and applied to important social issues (Slovic, Flynn, Layman, 1991a; Slovic, Layman, & Flynn, 1991b). For example, recent research on the perception of environmental risk has illustrated the usefulness of this technique for understanding the meaning of environmental hazards for different groups of people. Slovic et al. (1991b) used the method of free association to evoke images, perceptions, and affective states related to an underground nuclear waste repository. Respondents were asked to indicate the first thoughts or images that come to mind when they think of an underground nuclear waste repository. A sample of 3,334 respondents produced approximately 10,000 word-association images to the repository stimuli. The associations were examined and assigned to 13 superordinate categories (e.g., negative consequences, negative concepts, positive consequences, positive concepts). All but one superordinate category contained subordinate categories. For example, the subcategory "dangerous/toxic" occurred within the superordinate category "negative consequences."

The most important finding established by Slovic et al. (1991b) was that the majority of the images associated with the stimulus "underground nuclear waste repository" were extremely negative. In fact, the two largest superordinate categories "negative consequences" and "negative

concepts," accounted for more than 56% of the total number of images, while the dominant subordinate category "dangerous/toxic" contained almost 17% of all responses. The authors found that, although nuclear waste is a by-product of a technology capable of producing large amounts of energy, almost no positive images were associated with the stimulus.

Another important contribution from studies utilizing word-association techniques lies in their ability to demonstrate the link between imagery and behavior. For example, Slovic, Layman, Kraus, Flynn, Chalmers, and Gesell (1991c) demonstrated the link between subjects' imagery and their preferences for sites in which to vacation. This study found that sites predominantly associated with positive imagery were likely to be preferred as vacation sites compared to sites predominantly associated with negative imagery.

Procedures

Questions asked for the present study were part of a larger questionnaire that consisted of five parts (Appendix A). Subjects completed the questionnaire in their regular classes. Part I of the questionnaire elicited demographic information pertaining to parental marital status, racial background, gender, and age.

Part II of the questionnaire consisted of six scales used to assess adolescent risk perceptions for 12 health-risk behaviors (e.g., drinking beer, smoking cigarettes). In addition, respondents were asked to indicate their level of participation (never/occasionally/frequently) in these health-risk behaviors as well as in a variety of health-protective behaviors (e.g., using a seat belt while riding in a car, exercising) during the previous six months and during the previous week. The three levels of the participation measure were based on recent research in the study of adolescent health-risk behaviors that has indicated the usefulness of distinguishing among abstainers, experimenters, and frequent users (Shedler & Block, 1990). Part III of the questionnaire consisted of an adolescent alcohol expectancy scale to assess adolescent outcome expectancies related to drinking alcohol.

Part IV of the questionnaire pertained specifically to the present study. In this part, respondents were asked to free associate to a total of nine items. These items included six items considered to represent health-risk behaviors and three items considered to represent health-protective behaviors. The health-risk items were drinking beer, drinking liquor (e.g., vodka, mixed drinks), smoking cigarettes, smoking marijuana, using cocaine, and having sexual intercourse. The three health-protective items were exercising, using a seatbelt when riding in a car, and using a condom during sexual activity.

Items were selected according to several criteria, including prevalence, popularity, and presumed importance from a health standpoint. Each of the items was used to elicit a maximum of five associations. Respondents were asked to give all associations related to one stimulus behavior before considering the next. A listing of individual associations is available, upon request, from the author of the present study. Following the elicitation of images, respondents were asked to rate each image on a 5-point scale (1 = very negative, 2 = somewhat negative, 3 = neutral, 4 = somewhat positive, 5 = very positive).

An initial pretest ($N=10$), which used an interview format and included some items not used in the proposed study (e.g., driving drunk), demonstrated that asking respondents to indicate whether a given image held a positive or a negative connotation for them provided important information. In particular, this initial pretest showed that researchers cannot automatically presume to know whether a given image means something positive or something negative to the adolescent. For example, when given the stimulus word "driving drunk," several pretest participants produced the image "dangerous." However, respondents who gave this image differed in their interpretations. In particular, some respondents associated "dangerous" with something very negative, whereas others associated it with something very positive. Thus, it became obvious that asking adolescents to rate their images provided a more comprehensive under-

standing of the meaning they give to health-risk behaviors. A second pretest ($N=10$) confirmed these findings.

Part V of the questionnaire asked respondents to rate the six health-risk behaviors and the three health-protective behaviors using a version of the semantic differential (Osgood, 1952). Bipolar pairs of adjectives for the semantic differential were selected based upon their presumed relevance to adolescents.

Data Analyses

Research Question One

Do attitudes about and perceptions of health-risk and health-protective behaviors, as expressed by imagery, differ according to frequency of participation in these behaviors?

To answer this research question, the content of the images was examined for each behavior and a classification scheme was developed to assign the images to categories. Findings from studies on outcome expectancies, subjective expected utility, and risk perception were used as guidelines for classification. For all nine stimulus behaviors, a distinction between superordinate and subordinate categories was made. One example of a superordinate category was "positive outcomes." Two examples of subcategories within this specific superordinate category were "fun" and "social facilitation." In addition to specific categories, a mis-

cellaneous category was constructed for images that did not fit in any of the other categories. Once different categories of images were established, a numerical value was assigned to each category. These numerical values had no meaning aside from designating a given category.

A contingency table (based on frequencies) for each stimulus behavior was constructed to express the relationship between level of participation (never/occasionally/frequently) in a given behavior and image category. In contingency analysis a large number of cases could result in spurious significance tests. That is, a large number of cases may result in statistical significance when actual associations are relatively small. Thus, a criterion of 10% difference was utilized to identify potentially meaningful differences in proportions. When percentages did not differ by 10% or more, they were considered essentially equal.

Research Question Two

Can participation in a given health behavior (e.g., drinking beer) be predicted from an overall rating score derived from the combined image ratings related to that behavior, gender, and age? Further, can overall participation in health-risk behavior be predicted from an overall rating score derived from the combined image ratings related to all six health-risk behaviors, gender,

and age? Similarly, can overall participation in health-protective behavior be predicted from an overall rating score derived from the combined image ratings related to the three health-protective behaviors, gender, and age?

To answer this research question, a summation model that summed the five-point (negative to positive) ratings for all five images subjects gave in response to given behaviors was generated. Adolescent participation in a given behavior (the dependent variable) was hypothesized to be predictable from the sum of these five image ratings (the independent variable). Slovic et al. (1991c) demonstrated the usefulness of this type of summation model for assessing the relationship between imagery and choice behavior. This study showed that the summation model could be used to predict peoples' preferences for certain vacation sites based on their ratings of the images that they associated with these sites.

A multiple regression model was used to examine the contribution of subjects' summed image ratings, gender, and age to their participation in each health behavior. For example, one respondent rated five images for "drinking beer" in the following manner: fun (somewhat positive = 4); party (neutral = 3); disgusting (somewhat negative = 2); sick (somewhat negative = 2); wreck (very negative = 1). In this example, the subject's overall summation score for five image ratings for "drinking beer" was

$4 + 3 + 2 + 2 + 1 = 12$. This summation score (a continuous variable) as well as gender and age served as the independent variables, whereas participation in "drinking beer" served as the dependent variable. Participation was expressed as a continuous variable (1 = never; 2 = occasionally; 3 = frequently).

To address the question whether a subject's overall participation in a health-risk behavior could be predicted from that subject's combined image rating, gender, and age, an overall index of image ratings for the six health-risk behaviors was created. Similarly, the image ratings associated with the three health-protective behaviors were summed to create an overall index for health-protective behavior. Multiple regression models were used to examine the contribution of each subject's summed image rating, gender, and age (the independent variables) to level of participation (the dependent variable) in health-risk or health-protective behaviors. Again, participation was expressed as a continuous variable (1 = never; 2 = occasionally; 3 = frequently).

To examine the reliability (internal consistency) of the summed image ratings for the six health-risk behaviors and the three health-protective behaviors, Cronbach's alpha was used. Resultant Cronbach's alpha reliability scores were .77 for the health-risk behavior index and .78 for the health-risk ratings index. DeVellis (1991) suggested that alpha values between .70 and .80 can be considered respect-

able. Thus, it was feasible to sum across the six health-risk behaviors to create the health-risk behavior index and across the ratings associated with these behaviors to create the health-risk ratings index.

The reliability scores were only .30 for the health-protective behavior index and .64 for the health-protective ratings index. These values suggest that it was not feasible to sum across the three health-protective behaviors to create the health-protective behavior index, nor to sum across the ratings associated with these behaviors.

Research Question Three

Do female adolescents associate different meanings to health-risk and health-protective behaviors than do male adolescents?

A contingency table was constructed for each stimulus behavior to express the relationship between gender and image category. A 10% difference criterion was used to examine whether image categories were significantly related to gender.

Research Question Four

Do female adolescents who frequently engage in health-risk or health-protective behaviors associate different positive outcomes with these behaviors than do male adolescents who frequently engage in these behaviors?

A contingency table was used for each stimulus behavior to examine the relationships among gender, participation, and image category. A 10% difference criterion was used to examine whether image categories were significantly related to gender and participation.

Research Question Five

Do the data indicate significant associations between age and imagery assigned to health-risk or health-protective behaviors?

A contingency table was used to examine the relationship between age and image category. A 10% difference criterion was used to examine whether this relationship was significant.

Research Question Six

Do the data indicate significant associations between age, participation, and images assigned to health-risk or health-protective behaviors?

A contingency table was used to examine the relationships among age, participation, and image category for each stimulus behavior. A 10% difference criterion was used to examine whether these relationships were significant.

Research Question Seven

Do adolescents who engage in one type of health-risk behavior also engage in other health-risk behav-

iors? In other words, do the data indicate a syndrome of problem behavior? Similarly, do adolescents who engage in one type of health-protective behavior also engage in other health-protective behaviors? Finally, if such patterns are detected do they vary by gender or age?

Product-moment correlations among the six health-risk behaviors and among the three health-protective behaviors were used to examine the presence of behavioral syndromes. Separate correlation analyses for females and males and younger and older adolescents were used to examine whether behavioral patterns differed by gender or by age.

RESULTS

Combined Imagery

The 411 respondents in this study provided a total of 15,650 word-association images to the 9 stimulus behaviors. The greatest number of word-associations ($\bar{n}=1,895$) was given for the stimulus "drinking beer," and the fewest word-associations ($\bar{n}=1,562$) were given for the stimulus "using a condom." The content images of these associations were examined for each stimulus behavior, and a classification scheme was developed to assign the content images to categories. Findings from studies on outcome expectancies, subjective expected utility, and risk perception were used as guidelines for classification.

This content analysis resulted in five general or superordinate categories for each stimulus behavior. All superordinate categories contained subordinate categories. In all, there were 275 distinct categories for the total images. Many of these contained multiple associations, evaluated to have similar meanings. For example, the subcategory "intimacy/affiliation," within the superordinate category "positive outcomes" for having sex, included terms such as intimacy, sharing, togetherness, and closeness. The 58 general or superordinate categories and their 263

subcategories contained 14,005 word-association images. A total of 1,645 (9.5%) images were left uncategorized. For example, for the stimulus behavior "smoking cigarettes," 144 (7.9%) out of a total of 1,822 images were left uncategorized. These images were either ambiguous in content, did not clearly fit into any of the 266 distinct categories for the total images, or did not indicate meaningful categories of their own. Table 1 provides a listing of these images for smoking cigarettes.

Table 2 presents the imagery percentages for each superordinate category by behavior. The superordinate categories revealed a great deal of information about the nature of adolescent images of the nine stimulus behaviors. The most obvious finding was that the different behaviors, despite their diverse nature, could be organized into the same general superordinate categories: positive concepts (e.g., cool, nice), positive outcomes (e.g., fun, social facilitation), negative concepts (e.g., dirty, ugly), negative outcomes (e.g., accident, disease), and miscellaneous (e.g., family references, developmental concepts).

Among the subordinate categories there was also a great deal of similarity. For example, the subordinate category "fun" within the superordinate category "positive outcomes," emerged for seven of the nine stimulus behaviors. The subordinate categories within the superordinate category "miscellaneous" also showed considerable similarity across the different behaviors. In fact, the subordi-

Table 1

Uncategorized Images for "Smoking Cigarettes"

18 Years	Garbage	Responsibility
A	Glad I Don't Anymore	Sarah & I
A Different Person	Green Face	Small
Ash Trays	Hacking	Smoke Rings
Ash Trays	Hobby	Smoke Rings
Ashes	Hot	Smokers
Ashes	Hot	Smokers
Ashes	Inhalation	Smoking Them
Ashes	Inhale	Social Image
Ashes	Inhale	Something To Do
Ashes	Inhale	Style
Ashtray	Inhaling	Tar
Ashtrays	Inhaling	Tar
Associations	Inhaling	Tar
Attitudes	Iron Maiden	Tar
Baby	Is	Tarter
Black	Judy	Tarter
Black	Leather	Taste
Black	Light House	Taste
Blue Smoke	Lighters	Taste
Body	Lips	Taste
Bored	Look	Taste
Boyfriend	Look	Taste
Boyfriend	Looks	Taste
Breezy	Matches	Taste
Brenda	Me	Taste
Bubble Gum	Movies	Taste
Burn	My Ex-Boyfriend	Tension
Carton	My Friends	The Feeling
Choice	Myself	The Taste
Cigarette	Nicotine	This
Cigarette	Nicotine	Tighter
Cigarette Butts	Nicotine	Time
Cigarettes	Nicotine	Tobacco
Cigarettes	Nicotine	TV
Danny Humphrey	Nicotine	Want It
Do it	No Smoking Signs	Want One
Don't Care	No Smoking Signs	White
Don't Care	Non-Smoking Section	Who Cares
Don't Mind	Not Myself	Who Cares
Dry	Nothing	Whore
Dry	Occasional	Whore
Exhale	Others	Why?
Fags	Ouch	Why?
Fake Images	Pack	Yellow
Feeling	People	Yellow
Fresh Air	Puffs	Yellow
Fucking Test	Puffs	Yellow

Table 2

Percentages of Imagery for Each Superordinate Category
by Behavior

	Positive Concepts	Positive Outcomes	Negative Concepts	Negative Outcomes	Misc.	n
Beer	4.8	29.1	23.8	26.8	15.6	1,693
Liquor	5.0	19.7	26.1	32.1	16.8	1,619
Cigarettes	1.8	6.0	33.3	45.1	13.8	1,678
Marijuana	3.1	12.1	36.9	31.9	15.9	1,563
Cocaine	0.8	4.3	47.7	41.6	5.7	1,374
Sex	12.4	42.3	9.6	12.5	23.2	1,479
Condom	46.3	16.7	15.7	16.0	5.4	1,368
Exercise	8.6	49.9	8.3	8.1	24.9	1,703
Seatbelt	19.4	37.5	32.3	4.1	6.7	1,528

nate categories "family," "social models," "developmental concepts," and "syndrome" within the superordinate category "miscellaneous," emerged for all six health-risk behaviors. The subordinate category "family" contained images that referred to family members (e.g., mom, dad, sister). The subordinate category "social models" included images that referred to the media as well as to peers who were engaged in the activity. The adolescents considered for this study gave a total of 52 images directly related to the media. Media-related image associations included commercials, movies, and specific TV characters. The subordinate category "developmental concepts" included images that seemed reflective of developmental changes (e.g., curiosity, experimentation, novelty). Finally, the subordinate category

"syndrome" contained images that referred to a health-risk behavior other than the stimulus behavior. For example, some of the subjects in the present study associated drinking beer with smoking cigarettes or using drugs. Appendix B lists the subordinate categories ordered by frequency within their superordinate categories for each behavior.

Many of the original subordinate categories contained relatively small numbers of images and these subordinate categories were later combined into broader subordinate categories. For example, within the superordinate category "positive outcomes" for "drinking beer," the original six subordinate categories were grouped into emotional, physical, and social outcomes. Appendix C lists the combined subordinate image categories in order of their combined frequencies. As a result of this grouping, the original number of 275 distinct categories for total images was reduced to a total of 84 distinct image categories.

Another noteworthy finding was that all the health-risk behaviors, with the exception of having sex, were predominantly associated with images of a negative quality (Table 3). For example, using cocaine elicited an overwhelming number of negative images ($\underline{n}=1,125$) compared to a relatively small number of positive images ($\underline{n}=70$). In contrast to the other health-risk behaviors, having sex was associated with more than twice as many positive images ($\underline{n}=809$) as negative images ($\underline{n}=327$).

Table 3

Percentages (Frequencies) of Negative Versus Positive Images

	Negative (Concepts & Outcomes)	Positive (Concepts & Outcomes)
Beer	45.3 (857)	30.2 (573)
Liquor	51.9 (944)	22.0 (401)
Cigarettes	72.1 (1,314)	7.2 (131)
Marijuana	68.8 (1,073)	15.2 (240)
Cocaine	89.3 (1,125)	5.1 (70)
Sex	18.8 (327)	46.5 (809)
Condom	27.6 (432)	55.2 (862)
Exercise	14.8 (278)	53.5 (999)
Seatbelt	33.4 (557)	52.3 (870)

The images associated with the three health-protective behaviors (exercising, using a seat-belt, and using a condom) were predominantly positive in tone. For example, using a condom elicited roughly twice as many images with a positive quality (n=862) than images with a negative quality (n=432).

Participation and Imagery

Contingency analysis compared adolescents who had not engaged in a given behavior to those who had frequently participated in a given behavior during the six months preceding the survey. Table 4 presents participation in the nine stimulus behaviors during the six months preceding the survey. Findings showed that frequent participants were

Table 4

Percentages (Frequencies) of Participation in the Nine Stimulus Behaviors During Six Months Prior to Survey

	Never	Occasionally	Frequently
Beer	30.7 (126)	44.5 (183)	24.8 (102)
Liquor	49.1 (202)	35.5 (146)	15.3 (63)
Cigarettes	68.9 (283)	18.2 (75)	12.4 (51)
Marijuana	54.7 (225)	14.1 (58)	20.0 (82)
Cocaine	97.8 (402)	2.2 (9)	--
Sex	50.1 (206)	24.6 (101)	--
Condom ^a	23.4 (48)	37.6 (77)	39.0 (80)
Exercise	13.1 (54)	34.3 (141)	52.3 (215)
Seatbelt	7.1 (29)	12.4 (51)	80.3 (330)

^aSubset includes only those who had sexual intercourse during six months prior to survey (n=205).

significantly more likely than nonparticipants to associate the behavior with positive outcomes and significantly less likely to associate it with negative outcomes (Table 5). For example, 41.4 percent (n=206) of the images given by adolescents who frequently drank beer during the six months preceding the survey indicated an anticipation of positive outcomes from drinking beer. In comparison, only 12.9% (n=73) of the images given by adolescents who never drank beer during the six months preceding the survey indicated an anticipation of positive outcomes. Table 6 provides a listing of the specific positive outcomes associated with the six health-risk behaviors.

Table 5

Percentages (Frequencies) of Imagery for Each Superordinate Category by Participation

	Positive Concepts		Positive Outcomes		Negative Concepts		Negative Outcomes		Miscellaneous		No Category	
	N	F	N	F	N	F	N	F	N	F	N	F
Beer	3.5 (20)	5.4 (27)	12.9 * (73)	41.4 (206)	33.2 * (188)	7.4 (37)	33.2 * (188)	17.3 (86)	11.7 (66)	14.7 (73)	5.5 (31)	13.7 (68)
Liquor	3.2 (27)	6.6 (20)	8.6 * (73)	30.9 (93)	32.1 * (274)	8.0 (24)	35.4 * (302)	23.3 (70)	13.8 (118)	16.6 (50)	6.9 (59)	14.6 (44)
Cigarettes	0.4 (5)	8.1 (18)	2.2 * (28)	21.3 (47)	34.3 * (429)	13.6 (30)	45.6 * (570)	28.5 (63)	11.1 (139)	14.5 (32)	6.2 (78)	14.0 (31)
Marijuana	1.5 (20)	10.4 (10)	5.1 * (69)	49.0 (47)	39.5 * (534)	4.2 (4)	31.9 * (432)	14.6 (14)	14.0 (189)	14.6 (14)	8.0 (108)	7.3 (7)
Sex	8.7 (73)	10.6 (50)	29.3 * (245)	41.9 (198)	12.0 (100)	3.4 (16)	13.2 (110)	8.0 (38)	23.3 (195)	18.0 (85)	13.4 (112)	18.0 (85)
Condom ^a	24.5 * (48)	48.2 (149)	5.6 * (11)	15.5 (48)	23.0 * (45)	11.3 (35)	28.0 * (55)	10.0 (31)	3.0 (6)	3.9 (12)	15.8 (31)	11.0 (34)
Exercise	6.4 (15)	8.3 (82)	29.9 * (70)	50.9 (501)	23.5 * (55)	4.4 (43)	10.7 (25)	5.0 (49)	17.5 (41)	24.0 (236)	12.0 (28)	7.4 (73)
Seatbelt	11.3 (13)	18.8 (251)	20.9 * (24)	37.3 (497)	44.3 * (51)	26.7 (356)	7.8 (9)	3.1 (42)	1.7 (2)	6.6 (88)	13.9 (16)	7.4 (99)

Note. * = Minimum 10% difference between nonparticipants and frequent participants. N = no participation during six months prior to survey; F = frequent participation during six months prior to survey. No respondents participated frequently in the use of cocaine.

^aSubset: Includes only those who had sexual intercourse during the six months prior to the survey (n=205).

Table 6

Percentages (Frequencies) of Imagery for Subordinate Categories Within Superordinate Category "Positive Outcomes" by Health-Risk Behaviors

Positive Outcomes	Beer	Liquor	Cigar.	Marij.	Cocaine	Sex
Social						
Fun/Pleasure	30.1 (148)	25.0 (80)	11.8 (12)	25.6 (49)	10.2 (6)	41.0 (257)
Social Facilit.	45.0 (221)	44.2 (141)	38.2 (39)	24.6 (47)	37.3 (22)	2.5 (16)
Love/Romance	--	--	--	--	--	16.6 (104)
Sexual Facilit.	4.7 (23)	8.8 (28)	--	4.2 (8)	8.5 (5)	--
Intimacy/Affil.	--	--	--	--	--	7.8 (49)
Physical						
Arousal	7.1 (35)	10.3 (33)	16.7 (17)	5.7 (11)	35.6 (21)	16.6 (104)
Relaxation	6.7 (33)	5.0 (16)	33.3 (34)	27.2 (52)	--	1.9 (12)
Physical Gratif.	--	--	--	--	--	4.9 (31)
Emotional						
Pos. Aff. Change	6.3 (31)	6.5 (21)	--	11.5 (22)	8.5 (5)	8.5 (53)
Other	--	--	--	1.0 (2)	--	--

With regard to negative outcomes, the pattern was reversed. Only 17.3% ($\underline{n}=86$) of the images given by adolescents who frequently drank beer indicated an anticipation of negative outcomes from the behavior compared to 33.2% ($\underline{n}=188$) of the images given by adolescents who never drank beer during the six months preceding the survey. A similar observation could be made for condom use. Specifically, only 10% ($\underline{n}=31$) of the images given by adolescents who frequently used a condom during intercourse associated nega-

tive outcomes with the behavior compared to 28% ($n=55$) of the images given by adolescents who never used a condom during intercourse in the six months preceding the survey. Specific negative outcomes associated with condom use included physical discomfort and inconvenience, reduced pleasure and intimacy, mood interruption, and embarrassment. Table 7 provides a listing of the specific negative outcomes associated with the three health-protective behaviors. In sum, the general pattern of association between level of participation and imagery suggested a gradual

Table 7

Percentages (Frequencies) of Imagery for Subordinate Categories Within Superordinate Category "Negative Outcomes" by Health-Protective Behaviors

Negative Outcomes	Condom	Exercise	Seatbelt
Social			
Embarrassment	11.4 (25)	--	--
Social Stigma	--	--	25.0 (16)
Reduced Intimacy	5.9 (13)	--	--
Physical			
Fatigue	--	64.2 (88)	--
Pain	--	24.8 (34)	--
Death	--	--	34.4 (22)
Being Trapped	--	--	26.6 (17)
Health Risks (Gen.)	--	--	14.1 (9)
Physical Discomfort	38.3 (84)	--	--
Reduced Pleasure	28.8 (63)	--	--
Emotional			
Interrupts Mood	10.9 (24)	--	--
General	4.5 (10)	10.9 (15)	--

increase in anticipated positive outcomes and a gradual decrease in anticipated negative outcomes with increasing participation level (Table 8).

Another noteworthy finding was that frequent participants rated their positive outcomes in more favorable terms than non-participants (Table 9). For example, adolescents who frequently drank beer during the six months preceding the survey rated 68.8% ($n=139$) of their 202 images related to positive outcomes as "very positive." In comparison, adolescents who never drank beer during the six months preceding the survey rated only 27.4% ($n=20$) of their 73 images related to positive outcomes as "very positive."

Contingency tables revealed the following additional associations in subordinate categories by level of participation. Frequent beer and liquor drinkers were significantly more likely than nondrinkers to associate these behaviors with positive social outcomes. Specifically, frequent beer drinkers were more likely to associate the behavior with social facilitation and with having fun and less likely to associate it with negative physical outcomes.

Frequent marijuana users and occasional cocaine users were also significantly more likely to associate these behaviors with positive social outcomes, and frequent marijuana users were less likely to associate it's use with negative physical outcomes. Specifically, frequent marijuana users were more likely to associate the behavior with

Table 8

Percentages (Frequencies) for Negative Versus Positive Outcomes by Participation

	Never		Occasionally		Frequently	
	NO	PO	NO	PO	NO	PO
Beer	33.2 (188)	12.9 (73)	21.6 (180)	25.5 (212)	17.3 (86)	41.5 (206)
Liquor	35.4 (302)	8.6 (73)	22.2 (148)	23.0 (153)	23.3 (70)	30.9 (93)
Cigarettes	45.6 (570)	2.2 (28)	34.1 (117)	7.9 (27)	28.5 (63)	21.3 (47)
Marijuana	32.0 (432)	5.1 (69)	20.4 (52)	29.4 (75)	14.6 (14)	49.0 (47)
Cocaine	36.6 (561)	3.1 (48)	27.8 (10)	30.6 (11)	--	--
Sex	13.2 (110)	29.3 (245)	8.5 (37)	42.2 (183)	8.1 (38)	42.0 (198)
Condom	28.1 (55)	5.6 (11)	17.7 (54)	15.7 (48)	10.0 (31)	15.5 (48)
Exercise	10.7 (25)	29.9 (70)	9.8 (63)	43.2 (279)	5.0 (49)	50.9 (501)
Seatbelt	7.8 (9)	20.9 (24)	6.2 (13)	25.2 (53)	3.2 (42)	37.3 (497)

Note. NO = negative outcomes; PO = positive outcomes.

Table 9

Percentages (Frequencies) of Imagery for "Positive Outcomes" Rated as "Very Positive" by Participation

	No Partici- pation	Frequent Participation
Health-Risk Behaviors		
Beer	27.4 (20)	68.8 (139)
Liquor	28.8 (21)	85.6 (77)
Cigarettes	25.0 (7)	42.6 (20)
Marijuana	19.4 (13)	80.9 (38)
Cocaine ^a	47.9 (23)	--
Sex	77.0 (187)	89.9 (178)
Health-Protective Behaviors		
Condom	70.0 (7)	85.4 (41)
Exercise	67.1 (47)	91.0 (454)
Seatbelt	83.3 (20)	87.7 (434)

^aNo respondents participated in the frequent use of cocaine.

the positive social outcome of having fun. In addition, frequent marijuana users and occasional cocaine users were significantly more likely to associate the behavior with positive physical outcomes such as relaxation.

The expectation of physical relaxation was also higher among frequent cigarette smokers compared to nonsmokers. In addition, frequent cigarette smokers were significantly less likely than nonsmokers to associate the behavior with negative social outcomes, in particular with social stigma (e.g., scummy, ugly, turn-off, unattractive, and uncool).

Finally, frequent exercisers and seat-belt users were significantly more likely than nonparticipants to associate

these behaviors with positive physical outcomes. For example, frequent exercisers gave a significant number of images related to improved physical health and physical appearance and frequent seat belt users pointed to the physical safety and protection qualities of seat belt use.

Behavior Preferences and Imagery

In predicting behavior preferences from images, all nine regression models were significant (Table 10). Furthermore, for seven of the nine behaviors, the summation index was the strongest predictor. For example, using regression analysis to predict participation in drinking beer from the summation ratings index, age, and gender resulted in a significant overall equation ($F(3,384) = 56.38, p = .0001$) in which the summation index ($\beta = .51, p = .0001$) and age ($\beta = .14, p = .0012$) were significantly associated with participation. Gender was not a significant predictor for participation in drinking beer.

The summation index was not the strongest predictor for participation in using a seat-belt or having sex. In the case of having sex, the summation index ($\beta = .28, p = .0001$) and age ($\beta = .32, p = .0001$) were equally significant in predicting participation. Thus, older adolescents who gave more positive affective ratings of their images were more likely to have sex. In the case of seat-

Table 10

Standardized Regression Coefficients for Participation in Nine Behaviors

Predictor Variables	Beer	Liquor	Cigarettes	Marijuana	Cocaine	Sex	Condom	Exercise	Seatbelt
Summation Index	.51****	.55****	.32****	.52****	.16**	.28****	.26**	.43****	.08
Gender	-.00	.05	-.15**	-.00	-.08	-.07	.18*	.03	-.18***
Age	.14***	.13**	.06	.05	.06	.32****	-.11	-.10*	-.09
R ²	.306	.337	.130	.275	.305	.205	.097	.191	.052
Adjusted R ²	.300	.331	.123	.269	.027	.199	.082	.184	.045

*p < .05. **p < .01. ***p < .001. ****p < .0001.

belt usage, gender was the only significant predictor for participation ($\beta = -.18$, $p = .001$). Adolescent girls were significantly more likely to wear a seatbelt than adolescent boys.

Using regression analysis to predict overall participation in health-risk behavior from combined image ratings, gender, and age resulted in a significant overall equation ($F(3,387) = 62.44$, $p = .0001$). The overall indices for image ratings ($\beta = .51$, $p = .0001$) and age ($\beta = .20$, $p = .0001$) were significantly associated with the subjects' overall participation in a health-risk behavior. Gender was not a significant predictor for overall participation in health-risk behaviors (Table 11).

Table 11

Standardized Regression Coefficients
for Overall Participation in Health-
Risk or Health-Protective Behaviors

Predictor Variables	Risk Behaviors	Protective Behaviors
Overall Risk Image Ratings Index	.51****	.21**
Age	.20****	-.07
Gender	-.04	.02
R^2	.33	.05
Adjusted R^2	.32	.03

** $p < .01$. **** $p < .0001$.

Finally, using regression analysis to predict overall participation in health-protective behavior from the combined image ratings associated with that behavior, gender,

and age resulted in a significant overall equation ($F(3,189) = 3.23, p = .02$). Only the overall index of image ratings ($\beta = .21, p = .003$) was significant in predicting a subject's overall participation in health-protective behaviors. Neither gender nor age were significant predictors for overall participation in health-protective behavior (Table 11). In interpreting these results, it is important to point out that the internal consistency score for the health-protective behavior index was only .30 and for the health-protective ratings index was only .64.

Gender and Imagery

Table 12 provides an overview of the percentages (frequencies) of images given in each superordinate category by gender. A Chi-square analysis showed no significant associations among superordinate, subordinate, or combined subordinate image categories and gender. For example, female adolescents were not significantly more likely than male adolescents to associate health-risk behaviors with negative outcomes.

Gender, Participation and Imagery

Gender and participation were associated with superordinate, subordinate, and combined subordinate image categories (Table 13). Female adolescents, compared to male

Table 12

Percentages (Frequencies) of Imagery for Each Superordinate Category by Gender

	Positive Concepts		Positive Outcomes		Negative Concepts		Negative Outcomes		Miscellaneous		No Category	
	F	M	F	M	F	M	F	M	F	M	F	M
Beer	3.8 (37)	5.1 (45)	26.2 (258)	25.4 (223)	24.1 (237)	18.6 (163)	24.5 (241)	23.2 (202)	12.9 (127)	14.8 (130)	8.5 (84)	12.9 (113)
Liquor	5.5 (53)	3.5 (29)	17.2 (165)	18.1 (150)	23.6 (226)	22.9 (189)	29.2 (280)	27.1 (224)	15.2 (146)	15.0 (124)	9.2 (88)	13.4 (111)
Cigarettes	1.8 (17)	1.5 (12)	7.3 (71)	3.4 (28)	28.9 (281)	32.5 (265)	41.1 (400)	42.1 (343)	13.3 (129)	12.4 (101)	7.7 (75)	8.1 (66)
Marijuana	3.1 (29)	2.6 (19)	11.8 (110)	9.9 (74)	34.7 (322)	32.4 (241)	27.7 (257)	31.1 (232)	15.1 (140)	14.4 (107)	7.6 (71)	9.7 (72)
Cocaine	0.8 (7)	0.6 (4)	4.7 (41)	2.7 (18)	41.2 (358)	42.0 (283)	36.5 (317)	35.8 (241)	5.1 (44)	5.0 (34)	11.6 (101)	14.0 (94)
Sex	9.0 (83)	12.0 (94)	34.0 (313)	38.0 (299)	10.0 (92)	6.0 (47)	12.8 (118)	8.0 (63)	24.5 (226)	14.8 (116)	10.0 * (89)	21.3 (167)
Condom	41.6 (353)	39.3 (269)	17.0 (144)	12.0 (82)	13.4 (114)	13.7 (94)	12.3 (104)	15.5 (106)	4.3 (36)	5.6 (38)	11.4 (97)	13.9 (95)
Exercise	8.3 (81)	7.4 (63)	49.9 (488)	40.2 (344)	6.8 (67)	8.7 (74)	7.2 (70)	7.6 (65)	21.0 (206)	24.9 (213)	6.8 (67)	11.2 (96)
Seatbelt	19.2 (171)	16.4 (122)	36.5 (326)	31.4 (234)	27.9 (249)	32.0 (238)	3.3 (29)	4.7 (35)	7.2 (64)	4.7 (35)	6.1 (54)	10.9 (81)

Note. * = Indicates 10% difference. F = female; M = male.

Table 13

Percentages (Frequencies) of Imagery for Each Superordinate Category by Frequent Participation and Gender

	Positive Concepts		Positive Outcomes		Negative Concepts		Negative Outcomes		Miscellaneous		No Category	
	F	M	F	M	F	M	F	M	F	M	F	M
Beer	4.8 (10)	6.2 (17)	40.7 (85)	42.1 (115)	11.5 (24)	4.0 (11)	17.2 (36)	17.6 (48)	12.9 (27)	16.1 (44)	12.9 (27)	13.9 (38)
Liquor	10.2 (12)	4.6 (8)	28.8 (34)	33.5 (58)	6.8 (8)	8.7 (15)	22.9 (27)	21.4 (37)	17.8 (21)	16.2 (28)	13.6 (16)	15.6 (27)
Cigarettes	6.5 (11)	13.7 (7)	22.9 (39)	15.7 (8)	11.2 * (19)	21.6 (11)	28.2 (48)	29.4 (15)	16.5 * (28)	7.8 (4)	14.7 (25)	11.8 (6)
Marijuana	12.3 (8)	6.5 (2)	52.3 * (34)	41.9 (13)	3.1 (2)	6.5 (2)	10.8 * (7)	22.6 (7)	16.9 (11)	9.7 (3)	4.6 (3)	12.9 (4)
Sex	9.3 (26)	11.6 (20)	41.9 (117)	41.0 (71)	4.7 (13)	0.6 (1)	9.3 (26)	6.4 (11)	25.5 * (71)	8.1 (14)	9.3 * (26)	32.4 (56)
Condom	50.0 (70)	46.3 (76)	23.6 * (33)	9.2 (15)	11.4 (16)	12.0 (19)	7.1 (10)	12.2 (20)	2.1 (3)	5.5 (9)	5.7 * (8)	15.2 (25)
Exercise	8.6 (43)	8.1 (38)	55.3 (277)	45.9 (215)	3.8 (19)	5.13 (24)	5.0 (25)	5.1 (24)	21.4 (107)	26.7 (125)	6.0 (30)	9.0 (42)
Seatbelt	19.2 (149)	18.7 (99)	38.1 * (296)	25.3 (187)	26.1 (203)	27.7 (147)	2.8 (22)	3.8 (20)	7.6 (59)	5.1 (27)	6.3 (49)	9.4 (50)

Note. * = Indicates 10% difference. F = females who frequently participated; M = males who frequently participated. No respondents participated frequently in the use of cocaine.

adolescents, who had frequently or occasionally engaged in smoking marijuana during the six months preceding the survey, were significantly more likely to associate the behavior with positive outcomes and significantly less likely to associate it with negative outcomes. Specifically, adolescent girls who frequently smoked marijuana, compared to adolescent boys who frequently smoked marijuana, were significantly more likely to associate smoking marijuana with positive emotional outcomes, in particular with positive affective change, and significantly less likely to associate the behavior with negative physical outcomes.

Female adolescents who occasionally used cocaine were significantly more likely to associate the behavior with positive outcomes and significantly less likely to associate it with negative concepts. Similarly, adolescent girls who frequently smoked cigarettes, compared to frequent male smokers, were significantly less likely to associate the behavior with negative concepts.

Female adolescents who had frequently used a condom when having sex were significantly more likely to associate it with positive outcomes, in particular positive physical outcomes, compared to adolescent boys who had frequently used a condom. Finally, female adolescents who had not worn a seatbelt during the six months preceding the survey were also significantly more likely to associate the behavior with positive concepts and positive outcomes, in parti-

cular safety and protection, than adolescent boys who had not worn a seatbelt.

In sum, female participants, in smoking marijuana, using cocaine, or using a condom, were significantly more likely than male participants to associate positive outcomes with these behaviors.

Age and Imagery

Contingency tables for the nine stimulus behaviors were constructed to compare younger adolescents (14-16 years) and older adolescents (17-20 years) in their image categories. These tables were based upon the use of the 10% difference criterion for the examination of associations between age and imagery. Superordinate, subordinate, and combined subordinate image categories showed no significant associations between age and imagery. In other words, younger adolescents did not significantly differ from older adolescents in the meanings assigned to the six health-risk or the three health-protective behaviors. Table 14 shows the percentages (frequencies) of images given in each superordinate category by age group.

Age, Participation, and Imagery

Contingency tables showed the following associations among age, participation, and image categories. Compared to older adolescents (17-20 years) who frequently smoked

Table 14

Percentages (Frequencies) of Imagery for Each Superordinate Category by Age

Age Groups	Positive Concepts		Positive Outcomes		Negative Concepts		Negative Outcomes		Miscellaneous		No Category	
	14-16	17-20	14-16	17-20	14-16	17-20	14-16	17-20	14-16	17-20	14-16	17-20
Beer	5.1 (58)	3.2 (24)	23.9 (271)	28.2 (208)	24.5 (278)	16.7 (123)	25.3 (287)	21.4 (158)	12.2 (138)	16.9 (125)	8.9 (101)	13.5 (100)
Liquor	4.9 (53)	4.0 (29)	17.7 (190)	17.0 (123)	24.2 (259)	22.2 (161)	29.1 (312)	27.0 (196)	14.3 (153)	16.5 (120)	9.7 (104)	13.2 (96)
Cigarettes	1.9 (21)	1.1 (8)	4.9 (53)	6.5 (46)	30.8 (335)	30.6 (217)	43.3 (472)	38.9 (276)	12.0 (131)	14.0 (99)	7.1 (77)	8.9 (63)
Marijuana	2.7 (28)	3.2 (21)	11.3 (116)	10.9 (72)	34.9 (359)	31.3 (206)	29.7 (305)	28.5 (188)	13.9 (143)	16.1 (106)	7.5 (77)	10.0 (65)
Cocaine	0.9 (9)	0.3 (2)	3.9 (38)	3.6 (21)	39.6 (383)	44.9 (262)	37.6 (364)	33.6 (196)	5.6 (54)	4.3 (25)	12.3 (119)	13.2 (77)
Sex	10.6 (110)	9.6 (65)	33.9 (353)	39.0 (263)	9.4 (98)	6.1 (41)	13.0 (135)	7.1 (48)	20.2 (211)	19.6 (132)	13.0 (135)	18.7 (126)
Condom	42.3 (395)	37.7 (229)	16.4 (153)	11.8 (72)	12.5 (117)	15.1 (92)	12.3 (115)	16.6 (101)	5.0 (47)	4.4 (27)	11.4 (106)	14.3 (87)
Exercise	8.4 (94)	6.7 (49)	47.3 (529)	42.4 (309)	7.9 (88)	7.3 (53)	8.0 (90)	6.2 (45)	20.2 (226)	27.3 (199)	8.1 (91)	10.0 (73)
Seatbelt	19.6 (194)	14.9 (98)	35.0 (346)	33.4 (220)	28.1 (278)	32.1 (211)	3.1 (31)	5.0 (33)	6.3 (62)	5.8 (38)	7.8 (77)	8.8 (58)

cigarettes during the six months preceding the survey, younger adolescents (14-16 years) who frequently smoked cigarettes were significantly more likely to associate the behavior with positive concepts (Table 15). Compared to older adolescents who frequently used marijuana or drank liquor during the six months preceding the survey, younger adolescents who frequently used marijuana or drank liquor were significantly more likely to associate the behavior with positive outcomes. Specifically, younger adolescents who frequently used marijuana were significantly more likely to associate the behavior with positive emotional outcomes, in particular with positive affective change, compared to older adolescents who had frequently used this substance. In addition, younger adolescents who frequently used marijuana were significantly less likely than older adolescents who frequently smoked to associate the behavior with getting high.

Younger adolescents who occasionally used cocaine were significantly less likely than older adolescents to associate the behavior with negative concepts and significantly more likely to associate it with positive outcomes, in particular positive physical and social outcomes. For example, compared to older adolescents who had occasionally used cocaine, younger adolescents who occasionally used cocaine were significantly more likely to associate the behavior with the positive physical outcome of arousal (e.g., excitement and stimulation).

Table 15

Percentages (Frequencies) of Imagery for Each Superordinate Category by Frequent Participation and Age

Age Groups	Positive Concepts		Positive Outcomes		Negative Concepts		Negative Outcomes		Miscellaneous		No Category	
	14-16	17-20	14-16	17-20	14-16	17-20	14-16	17-20	14-16	17-20	14-16	17-20
Beer	7.1 (15)	4.5 (12)	41.4 (87)	40.7 (109)	8.6 (18)	6.3 (17)	15.7 (33)	17.5 (47)	13.8 (29)	16.4 (44)	13.3 (28)	14.6 (39)
Liquor	8.9 (13)	4.8 (7)	35.6 * (52)	25.3 (37)	4.1 (6)	11.6 (17)	19.9 (29)	26.0 (38)	15.8 (23)	17.8 (26)	15.8 (23)	14.4 (21)
Cigarettes	14.2 * (15)	2.6 (3)	21.7 (23)	20.9 (24)	14.2 (15)	13.0 (15)	32.1 (34)	25.2 (29)	6.6 * (7)	21.7 (25)	11.3 (12)	16.5 (19)
Marijuana	9.9 (7)	12.0 (3)	52.1 * (37)	40.0 (10)	4.2 (3)	4.0 (1)	16.9 (12)	8.0 (2)	12.7 (9)	20.0 (5)	4.2 * (3)	16.0 (4)
Sex	10.8 (19)	9.4 (27)	40.3 (71)	42.3 (121)	3.4 (6)	3.5 (10)	10.2 (18)	7.0 (20)	18.8 (33)	18.2 (52)	16.5 (29)	19.6 (56)
Condom	46.5 (66)	49.7 (83)	17.6 (25)	13.8 (23)	12.7 (18)	10.2 (17)	9.2 (13)	10.8 (18)	4.9 (7)	3.0 (5)	9.2 (13)	12.6 (21)
Exercise	8.8 (54)	7.2 (26)	53.7 (331)	45.8 (165)	4.7 (29)	3.9 (14)	5.8 (36)	3.6 (13)	20.1 * (124)	31.1 (112)	7.0 (43)	8.3 (30)
Seatbelt	20.1 (162)	16.7 (85)	36.4 (294)	38.4 (195)	26.5 (214)	27.2 (138)	2.9 (23)	3.7 (19)	6.9 (56)	6.1 (31)	7.3 (59)	7.9 (40)

Note. * = Indicates 10% difference. No respondents participated frequently in the use of cocaine.

Compared to older adolescents who did not use a seatbelt, younger adolescents who did not use a seatbelt were significantly less likely to associate the behavior with negative concepts and significantly more likely to associate it with positive outcomes. In addition, younger adolescents who occasionally used a seatbelt were significantly more likely than older adolescents who occasionally used a seatbelt to associate it with positive concepts. No significant age differences were found for frequent users.

In conclusion, compared to older adolescents, younger adolescents were more likely to associate positive outcomes or concepts with smoking cigarettes, smoking marijuana, using cocaine, drinking liquor, and using a seatbelt.

Behavior Correlates

Table 16 presents the intercorrelations for participation in the nine behaviors across 411 subjects. A positive correlation among two activities indicates that adolescents who participated in one behavior also tended to participate in the other. All the correlations among the six health-risk behaviors were positive. This finding strongly suggests a syndrome of problem behavior. For example, adolescents who participated in drinking beer during the six months preceding the survey were also significantly more likely to have had sex during that time period ($r = .53$).

Table 16

Intercorrelations Among Nine Behaviors

	1	2	3	4	5	6	7	8	9
1. Beer	1.000								
2. Liquor	0.769****	1.000							
3. Cigarettes	0.347****	0.348****	1.000						
4. Marijuana	0.387****	0.442****	0.443****	1.000					
5. Cocaine	0.146**	0.184***	0.239****	0.208****	1.000				
6. Sex	0.528****	0.504****	0.352****	0.369****	0.125	1.000			
7. Condom ^a	-0.180**	-0.241***	-0.054	-0.127	-0.008	-0.494****	1.000		
8. Exercise	-0.019	-0.018	-0.090	-0.015	0.011	-0.043	0.181**	1.000	
9. Seatbelt	-0.162***	-0.204****	-0.024	-0.203****	-0.017	-0.189****	0.170*	0.138**	1.000

^aSubset includes only those who had sexual intercourse during the six months prior to the survey (n=205).

*p < .05. **p < .01. ***p < .001. ****p < .0001.

Similarly, adolescents who participated in drinking liquor were more likely to have had sex ($\underline{r} = .53$). The strongest correlation was found for drinking beer and drinking liquor ($\underline{r} = .77$). Other significant correlations were found for smoking marijuana and drinking liquor ($\underline{r} = .44$) as well as for smoking marijuana and smoking cigarettes ($\underline{r} = .44$). The content analysis also pointed to a syndrome of problem behavior. For example, several respondents associated drinking beer with cigarette use and drug use.

Strong intercorrelations were also found for the image ratings associated with the six health-risk behaviors. For example, adolescents who rated the images they gave in response to one health-risk behavior as positive were also significantly more likely to rate the images they gave in response to other health-risk behaviors as more positive (Table 17).

The correlation matrix also indicates positive correlations among the three health-protective behaviors (Table 16). Health-risk and health-protective behaviors reflected a slightly negative correlation. The strongest negative correlation was found for using a condom and having sex ($\underline{r} = -.49$), indicating that a fair number of adolescents who had sexual intercourse during the six months preceding the survey did not use a condom. In fact, a subsequent frequency analysis showed that only 39% ($\underline{n}=80$) of adolescents who had intercourse during the six months preceding the survey used a condom.

Table 17

Intercorrelations Among Ratings Associated with Nine Behaviors

	1	2	3	4	5	6	7	8	9
1. Beer	1.000								
2. Liquor	0.655****	1.000							
3. Cigarettes	0.322****	0.375****	1.000						
4. Marijuana	0.452****	0.444****	0.575****	1.000					
5. Cocaine	0.221****	0.213****	0.487****	0.563****	1.000				
6. Sex	0.403****	0.347****	0.201****	0.283****	0.140**	1.000			
7. Condom ^a	-0.007	-0.093	-0.010	-0.146*	-0.122	-0.052	1.000		
8. Exercise	0.012	0.008	-0.073	-0.097	0.070	0.180***	0.122	1.000	
9. Seatbelt	-0.028	-0.033	0.133	0.088	0.136	0.119*	-0.003	0.270****	1.000

^aSubset includes only those who had sexual intercourse during the six months prior to the survey ($n=205$).

* $p < .05$. ** $p < .01$. *** $p < .001$. **** $p < .0001$.

In general, the overall correlation pattern did not significantly differ by gender or by age. That is, all groups of adolescents showed evidence of a problem behavior syndrome. However, in spite of this overall similarity, specific behavior correlations did show some differences by gender or by age. Tables 18 and 19 provide the intercorrelations among the nine stimulus behaviors by gender. Findings show that for adolescent girls, using cocaine was significantly correlated with drinking beer ($\underline{r} = .18$), drinking liquor ($r = .26$), smoking cigarettes ($\underline{r} = .25$) and smoking marijuana ($\underline{r} = .29$). In contrast, for adolescent boys, using cocaine was only significantly correlated with smoking cigarettes ($\underline{r} = .19$). For adolescent boys as well as for adolescent girls, having sex was significantly negatively correlated with using a condom. However, for boys this behavior was also significantly negatively correlated with drinking beer ($\underline{r} = -.32$) and with drinking liquor ($\underline{r} = -.34$). Finally, using a seatbelt was significantly negatively correlated with drinking beer for adolescent boys ($\underline{r} = -.19$), but not for adolescent girls.

Tables 20 and 21 provide the intercorrelations among the nine stimulus behaviors by age. Cocaine use was significantly correlated with drinking beer ($\underline{r} = .16$), smoking marijuana ($\underline{r} = .30$), and having sex ($\underline{r} = .25$) for younger adolescents, but not for older adolescents (Table 16). Further, seatbelt usage was significantly negatively correlated with drinking beer ($\underline{r} = -.23$) and liquor ($\underline{r} = -.30$)

Table 18

Intercorrelations Among Nine Behaviors for Females

	1	2	3	4	5	6	7	8	9
1. Beer	1.000								
2. Liquor	0.732****	1.000							
3. Cigarettes	0.436****	0.449****	1.000						
4. Marijuana	0.425****	0.481****	0.460****	1.000					
5. Cocaine	0.179**	0.260****	0.249***	0.294****	1.000				
6. Sex	0.473****	0.472****	0.434****	0.402****	0.169*	1.000			
7. Condom ^a	-0.075	-0.179	-0.039	-0.078	-0.010	-0.431****	1.000		
8. Exercise	-0.032	-0.019	-0.076	-0.049	-0.032	-0.074	0.205	1.000	
9. Seatbelt	-0.114	-0.152*	-0.074	-0.184**	-0.110	-0.163*	0.153	0.197**	1.000

Note. n=209.

^aSubset includes only those who had sexual intercourse during the six months prior to the survey.

*p < .05. **p < .01. ***p < .001. ****p < .0001.

Table 19

Intercorrelations Among Nine Behaviors for Males

	1	2	3	4	5	6	7	8	9
1. Beer	1.000								
2. Liquor	0.798****	1.000							
3. Cigarettes	0.298****	0.284****	1.000						
4. Marijuana	0.357****	0.406****	0.392****	1.000					
5. Cocaine	0.134	0.106	0.195**	0.050	1.000				
6. Sex	0.588****	0.537****	0.253***	0.323****	0.039	1.000			
7. Condom ^a	-0.322**	-0.337***	0.006	-0.192	0.099	-0.502****	1.000		
8. Exercise	0.073	-0.006	-0.126	0.012	0.084	-0.019	0.145	1.000	
9. Seatbelt	-0.192**	-0.234***	-0.027	-0.239***	0.059	-0.259***	0.294**	0.111	1.000

Note. n=195.

^aSubset includes only those who had sexual intercourse during the six months prior to the survey.

*p < .05. **p < .01. ***p < .001. ****p < .0001.

Table 20

Intercorrelations Among Nine Behaviors for Age Group 14 to 16 Years

	1	2	3	4	5	6	7	8	9
1. Beer	1.000								
2. Liquor	0.815****	1.000							
3. Cigarettes	0.437****	0.431****	1.000						
4. Marijuana	0.451****	0.469****	0.515****	1.000					
5. Cocaine	0.161*	0.170**	0.256****	0.309****	1.000				
6. Sex	0.532****	0.561****	0.444****	0.522****	0.248****	1.000			
7. Condom ^a	-0.235*	-0.298**	-0.152	-0.220*	-0.025	-0.477****	1.000		
8. Exercise	0.023	-0.030	-0.058	0.000	-0.005	-0.079	0.288**	1.000	
9. Seatbelt	-0.010	-0.126	-0.089	-0.168**	-0.049	-0.201**	0.131	0.247****	1.000

Note. n=245.

^aSubset includes only those who had sexual intercourse during the six months prior to the survey.

*p < .05. **p < .01. ***p < .001. ****p < .0001.

Table 21

Intercorrelations Among Nine Behaviors for Age Group 17 to 20 Years

	1	2	3	4	5	6	7	8	9
1. Beer	1.000								
2. Liquor	0.702****	1.000							
3. Cigarettes	0.265***	0.277***	1.000						
4. Marijuana	0.314****	0.416****	0.304****	1.000					
5. Cocaine	0.135	0.207**	0.222**	0.063	1.000				
6. Sex	0.435****	0.390****	0.298****	0.188*	-0.018	1.000			
7. Condom ^a	-0.099	-0.208*	-0.036	-0.123	-0.017	-0.486****	1.000		
8. Exercise	0.042	0.013	-0.132	-0.038	0.032	0.038	0.091	1.000	
9. Seatbelt	-0.227**	-0.305****	0.098	-0.249**	0.020	-0.163*	0.209*	-0.002	1.000

Note. n=160.

^aSubset includes only those who had sexual intercourse during the six months prior to the survey.

*p < .05. **p < .01. ***p < .001. ****p < .0001.

for older adolescents, but not for younger adolescents. Finally, condom use was significantly negatively correlated with drinking beer ($r = .23$) and smoking marijuana ($r = -.22$) for younger adolescents, but not for older adolescents.

In conclusion, a syndrome of health-risk behaviors in which participation in one health-risk behavior was significantly associated with participation in another was apparent. Furthermore, the three health-protective behaviors also showed evidence of a behavioral syndrome. For example, participants who used a condom also tended to wear a seatbelt ($r = .17$). Evidence for behavioral syndromes was found for adolescent girls and boys as well as for younger and older adolescents.

DISCUSSION

The present study used a free association technique to explore the meaning that adolescents give to six health-risk and three health-protective behaviors. The fact that the results are generally orderly and meaningful leads to the conclusion that the free association methodology represents a useful technique to investigate how adolescents think about health-risk and health-protective behavior.

Replications of Previous Findings

Outcome Expectancies

Previous research on outcome expectancies suggested that rather than being arbitrary, adolescent health-risk behaviors are linked to the anticipation of specific outcomes (Brown et al., 1980; Brown et al., 1987). Findings from the current study are consistent with this suggestion. Commonly cited outcome associations that emerged from the current study were: social facilitation, having fun, physiological arousal, relaxation and tension reduction, sexual facilitation, and positive affective change.

Existing research on outcome expectancies and risk perceptions indicates that those who participate in health-

risk behavior are more likely to anticipate positive outcomes and less likely to associate harmful effects from the behavior than those who do not participate (Brown et al., 1987; Benthin et al., 1993). Consistent with previous findings, the current study found participants to be significantly more likely than nonparticipants to expect positive outcomes from the behaviors. Similarly, participants were significantly less likely to associate negative outcomes with the behaviors.

Syndrome of Problem Behavior

Previous research on adolescent health-risk behavior indicates a syndrome of problem behavior (Benthin et al., 1993). Consistent with previous research, quantitative and qualitative results from the current study point to a problem-behavior syndrome. The quantitative analysis demonstrated that adolescents who engaged in one form of risk taking were also found to engage in another. Similarly, content analysis of the images drew attention to a problem-behavior syndrome. For example, the stimulus behavior "drinking beer" was associated with other health-risk behaviors such as smoking cigarettes and using drugs.

Differences from Previous Findings

Gender and Participation in Health-Risk Behavior

A number of scholars including Slovic (1966), Hudgens and Fatkin (1985), Levin et al. (1988), and Saucier and Ambert (1983) have discussed the importance of understanding the concept of risk in regard to gender. Related specifically to health-risk behavior, previous research indicated that adolescent girls tend to evaluate a variety of behaviors as more risky than do boys. The present study did not show that adolescent girls were significantly more likely than male adolescents to associate the six health-risk behaviors with negative outcomes. However, adolescent girls were found to be significantly more likely to associate positive outcomes with health-protective behavior, including seatbelt and condom use.

New Findings

Usefulness of the Summation Index

A major contribution of this study is that it demonstrates the usefulness of the summation index for predicting participation in health-risk and health-protective behaviors. The finding that for seven of the nine behaviors, the summation index served as the strongest predictor for specific behavior participation, strongly suggests that af-

fect serves as a powerful predictor of behavior preferences.

Comparison of Health-Risk Behaviors

Previous studies of adolescent health-risk behavior suggest that despite their diverse nature, different health-risk behaviors may carry similar meanings for the adolescent (Jessor, 1984; Mechanic, 1979). The present study was unique in that it focused on several health-risk behaviors and thus allowed a comparison of meaning across these behaviors. Findings showed considerable overlap among anticipated outcomes for the six health-risk behaviors. This supports the idea that different health-risk behaviors may indeed serve similar psychological functions and thus carry similar meanings for the adolescent.

Meaning of Health-Protective Behaviors

The present study was also able to provide insight into the meanings adolescents associate with health-protective behaviors. Costa et al. (1989) suggested that health-protective behaviors during adolescence may be associated with outcomes aside from physical well-being. Findings from the present study support this suggestion. For example, exercising was associated with improved physical health as well as with fun, social facilitation, and improved appearance. In addition, the current study was able to identify some of the negative meanings adolescents asso-

ciate with health-protective behavior. For example, in addition to association with positive outcomes, condom use was associated with negative outcomes such as inconvenience, reduced pleasure, and embarrassment. Similarly, seatbelt use was associated with negative outcomes such as social stigma and physical danger (e.g., being trapped in case of an accident).

Perceived Risk

Contrary to popular belief, the adolescents in this study, including those who frequently participated in health-risk behaviors, were well aware of the many dangers involved in health-risk behaviors. In addition to the dangers, however, many adolescents also perceived positive aspects of health-risk behaviors.

Media Influence

Another contribution of this study has been its ability to demonstrate the role of the media in adolescent thinking about adolescent health behaviors. For example, smoking cigarettes was associated with images that made direct reference to movies, commercials, and media characters such as "Joe Camel" or the "Marlboro Man." Media-related imagery was given in association with both health-risk behaviors and health-protective behaviors. For example, in association with exercise, four specific references were made to "Jane Fonda," and in association with seatbelt

use, seven specific references were made to "buckle up" ads. Only one direct media-related association was given for condom use.

Affective Syndrome

The current study demonstrated that strong intercorrelations existed not only for participation in the six health-risk behaviors, but also for the affective ratings associated with the images related to these behaviors. That is, adolescents who rated images associated with one health-risk behavior positively, also rated images associated with other health-risk behaviors positively.

Limitations

One limitation of this study is that subject imagery may have been influenced by tasks in the questionnaire that preceded the imagery task. The imagery task was preceded by a task that asked subjects to indicate their perceptions of risk involved in the nine stimulus behaviors. This may have influenced subjects' subsequent imagery associated with the behaviors. In other words, the risk perception task may have influenced subjects to approach the imagery task from a "risk frame of mind," thus inflating the number of images related to negative outcomes. However, if this influence did indeed occur, it most likely would have also led to fewer positive outcomes. Consequently, the finding

that subjects nevertheless associated so many positive outcomes with the behaviors is especially noteworthy.

Another potential problem resides in the free-association technique, in that subjects may have free associated to their own images as opposed to the original stimulus behaviors. For example, a subject's first image for a given stimulus behavior may have been "dangerous." Each subsequent image given in response to the behavior may have been associated with this first image. This problem was addressed by instructions for the imagery task that advised subjects to return to the original stimulus behavior for each new image.

Another limitation of this study is that each subject was asked to provide up to five images in association with a given stimulus behavior, and thus the independence assumption needed for most statistical tests was not met. As a result, analysis of the findings was largely restricted to a descriptive basis.

Conclusions, Implications, and Suggestions for Future Research

The present study demonstrates that actual participation in health-risk and health-protective behaviors is related to very distinct cognitive and affective factors. From a cognitive perspective, people who engage in given health-risk or health-protective behaviors tend to think

more positively about the behavior. That is, participants are more likely than nonparticipants to associate positive outcomes and less likely to associate negative outcomes with the behavior. From an affective perspective, as indicated by the ratings given to the images associated with the behavior, the images of those who participated carried greater positive affect.

The finding that health-risk behaviors were associated with specific benefits for adolescents who engaged in the behaviors and that participants seemed to be well aware of the dangers associated with the behaviors requires special attention. Specifically, this finding suggests that problem-focused prevention and intervention programs that tend to rely on "scare-techniques" to deter adolescents from engaging in health-risk behaviors should be replaced with programs that acknowledge that adolescent behaviors fulfill specific functions for younger persons and should thus focus on offering alternative, less hazardous ways to meet adolescent needs. Furthermore, the finding that the adolescents who participated in the present study associated health-protective behaviors not only with positive outcomes, but also with negative outcomes, is important. This finding suggests that educational messages should include suggestions for adolescents on how to reduce or avoid potentially negative outcomes associated with health-protective behaviors.

It is also noteworthy that the results from this study pointed to a problem-behavior syndrome. In other words, adolescents who engage in one form of risk taking tend to also engage in other forms of risk taking. The finding that adolescents who engaged in one form of health-protective behavior were also somewhat more likely to engage in other health-protective behaviors and somewhat less likely to engage in health-risk behaviors needs to be pursued. Future research should explore further the relation between health-risk and health-protective behaviors.

This relationship seems especially interesting in regard to gender. For example, findings from the present study were consistent with previous research findings suggesting that females were more likely than males to evaluate health-protective behaviors (e.g., seatbelt usage) in positive terms. However, female participants in the present study were not significantly more likely to associate negative outcomes with health-risk behaviors. One explanation may be that females are more cautious when engaging in health-risk behaviors and thus do not perceive negative outcomes associated with the behaviors.

A number of other directions for future research are also indicated by the findings from the present study. For example, it would be of interest to investigate whether young people differ from adults with respect to the imagery associated with health-risk and health-protective behaviors. Adolescents may contemplate some valued outcomes for

health-risk or health-protective behaviors that adults fail to consider, or vice versa (Furby & Beyth-Marom, 1990). In addition, adolescents may value some of the possible outcomes differently than do adults. Finally, adolescents and adults might differ in the magnitude of their evaluations, either in how negatively they perceive a given negative outcome or in how positively they perceive a given positive outcome.

Another direction for future research in this area lies in longitudinal research. Application of cognitive dissonance theory (Festinger, 1957) would result in the prediction that adolescents who engage in a given health-risk or health-protective behavior would adjust their imagery to be consistent with their actions. Longitudinal studies should be conducted to assess the development of imagery and to determine if the imagery associated with a given health-risk or health-protective behavior occurs prior to participation in the behavior, thus enabling its use to predict the onset of participation in the behavior.

Yet another hypothesis in need of testing is whether repeated exposure to a stimulus is a sufficient condition to enhance the favorable attitudes of observers toward that stimulus (Zajonc, 1968). In other words, is participation in a given health-risk or health-protective behavior a sufficient condition for the enhancement of favorable attitudes among participants toward that behavior? For example, Becker (1963) proposed that with increased experience,

marijuana users develop a greater appreciation of the drug's effects. An alternative hypothesis suggests that participation enhances the perception of both positive outcomes and negative outcomes.

Finally, previous research and consideration of theories of adolescent health behaviors have paid insufficient attention to the influence of the media upon adolescent health-risk behaviors. Qualitative findings from the present study indicate that adolescent thinking about health-risk as well as health-protective behaviors is influenced by images presented in the media. Future empirical efforts should be undertaken to examine the links among media messages, adolescent thinking patterns, and adolescent health behaviors. In this manner, social science research carries the potential to serve as an important contributor to an increased sense of social responsibility among media specialists.

BIBLIOGRAPHY

- Bauman, K. E. (1980). Predicting adolescent drug use: Utility structure and marijuana. New York: Praeger.
- Bauman, K. E., & Bryan, E. S. (1983). Adolescent beer drinking: Subjective expected utility and gender differences. Youth and Society, 15, 157-170.
- Bauman, K. E., & Chenoweth, R. L. (1984). The relationship between the consequences adolescents expect from smoking and their behavior: A factor analysis with panel data. Journal of Applied Social Psychology, 14, 28-41.
- Bauman, K. E., & Udry, J. R. (1981). Subjective expected utility and adolescent sexual behavior. Adolescence, 16, 527-535.
- Baumrind, D. (1987). A developmental perspective on adolescent risk taking in contemporary America. In L. Irwin (Ed.), Social behavior and health (pp. 93-125). San Francisco: Jossey-Bass.
- Becker, H. S. (1963). Outsiders: Studies in the sociology of deviance. New York: Macmillan.
- Benthin, A., Slovic, P., & Severson, H. (1993). A psychometric study of adolescent risk perception. Journal of Adolescence, 16, 00-00.
- Brooks-Gunn, J., & Furstenberg, F. (1989). Adolescent sexual behavior. American Psychologist, 44, 249-257.
- Brown, B. (1990). Peer groups and peer culture. In S. S. Feldman & G. R. Elliot (Eds.), At the threshold: The developing adolescent (pp. 171-196). Cambridge, MA: Harvard University.
- Brown, S., Christiansen, B., & Goldman, M. (1987). The alcohol expectancy questionnaire: An instrument for the assessment of adolescent and adult alcohol expectancies. Journal of Studies on Alcohol, 48, 483-491.

- Brown, S., Goldman, N., Inn, A., & Anderson, L. (1980). Expectations of reinforcement from alcohol: Their domain and relation to drinking patterns. Journal of Counseling and Clinical Psychology, 48, 419-426.
- Butler, M., Gunderson, E., & Bruni, J. (1981). Motivational determinants of illicit drug use: An assessment of underlying dimensions and their relationships to behavior. International Journal of the Addictions, 16, 243-252.
- Centers for Disease Control. (1988). Morbidity and Mortality Weekly Report, 37, 709-711.
- Centers for Disease Control. (1990). HIV/AIDS surveillance report, 1-18.
- Chassin, L., Presson, C. C., Sherman, S. J., & Edwards, D. A. (1990). The natural history of cigarette smoking: predicting young-adult smoking outcomes from adolescent smoking patterns. Health Psychology, 9, 701-716.
- Chassin, L., Presson, C. C., Sherman, S. J. (1989). "Constructive" vs. "destructive" deviance in adolescent health-related behaviors. Journal of Youth and Adolescence, 18, 245-262.
- Chilman, C. (1983). Adolescent sexuality in a changing American society: Social and psychological perspectives for the human services professions. New York: J. Wiley & Sons.
- Christiansen, B., & Goldman, M. (1983). Alcohol-related expectancies versus demographic background variables in the prediction of adolescent drinking. Journal of Consulting and Clinical Psychology, 51, 249-257.
- Christiansen, B., Goldman, M., & Brown, S. (1985). The differential development of adolescent alcohol expectancies may predict adult alcoholism. Journal of Addictive Behaviors, 10, 299-306.
- Christiansen, B., Goldman, M., & Inn, A. (1982). The development of alcohol-related expectancies in adolescents: Separating pharmacological from social-learning influences. Journal of Consulting and Clinical Psychology, 50, 336-344.
- Christiansen, B., Smith, G., Roehling, P., & Goldman, M. (1989). Using alcohol expectancies to predict adolescent drinking behavior after one year. Journal of Consulting and Clinical Psychology, 57, 93-99.

- Costa, F. M., Jessor, R., & Donovan, J. E. (1989). Value on health and adolescent conventionality: A construct validation of a new measure in problem-behavior theory. Journal of Applied Social Psychology, 19, 841-861.
- De Vellis, R. F. (1991). Scale development: Theory and applications. Newberg Park, CA: Sage.
- Donovan, J., & Jessor, R. (1985). Structure of problem behavior in adolescence and young adulthood. Journal of Consulting and Clinical Psychology, 53, 890-904.
- Donovan, J., Jessor, R., & Costa, F. (1988). Syndrome of problem behavior in adolescence: A replication. Journal of Consulting and Clinical Psychology, 56, 762-765.
- Elkind, D. (1967). Egocentrism in adolescence. Child Development, 38, 1025-1034.
- Festinger, L. (1957). A theory of cognitive dissonance. Evanston, IL: Row-Peterson.
- Finn, P., & Bragg, B. (1986). Perception of risk by young and older drivers. Accident Analysis and Prevention, 18, 289-298.
- Fischhoff, B., Slovic, P., Lichtenstein, S., Read, S., & Combs, B. (1978). How safe is safe enough? A psychometric study of attitudes toward technological risks and benefits. Policy Sciences, 9, 127-152.
- Freud, S. (1924). Collected papers. London: Hogarth.
- Furby, L., & Beyth-Marom, R. (1990). Risk taking in adolescence: A decision-making perspective. Washington, D.C.: Carnegie Council on Adolescent Development.
- Galton, F. (1880). Psychometric experiments. Brain, 2, 149-162.
- Gilbert, M. A., Bauman, K. E., & Udry, J. R. (1986). A panel study of subjective expected utility for adolescent sexual behavior. Journal of Applied Social Psychology, 16, 745-756.
- Gilligan, C. (1982). In a different voice: Psychological theory and women's development. Cambridge, MA: Harvard University Press.

- Gilligan, C., Lyons, N., & Hammer, T. (1990). Making connections: The relational world of adolescent girls at Emma Willard School. Cambridge, MA: Harvard University Press.
- Goldman, M., Brown, S., Christiansen, B., & Smith, G. (in press). Alcohol etiology and memory: Broadening the scope of alcohol expectancy research. Psychological Bulletin.
- Green, D. (1980). Teenage smoking behavior. In F. R. Scarpatti & S. K. Datesman (Eds.), Drugs and the youth culture (pp. 147-174). Beverly Hills, CA: Sage.
- Hill, J., & Lynch, M. (1983). The intensification of gender-related role expectations during early adolescence. In J. Brooks-Gunn & A. Peterson (Eds.), Girls at puberty: Biological and psychosocial perspectives (pp. 201-228). New York: Plenum Press.
- Hudgens, G., & Fatkin, L. (1985). Sex differences in risk taking: Repeated sessions on a computer-simulated task. The Journal of Psychology, 119, 197-206.
- Jessor, R. (1984). Adolescent development and behavioral health. In J. D. Matarazzo, S. M. Weiss, J. A. Herd, & N. E. Miller (Eds.), Behavioral health: A handbook of health enhancement and disease prevention (pp. 69-90). New York: Wiley.
- Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. British Journal of Addiction, 82, 331-342.
- Jessor, R., & Jessor, S. L. (1977). Problem behavior and psycho-social development: A longitudinal study of youth. New York: Academic Press.
- Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (1987). National trends in drug use and related factors among American high school students and young adults: 1975-1986. Rockville, MD: U.S. Department of Health and Human Services, National Institute on Drug Abuse.
- Kandel, D., Kessler, R., & Margulies, R. (1978). Antecedents of adolescent initiation into stages of drug use: A developmental analysis. In Kandel, D. (Ed.), Longitudinal research on drug use: Empirical findings and methodological issues (pp. 73-99). Washington, DC: Hemisphere.

- Levin, I., Snyder, M., & Chapman, D. (1988). The interaction of experiential and situational factors and gender in a simulated risky decision-making task. The Journal of Psychology, 122, 173-181.
- McCarty, D., & Kaye, M. (1984). Reasons for drinking: Motivational patterns and alcohol use among college students. Addictive Behaviors, 9, 185-188.
- McLaughlin, R., Baer, P., Pokorny, A., Burnside, M., & Fairlie, A. (1985). Age-graded prevalence of alcohol use during adolescence (ERIC Document Reproduction Service No. ED 257 020).
- Mechanic, D. (1979). The stability of health and illness behavior: Results from a 16-year follow-up. American Journal of Public Health, 69, 1142-1145.
- Miller, P., Smith, G., Goldman, S. (in press). Emergence of alcohol expectancies in childhood: A possible critical period. Journal of Studies on Alcohol.
- Millstein, S. (1989). Adolescent health. American Psychologist, 44, 837-842.
- Millstein, S., & Litt, J. (1990). Adolescent health. In S. Feldman & G. Elliott (Eds.), At the threshold: The developing adolescent (pp. 431-456). Cambridge, MA: Harvard University Press.
- Newcomb, M., Chou, C., Bentler, P., & Huba, G. (1988). Cognitive motivations for drug use among adolescents: Longitudinal tests of gender differences and predictors of change in drug use. Journal of Counseling Psychology, 35, 426-438.
- Novello, A. (1988). Final report of secretary's working group on pediatric HIV infection and disease. Washington, DC: U.S. Department of Health and Human Services.
- Osgood, C. (1952). The nature and measurement of meaning. Psychological Bulletin, 49, 197-237.
- Quadrel, M., Fischhoff, B., & Davis, W. (1993). Adolescent (in)vulnerability. American Psychologist, 48, 102-116.
- Rachel, J., Williams, J., & Brehm, M. (1975). A national study of adolescent drinking behavior attitudes and correlates (NTIS No. PB-246-002/AS). Rockville, MD: National Clearinghouse for Alcohol Information.

- Rohsenow, D. (1983). Drinking habits and expectancies about alcohols' effect for self versus others. Journal of Consulting and Clinical Psychology, 57, 752-756.
- Saucier, J. F., & Ambert, A. M. (1983). Parental marital status and adolescents' health-risk behavior. Adolescence, 18, 403-411.
- Schafer, J., & Brown, S. (1991). Marijuana and cocaine effect expectancies and drug use patterns. Journal of Consulting and Clinical Psychology, 59, 558-565.
- Shedler, J., & Block, J. (1990). Adolescent drug use and psychological health: A longitudinal inquiry. American Psychologist, 45, 612-630.
- Slovic, P. (1966). Risk taking in children: Age and sex differences. Child Development, 37, 169-176.
- Slovic, P. (1987). Perception of risk. Science, 236, 280-285.
- Slovic, P., Fischhoff, B., & Lichtenstein, S. (1979). Risks: Facts and fears. Environment, 21, 15-39.
- Slovic, P., Flynn, J., & Layman, M. (1991a). Perceived risk, trust, and the politics of nuclear waste. Science, 254, 1603-1607.
- Slovic, P., Layman, M., & Flynn, J. (1990). What comes to mind when you hear the words "nuclear waste repository"? A study of 10,000 images (Report No. NWPO/SE/029190). Carson City, NV: Agency for Nuclear Projects, Yucco Mountain Socioeconomic Project.
- Slovic, P., Layman, M., & Flynn, J. (1991b). Risk perception, trust, and nuclear waste: Lessons from Yucca mountain. Environment, 33, 6-11.
- Slovic, P., Layman, M., Kraus, N., Flynn, J., Chalmers, J., & Gesell, G. (1991c). Perceived risk, stigma, and potential economic impacts of a high-level nuclear waste repository in Nevada. Risk Analysis, 11.
- Szalay, L., & Deese, J. (1978). Subjective meaning and culture: An assessment through word associations. Hillsdale, NJ: Erlbaum.
- Urberg, K., & Robbins, R. (1981). Adolescents' perceptions of the costs and benefits associated with cigarette smoking: Sex differences and peer influence. Journal of Youth and Adolescence, 10, 353-361.

- Violato, C., & Holden, W. B. (1988). A confirmatory factor analysis of a four-factor model of adolescent concerns. Journal of Youth and Adolescence, 17, 101-113.
- Weinstein, E., & Rosen, E. (1991). The development of adolescent sexual intimacy: Implications for counseling. Adolescence, 26, 331-339.
- Wundt, W. (1883). Ueber psychologische methoden. Philosophische Studien, 1, 1-38.
- Youngstrom, N. (1991). Warning: Teens at risk for AIDS. The APA Monitor, 22(10), 38-39.
- Zajonc, R. (1968). Attitudinal effects of mere exposure. Journal of Personality and Social Psychology Monograph Supplement, 9(2), 1-27.
- Zuckerman, M. (1979). Sensation seeking: Beyond the optimal level of arousal. Hillsdale, NJ: Erlbaum.
- Zuckerman, M. (1983a). Sensation seeking and sports. Journal of Personality and Individual Differences, 4, 285-293.
- Zuckerman, M. (1983b). Sensation seeking: The initial motive for drug use. In E. Gottheil, K. Druley, T. Sholada, & H. Waxman (Eds.), Etiological aspects of alcohol and drug abuse (pp. 202-220). Springfield, IL: Thomas.
- Zuckerman, M., & Neeb, M. (1980). Demographic influences in sensation seeking and expressions of sensation seeking in religion, smoking, and driving habits. Journal of Personality and Individual Differences, 1, 197-206.

APPENDICES

APPENDIX A

ADOLESCENT RISK AND IMAGERY QUESTIONNAIRE

Age: _____ Sex: F M Questionnaire #: _____
Grade: _____ School: _____ Date: _____

**ADOLESCENT RISK AND IMAGERY
QUESTIONNAIRE**

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Suslaw Version - May 1992

Part I

PERSONAL INFORMATION

Please answer the following questions about yourself.

1. Are your parents divorced? Yes ☐ No ☐
2. Do you live with both parents? Yes ☐ No ☐
3. Do you live only with your mother? Yes ☐ No ☐
4. Do you live only with your father? Yes ☐ No ☐
5. Do you live with one of your parents and a stepparent? Yes ☐ No ☐
6. If you don't live with a parent or stepparent, who do you live with? Please specify: _____

7. What is your racial background?
 - _____ African-American, Black
 - _____ Native-American
 - _____ Asian
 - _____ Caucasian, White (not Hispanic)
 - _____ Hispanic
 - _____ Mexican-American
 - _____ Other: Please Specify _____

Part II

RISK PERCEPTIONS

We are interested in your perception of the risks or dangers involved in doing certain things. We are interested in your personal feelings about these activities.

You will be asked to rate each activity in terms of scales, each presented as a different question on each page. Read the questions and rate each type of activity using the scale provided. Indicate your rating by circling the number on the scale that most closely represents your beliefs about the nature of each activity. Clearly circle the corresponding number on each scale, as in this example:

EXAMPLE

If you did this activity, how willing would your best friend be to do it with you?

	Very willing						Not willing at all		
Ice skating	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
Shoplifting	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know

If you are unfamiliar with the activity or unsure of how to rate it, check the "don't know" box to the right of the scale, as show below.

Diving off a high dive board	1	2	3	4	5	6	7	<input checked="" type="checkbox"/>	don't know	
------------------------------------	---	---	---	---	---	---	---	-------------------------------------	------------	--

Be sure to rate all activities on one particular scale page before going on to the next page. You may go back and change your responses. Please do not put your name on this questionnaire. If you have any questions or are unsure about something, raise your hand and someone will help you. Thank you for your help.

GENERAL RULE: Please, respect the privacy of others and don't look at their questionnaire.

Ready? Please turn the page and begin.

SCALE 1

If you did this activity, how much do you believe that you would be personally at risk of getting hurt or getting sick?

	<u>I would not be at risk</u>							<u>I would be very much at risk</u>	
1. Drinking beer or wine	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
2. Drinking hard liquor (e.g.vodka, mixed drinks, etc.)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
3. Smoking cigarettes	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
4. Driving a car while under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
5. Drinking five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
6. Smoking marijuana	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
7. Riding in a car with a driver under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
8. Using cocaine and/or smoking "Crack"	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
9. Using chew or snuff	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
10. Using inhalants (glue, aerosol spray)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
11. Having sexual intercourse without using a condom	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
12. Taking meth-amphetamines ("meth", "uppers")	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know

SCALE 2

If someone your age (other than yourself) did this activity, how much do you believe that he/she would be at risk of getting hurt or getting sick?

	S/he would <u>not be</u> at risk							S/he would be <u>very much</u> at risk	
1. Drinking beer or wine	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
2. Drinking hard liquor (e.g.vodka, mixed drinks, etc.)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
3. Smoking cigarettes	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
4. Driving a car while under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
5. Drinking five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
6. Smoking marijuana	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
7. Riding in a car with a driver under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
8. Using cocaine and/or smoking "Crack"	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
9. Using chew or snuff	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
10. Using inhalants (glue, aerosol spray)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
11. Having sexual intercourse without using a condom	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
12. Taking meth- amphetamines ("meth", "uppers")	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know

SCALE 3

If you did this activity, to what extent would it provide you with pleasure or other benefits?

	Little or no benefits or pleasure							Great benefits or pleasure
1. Drinking beer or wine	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
2. Drinking hard liquor (e.g.vodka, mixed drinks etc.)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
3. Smoking cigarettes	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
4. Driving a car while under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
5. Drinking five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
6. Smoking marijuana	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
7. Riding in a car with a driver under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
8. Using cocaine and/or smoking "Crack"	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
9. Using chew or snuff	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
10. Using inhalants (glue, aerosol spray)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
11. Having sexual intercourse without using a condom	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
12. Taking meth- amphetamines ("meth", "uppers")	1	2	3	4	5	6	7	<input type="checkbox"/> don't know

SCALE 4

If someone your age did this activity, to what extent could he/she control the risks associated with it?

	Risks <u>cannot</u> be controlled							Risks can be <u>completely</u> controlled	
1. Drinking beer or wine	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
2. Drinking hard liquor (e.g.vodka, mixed drinks etc.)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
3. Smoking cigarettes	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
4. Driving a car while under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
5. Drinking five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
6. Smoking marijuana	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
7. Riding in a car with a driver under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
8. Using cocaine and/or smoking "Crack"	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
9. Using chew or snuff	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
10. Using inhalants (glue, aerosol spray)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
11. Having sexual intercourse without using a condom	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	
12. Taking meth- amphetamines ("meth", "uppers")	1	2	3	4	5	6	7	<input type="checkbox"/> don't know	

SCALE 5**How would your friends feel about you doing this activity?**

	Strongly opposed							Strongly in favor	
1. Drinking beer or wine	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
2. Drinking hard liquor (e.g. vodka, mixed drinks, etc)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
3. Smoking cigarettes	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
4. Driving a car while under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
5. Drinking five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
6. Smoking marijuana	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
7. Riding in a car with a driver under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
8. Using cocaine and/or smoking "Crack"	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
9. Using chew or snuff	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
10. Using inhalants (glue, aerosol spray)	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
11. Having sexual intercourse without using a condom	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know
12. Taking meth- amphetamines ("meth", "uppers")	1	2	3	4	5	6	7	<input type="checkbox"/>	don't know

SCALE 6

How upset would your parents be if they knew you did this activity?

	Parents would be very upset						Parents would not be upset	
1. Drinking beer or wine	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
2. Drinking hard liquor (e.g. vodka, mixed drinks etc.)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
3. Smoking cigarettes	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
4. Driving a car while under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
5. Drinking five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
6. Smoking marijuana	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
7. Riding in a car with a driver under the influence of alcohol or drugs	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
8. Using cocaine and/or smoking "Crack"	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
9. Using chew or snuff	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
10. Using inhalants (glue, aerosol spray)	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
11. Having sexual intercourse without using a condom	1	2	3	4	5	6	7	<input type="checkbox"/> don't know
12. Taking meth- amphetamines ("meth", "uppers")	1	2	3	4	5	6	7	<input type="checkbox"/> don't know

SCALE 7

- I. For each of the activities listed below, please indicated how many times you have done this activity during the PAST SIX MONTHS.

	Never	Occasionally	Frequently
1. Drunk beer or wine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Drunk hard liquor (e.g. vodka, mixed drinks, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Smoked cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Driven a car while under the influence of alcohol or drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Drunk five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Smoked marijuana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Rode in a car with a driver under the influence of alcohol or drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Used cocaine and/or smoking "Crack"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Used chew or snuff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Used inhalants (glue, aerosol spray)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Had sexual intercourse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Had sexual intercourse without using a condom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Took methamphetamines ("meth", "uppers")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Used a seat belt while riding in a car (as driver or passenger)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Exercised 20 minutes or more at least 3 times a week (outside of regular gym class)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

SCALE 7 (Continued)

II. For each of the activities listed below, please indicated how many times you have done this activity during the PAST WEEK.

	Never	Occasionally	Frequently
1. Drunk beer or wine	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Drunk hard liquor (e.g. vodka, mixed drinks, etc.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Smoked cigarettes	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Driven a car while under the influence of alcohol or drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Drunk five or more alcoholic beverages on a single occasion (1 beverage = 12 oz. beer, 4 oz. wine or 1 oz. hard liquor)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Smoked marijuana	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Rode in a car with a driver under the influence of alcohol or drugs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Used cocaine and/or smoking "Crack"	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Used chew or snuff	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Used inhalants (glue, aerosol spray)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Had sexual intercourse	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Had sexual intercourse without using a condom	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13. Took methamphetamines ("meth", "uppers")	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14. Used a seat belt while riding in a car (as driver or passenger)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15. Exercised 20 minutes or more at least 3 times a week (outside regular gym class)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Part III

ADOLESCENT ALCOHOL EXPECTANCY SCALE (AAES)

Please read the following statements about the effects of alcohol. If you think the statement is true or mostly true, then mark "true." If you think that the statement is false, or mostly false, or rarely happens to most people, then mark "false." When the statements refer to "drinking alcohol," you may think in terms of any alcoholic beverage, such as beer, wine, whiskey, liquor, rum, scotch, vodka, gin, or various alcoholic mixed drinks. Whether or not you have had actual drinking experience yourself, you are to answer in terms of how you think alcohol affects the typical or average drinker. It is important that you respond to every statement. There are no right or wrong answers to the following statements.

	True	False
1. People become harder to get along with after they have a few drinks of alcohol.	_____	_____
2. Drinking alcohol creates problems.	_____	_____
3. Drinking alcohol makes a bad impression on others.	_____	_____
4. People drive better after a few drinks of alcohol.	_____	_____
5. Teenagers drink alcohol in order to get attention.	_____	_____
6. Parties are <u>not</u> as much fun if people are drinking alcohol.	_____	_____
7. People feel more caring and giving after a few drinks of alcohol.	_____	_____
8. It is easier to play sports after a few drinks of alcohol.	_____	_____
9. A person can do things better after a few drinks of alcohol.	_____	_____
10. Drinking alcohol makes people more friendly.	_____	_____
11. Drinking alcohol is O.K. because it allows people to join in with others who are having fun.	_____	_____
12. When talking with people, words come to mind easier after a few drinks of alcohol.	_____	_____
13. Drinking alcohol makes people feel more alert.	_____	_____

- | | | |
|---|-------|-------|
| 14. Sweet alcoholic drinks taste good. | _____ | _____ |
| 15. Most alcoholic drinks taste good. | _____ | _____ |
| 16. Most people think better after a few drinks of alcohol. | _____ | _____ |
| 17. People understand things better when they are drinking alcohol. | _____ | _____ |
| 18. People act like better friends after a few drinks of alcohol. | _____ | _____ |
| 19. Most alcohol tastes terrible. | _____ | _____ |
| 20. Having a few drinks of alcohol is a nice way to enjoy holidays. | _____ | _____ |
| 21. It's fun to watch others act silly when they are drinking alcohol. | _____ | _____ |
| 22. Teenagers drink alcohol because they feel forced to do so by their peers. | _____ | _____ |
| 23. People can control their anger better when they are drinking alcohol. | _____ | _____ |
| 24. Alcoholic beverages make parties more fun. | _____ | _____ |
| 25. Alcohol makes people better lovers. | _____ | _____ |
| 26. People get in better moods after a few drinks of alcohol. | _____ | _____ |
| 27. Drinking alcohol helps teenagers to do their homework. | _____ | _____ |

PART IV

TEEN IMAGERY SURVEY

We all have images and ideas about things. Often when people hear about certain behaviors, they develop certain images in their mind about the meaning of these behaviors. We are interested in the meaning of certain behaviors to people your age.

In answering these questions, please make your judgments on the basis of what these behaviors mean to you. Work at a fairly high speed through this test. Do not worry or puzzle over your answers. It is your first impressions, your immediate "thoughts" that we want. On the other hand, please do not be careless, because we want your true impressions.

It is important that in answering these questions, you always focus on the specific behavior that we ask about. For example, if we ask you about thoughts that come to your mind when you think about "playing sports", it is important that you think about "playing sports" each time you write down a new thought about "playing sports".

**PLEASE DON'T SKIP BACKWARDS AND FORWARDS
THROUGH THIS SECTION OF THE QUESTIONNAIRE!**

To start out with, think for a moment about "drinking beer". We are interested in the first FIVE thoughts that come to mind when you think about "drinking beer".

Drinking beer

 Image #1

Drinking beer

 Image #2

Drinking beer

 Image #3

Drinking beer

 Image #4

Drinking beer

 Image #5

Now that you have thought about five images that come to your mind when you think about "drinking beer", I want to be sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "drinking beer" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now, think about "drinking liquor" (e.g. vodka, mixed drinks etc.). What are the first FIVE thoughts or images that come to mind when you think about "drinking liquor"?

Drinking liquor _____
Image #1

Drinking liquor _____
Image #2

Drinking liquor _____
Image #3

Drinking liquor _____
Image #4

Drinking liquor _____
Image #5

Now that you have thought about five images that come to your mind when you think about "drinking liquor", I want to make sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "drinking liquor" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now think about "smoking cigarettes". What are the first FIVE thoughts or images that come to mind when you think about "smoking cigarettes"?

Smoking cigarettes _____
Image #1

Smoking cigarettes _____
Image #2

Smoking cigarettes _____
Image #3

Smoking cigarettes _____
Image #4

Smoking cigarettes _____
Image #5

Now that you have thought about five images that come to your mind when you think about "smoking cigarettes", I want to be sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "smoking cigarettes" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now think about "exercising". What are the first FIVE thoughts or images that come to mind when you think about "exercising"?

Exercising

Image #1

Exercising

Image #2

Exercising

Image #3

Exercising

Image #4

Exercising

Image #5

Now that you have thought about five images that come to your mind when you think about "exercising", I want to be sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "exercising" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now think about "wearing a seat belt when you ride in a car". What are the first FIVE thoughts or images that come to mind when you think about "wearing a seat belt"?

Wearing a seat belt _____
Image #1

Wearing a seat belt _____
Image #2

Wearing a seat belt _____
Image #3

Wearing a seat belt _____
Image #4

Wearing a seat belt _____
Image #5

Now that you have thought about six images that come to your mind when you think about "wearing a seat belt", I want to make sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "wearing a seat belt" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now think about "smoking marijuana". What are the first FIVE thoughts or images that come to mind when you think about "smoking marijuana"?

Smoking marijuana _____
Image #1

Smoking marijuana _____
Image #2

Smoking marijuana _____
Image #3

Smoking marijuana _____
Image #4

Smoking marijuana _____
Image #5

Now that you have thought about five images that come to your mind when you think about "smoking marijuana", I want to make sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "smoking marijuana" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now think about "using cocaine". What are the first FIVE thoughts or images that come to your mind when you think about "using cocaine"?

Using cocaine _____
Image #1

Using cocaine _____
Image #2

Using cocaine _____
Image #3

Using cocaine _____
Image #4

Using cocaine _____
Image #5

Now that you have thought about five images that come to your mind when you think about "using cocaine", I want to be sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "using cocaine" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now think about "having sexual intercourse". Think about the first FIVE thoughts or images that come to mind when you think about "having sexual intercourse".

Having sexual intercourse _____
Image #1

Having sexual intercourse _____
Image #2

Having sexual intercourse _____
Image #3

Having sexual intercourse _____
Image #4

Having sexual intercourse _____
Image #5

Now that you have thought about five images that come to your mind when you think about "having sexual intercourse", I want to be sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "having sexual intercourse" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

Now think about "using a condom". What are the first FIVE thoughts or images that come to mind when you think about "using a condom".

Using a condom _____
Image #1

Using a condom _____
Image #2

Using a condom _____
Image #3

Using a condom _____
Image #4

Using a condom _____
Image #5

Now that you have thought about five images that come to your mind when you think about "using a condom", I want to be sure I understand if these images mean something positive or something negative to you.

So, please rate your images from above in the order in which you gave them on the scales below as either very negative (very bad), somewhat negative, neutral, somewhat positive, or very positive (very good). Circle one number for each image.

Be sure to only RATE YOUR IMAGES and not "using a condom" itself.

	Very Negative (very bad)	Somewhat Negative	Neutral	Somewhat Positive	V e r y Positive (very good)
Image #1	1	2	3	4	5
Image #2	1	2	3	4	5
Image #3	1	2	3	4	5
Image #4	1	2	3	4	5
Image #5	1	2	3	4	5

PART V**SEMANTIC DIFFERENTIAL**

On the following pages are a series of behaviors (e.g. smoking cigarettes, drinking alcohol). One behavior is written at the top of each page. Your task is to rate the behavior on a variety of different qualities or characteristics listed on the page.

Circle one number for each characteristic. There are no right or wrong answers. We are only interested in what these behaviors mean to you personally.

You will notice that you wrote about the same behaviors before on this survey. You do not need to remember what you wrote about these behaviors earlier in the survey. So, do not look back in your survey.

Please circle one number on each scale.

Drinking Beer

good 1	2	3	4	5	6	bad 7
beneficial 1	2	3	4	5	6	not beneficial 7
dangerous 1	2	3	4	5	6	safe 7
wrong 1	2	3	4	5	6	right 7
forbidden 1	2	3	4	5	6	allowed 7
planned 1	2	3	4	5	6	spontaneous 7
mature 1	2	3	4	5	6	immature 7
feminine 1	2	3	4	5	6	masculine 7
unpopular 1	2	3	4	5	6	popular 7
exciting 1	2	3	4	5	6	boring 7
attractive 1	2	3	4	5	6	unattractive 7
healthy 1	2	3	4	5	6	unhealthy 7
unaccepted 1	2	3	4	5	6	accepted 7
unavailable 1	2	3	4	5	6	available 7
social 1	2	3	4	5	6	antisocial 7
dislike 1	2	3	4	5	6	like 7

Please circle one number on each scale.

Drinking Liquor

dislike 1	2	3	4	5	6	like 7
social 1	2	3	4	5	6	antisocial 7
unavailable 1	2	3	4	5	6	available 7
unaccepted 1	2	3	4	5	6	accepted 7
healthy 1	2	3	4	5	6	unhealthy 7
attractive 1	2	3	4	5	6	unattractive 7
exciting 1	2	3	4	5	6	boring 7
unpopular 1	2	3	4	5	6	popular 7
feminine 1	2	3	4	5	6	masculine 7
mature 1	2	3	4	5	6	immature 7
planned 1	2	3	4	5	6	spontaneous 7
forbidden 1	2	3	4	5	6	allowed 7
wrong 1	2	3	4	5	6	right 7
dangerous 1	2	3	4	5	6	safe 7
beneficial 1	2	3	4	5	6	not beneficial 7
good 1	2	3	4	5	6	bad 7

Please circle one number on each scale.

Smoking Cigarettes

unpopular 1	2	3	4	5	6	popular 7
exciting 1	2	3	4	5	6	boring 7
attractive 1	2	3	4	5	6	unattractive 7
healthy 1	2	3	4	5	6	unhealthy 7
unaccepted 1	2	3	4	5	6	accepted 7
feminine 1	2	3	4	5	6	masculine 7
mature 1	2	3	4	5	6	immature 7
planned 1	2	3	4	5	6	spontaneous 7
forbidden 1	2	3	4	5	6	allowed 7
wrong 1	2	3	4	5	6	right 7
unavailable 1	2	3	4	5	6	available 7
social 1	2	3	4	5	6	antisocial 7
dislike 1	2	3	4	5	6	like 7
dangerous 1	2	3	4	5	6	safe 7
beneficial 1	2	3	4	5	6	not beneficial 7
good 1	2	3	4	5	6	bad 7

Please circle only one number on each scale.

Exercising

beneficial 1	2	3	4	5	6	not beneficial 7
dangerous 1	2	3	4	5	6	safe 7
wrong 1	2	3	4	5	6	right 7
good 1	2	3	4	5	6	bad 7
mature 1	2	3	4	5	6	immature 7
feminine 1	2	3	4	5	6	masculine 7
unpopular 1	2	3	4	5	6	popular 7
exciting 1	2	3	4	5	6	boring 7
planned 1	2	3	4	5	6	spontaneous 7
attractive 1	2	3	4	5	6	unattractive 7
healthy 1	2	3	4	5	6	unhealthy 7
forbidden 1	2	3	4	5	6	allowed 7
unaccepted 1	2	3	4	5	6	accepted 7
social 1	2	3	4	5	6	antisocial 7
unavailable 1	2	3	4	5	6	available 7
dislike 1	2	3	4	5	6	like 7

Please circle only one number on each scale.

Wearing a seat belt

unavailable 1	2	3	4	5	6	available 7
unaccepted 1	2	3	4	5	6	accepted 7
social 1	2	3	4	5	6	antisocial 7
dislike 1	2	3	4	5	6	like 7
healthy 1	2	3	4	5	6	unhealthy 7
exciting 1	2	3	4	5	6	boring 7
attractive 1	2	3	4	5	6	unattractive 7
mature 1	2	3	4	5	6	immature 7
planned 1	2	3	4	5	6	spontaneous 7
unpopular 1	2	3	4	5	6	popular 7
good 1	2	3	4	5	6	bad 7
beneficial 1	2	3	4	5	6	not beneficial 7
wrong 1	2	3	4	5	6	right 7
forbidden 1	2	3	4	5	6	allowed 7
dangerous 1	2	3	4	5	6	safe 7
feminine 1	2	3	4	5	6	masculine 7

Please circle only one number on each scale.

Smoking Marijuana

dangerous 1	2	3	4	5	6	safe 7
wrong 1	2	3	4	5	6	right 7
forbidden 1	2	3	4	5	6	allowed 7
attractive 1	2	3	4	5	6	unattractive 7
unpopular 1	2	3	4	5	6	popular 7
unavailable 1	2	3	4	5	6	available 7
dislike 1	2	3	4	5	6	like 7
social 1	2	3	4	5	6	antisocial 7
healthy 1	2	3	4	5	6	unhealthy 7
unaccepted 1	2	3	4	5	6	accepted 7
exciting 1	2	3	4	5	6	boring 7
mature 1	2	3	4	5	6	immature 7
beneficial 1	2	3	4	5	6	not beneficial 7
planned 1	2	3	4	5	6	spontaneous 7
feminine 1	2	3	4	5	6	masculine 7
good 1	2	3	4	5	6	bad 7

Please circle one number on each scale.

Using Cocaine

good 1	2	3	4	5	6	bad 7
dangerous 1	2	3	4	5	6	safe 7
forbidden 1	2	3	4	5	6	allowed 7
mature 1	2	3	4	5	6	immature 7
unpopular 1	2	3	4	5	6	popular 7
attractive 1	2	3	4	5	6	unattractive 7
unaccepted 1	2	3	4	5	6	accepted 7
social 1	2	3	4	5	6	antisocial 7
dislike 1	2	3	4	5	6	like 7
beneficial 1	2	3	4	5	6	not beneficial 7
wrong 1	2	3	4	5	6	right 7
planned 1	2	3	4	5	6	spontaneous 7
feminine 1	2	3	4	5	6	masculine 7
exciting 1	2	3	4	5	6	boring 7
healthy 1	2	3	4	5	6	unhealthy 7
unavailable 1	2	3	4	5	6	available 7

Please circle only one number on each scale.

Having Sexual Intercourse

unavailable 1	2	3	4	5	6	available 7
exciting 1	2	3	4	5	6	boring 7
mature 1	2	3	4	5	6	immature 7
wrong 1	2	3	4	5	6	right 7
good 1	2	3	4	5	6	bad 7
unaccepted 1	2	3	4	5	6	accepted 7
unpopular 1	2	3	4	5	6	popular 7
planned 1	2	3	4	5	6	spontaneous 7
dangerous 1	2	3	4	5	6	safe 7
dislike 1	2	3	4	5	6	like 7
healthy 1	2	3	4	5	6	unhealthy 7
feminine 1	2	3	4	5	6	masculine 7
forbidden 1	2	3	4	5	6	allowed 7
beneficial 1	2	3	4	5	6	not beneficial 7
attractive 1	2	3	4	5	6	unattractive 7
social 1	2	3	4	5	6	antisocial 7

Please circle only one number on each scale.

Using a Condom

feminine 1	2	3	4	5	6	masculine 7
exciting 1	2	3	4	5	6	boring 7
mature 1	2	3	4	5	6	immature 7
unaccepted 1	2	3	4	5	6	accepted 7
healthy 1	2	3	4	5	6	unhealthy 7
unpopular 1	2	3	4	5	6	popular 7
unavailable 1	2	3	4	5	6	available 7
planned 1	2	3	4	5	6	spontaneous 7
social 1	2	3	4	5	6	antisocial 7
attractive 1	2	3	4	5	6	unattractive 7
forbidden 1	2	3	4	5	6	allowed 7
dislike 1	2	3	4	5	6	like 7
wrong 1	2	3	4	5	6	right 7
good 1	2	3	4	5	6	bad 7
dangerous 1	2	3	4	5	6	safe 7
beneficial 1	2	3	4	5	6	not beneficial 7

THIS IS THE END OF THE SURVEY. THANK YOU FOR YOUR TIME.

APPENDIX B
IMAGE HIERARCHY FOR TOTAL SAMPLE BY BEHAVIOR

Superordinate Category	Subordinate Category	Percent	Frequency
Drinking Beer			
I. Positive Outcomes	a. Social Facilitation	13.1	221
	b. Fun/Pleasure	9.5	160
	c. Arousal	2.1	35
	d. Relaxation	1.9	33
	e. Sexual Facilitation	1.4	23
	f. Pos. Affective Change	1.1	19
		<u>29.1</u>	<u>491</u>
II. Negative Outcomes	a. Hangover	5.7	97
	b. Cognitive Impairment	3.5	59
	c. Punishment	2.8	47
	d. Emotional Disinhibition	2.7	46
	e. Social Impairment	2.4	41
	f. Accidents	2.1	35
	g. Neg. Affective Change	1.4	24
	h. Violence/Crime	1.3	22
	i. Neg. Outcome/General	1.3	22
	j. Death	1.1	19
	k. Addition	.8	13
	l. Weight Gain	.7	12
	m. Bad Breath	.5	9
	n. Health Damage/General	.5	8
		<u>26.8</u>	<u>454</u>
III. Negative Concepts	a. Neg. Concepts/General	14.8	250
	b. Dangerous/Scary	4.3	72
	c. Bad Taste	3.4	58
	d. Illegal	.6	11
	e. Bad Smell	.5	8
	f. Expensive	.2	4
		<u>23.8</u>	<u>403</u>
IV. Positive Concepts	a. Pos. Concepts/General	2.5	43
	b. Socially Accepted	1.1	18
	c. Good Taste	.9	16
	d. Cold/Refreshing	.3	5
		<u>4.8</u>	<u>82</u>
V. Miscellaneous	a. Context	5.6	94
	b. Getting Drunk	5.4	92
	c. Brand Names	1.6	27
	d. Family	1.4	23
	e. Social Models	.7	12
	f. Developmental Concepts	.5	8
	g. Syndrome	.4	7
		<u>15.6</u>	<u>263</u>

Superordinate Category	Subordinate Category	Percent	Frequency
Drinking Liquor			
I. Negative Outcomes	a. Hangover	9.6	155
	b. Cognitive Impairment	5.1	83
	c. Social Impairment	2.8	46
	d. Punishment	2.8	45
	e. Emotional Disinhibition	2.2	36
	f. Accidents	1.7	28
	g. Violence/Crime	1.7	28
	h. Death	1.5	24
	i. Neg. Affective Change	1.5	24
	j. Addiction	1.2	20
	k. Neg. Outcome/General	.9	14
	l. Bad Breath/Weight Gain	.6	9
	m. Health Damage/General	.5	8
		<u>32.1</u>	<u>520</u>
II. Negative Concepts	a. Neg. Concepts/General	16.0	259
	b. Bad Taste	4.3	70
	c. Dangerous/Scary	4.0	65
	d. Expensive	.9	15
	e. Illegal	.6	10
	f. Bad Smell	.3	5
		<u>26.1</u>	<u>424</u>
III. Positive Outcomes	a. Social Facilitation	8.7	141
	b. Fun	5.3	85
	c. Arousal	2.0	33
	d. Sexual Facilitation	1.7	28
	e. Relaxation	1.0	16
	f. Pos. Affective Change	1.0	16
		<u>19.7</u>	<u>319</u>
IV. Positive Concepts	a. Pos. Concepts/General	2.8	46
	b. Good Taste	1.4	23
	c. Socially Accepted	.8	13
		<u>5.0</u>	<u>82</u>
V. Miscellaneous	a. Getting Drunk	6.5	106
	b. Context	4.2	68
	c. Brand Names	2.3	38
	d. Family	1.1	18
	e. Strong	1.1	18
	f. Social Models	.9	15
	g. Developmental Concepts	.4	6
	h. Syndrome	.3	5
		<u>16.8</u>	<u>274</u>

Superordinate Category	Subordinate Category	Percent	Frequency
Smoking Cigarettes			
I. Negative Outcomes	a. Disease	14.7	246
	b. Social Stigma	14.1	237
	c. Feeling Sick	8.5	142
	d. Addiction	2.6	44
	e. Death	2.5	42
	f. Neg. Affective Change	1.4	23
	g. Punishment	.7	12
	h. Pollution	.6	10
		<u>45.1</u>	<u>756</u>
II. Negative Concepts	a. Neg. Concepts/General	22.2	372
	e. Bad Smell	6.1	102
	c. Bad Taste	2.2	37
	b. Dangerous/Scary	1.6	27
	f. Expensive	1.2	20
		<u>33.3</u>	<u>558</u>
III. Positive Outcomes	a. Social Facilitation	2.3	39
	d. Relaxation	2.0	34
	c. Arousal	2.0	17
	b. Fun	.7	12
		<u>6.0</u>	<u>102</u>
IV. Positive Concepts	a. Pos. Concepts General	1.4	23
	b. Soc. Accepted/Available	.4	6
		<u>1.8</u>	<u>29</u>
V. Miscellaneous	a. Smoke	4.9	82
	b. Smell	3.3	56
	c. Brand Names	1.5	25
	e. Social Models	1.3	24
	d. Family	1.2	22
	f. Developmental Concepts	.5	9
	g. Context	.4	8
	g. Syndrome	.4	7
		<u>13.8</u>	<u>233</u>

Smoking Marijuana

I. Negative Concepts	a. Neg. Concepts General	26.3	411
	b. Dangerous	4.4	68
	c. Bad Smell	2.3	36
	d. Expensive	1.6	25
	e. Illegal	1.5	23
	f. Bad Taste	.8	12
		<u>36.9</u>	<u>575</u>

Superordinate Category	Subordinate Category	Percent	Frequency
II. Negative Outcomes	a. Cogn. Motor/Impairment	8.3	129
	b. Social Impairment	5.0	78
	c. Disease	3.5	55
	d. Death	3.2	50
	e. Neg. Outcomes/General	2.6	41
	f. Feeling Sick	2.6	40
	g. Addiction	2.2	35
	h. Punishment	1.7	26
	i. Neg. Affective Change	1.1	17
	j. Red Eyes/Dry Mouth	1.0	15
	k. Crime/Violence	.4	7
	l. Emotional Disinhibition	.3	5
		<u>31.9</u>	<u>498</u>
III. Positive Outcomes	a. Relaxation	3.3	52
	b. Fun	3.1	49
	c. Social Facilitation	3.0	47
	d. Pos. Affective Change	1.4	22
	e. Arousal	.7	11
	f. Sexual Facilitation	.5	8
	g. Pos. Outcomes/General	.1	2
		<u>12.1</u>	<u>191</u>
IV. Positive Concepts	a. Pos. Concepts/General	2.1	33
	b. Socially Accepted	.7	11
	c. Available	.3	5
		<u>3.1</u>	<u>49</u>
V. Miscellaneous	a. Getting High	5.9	92
	b. Social Models	3.0	47
	c. Syndrome	2.4	38
	d. Smoke	1.5	24
	e. Smell	1.4	22
	f. Family	.8	12
	g. Context	.6	10
	h. Developmental Concepts	.3	5
		<u>15.9</u>	<u>250</u>

Using Cocaine

I. Negative Concepts	a. Neg. Concepts General	34.5	474
	b. Dangerous	5.7	78
	d. Expensive	4.9	67
	e. Illegal	2.0	27
	f. Bad Taste	.6	8
		<u>47.7</u>	<u>654</u>

Superordinate Category	Subordinate Category	Percent	Frequency
II. Negative Outcomes	a. Death	11.0	151
	b. Addiction	5.4	74
	c. Social Impairment	4.4	61
	d. Nose Problems	4.3	59
	e. Disease	3.1	43
	f. Neg. Outcomes/General	2.8	38
	g. Crime/Violence	2.1	29
	h. Neg. Affective Change	2.1	29
	i. Cognitive Impairment	2.0	28
	j. Punishment	2.0	27
	k. Accidents	.8	11
	l. Emotional Disinhibition	.7	9
	m. Withdrawal Symptoms	.5	7
	n. Feeling Sick	.4	5
		41.6	571
III. Positive Outcomes	a. Social Facilitation	1.6	22
	b. Arousal	1.5	21
	c. Fun	.4	6
	d. Pos. Affective Change	.4	5
	e. Sexual Facilitation	.4	2
		4.3	59
IV. Positive Concepts	a. Pos. Concepts/General	.8	11
V. Miscellaneous	a. Getting High	3.0	41
	b. Social Models	1.3	18
	c. Context	.6	8
	d. Family	.4	6
	e. Syndrome	.2	3
	f. Developmental Concepts	.2	3
		5.7	79

Having Sex

I. Positive Outcomes	a. Fun	17.4	257
	b. Love/Romance	7.0	104
	c. Arousal	7.0	104
	d. Pos. Affective Change	3.6	53
	e. Intimacy/Affiliation	3.3	49
	f. Gratification/Orgasm	2.1	31
	g. Social Facilitation	1.1	16
	h. Relaxation	.8	12
		42.3	626
II. Negative Outcomes	a. Disease/AID's	7.1	105
	b. Neg. Outcomes/General	1.8	27
	c. Social Stigma	1.4	21
	d. Neg. Affective Change	1.1	16
	e. Physical Pain	.5	8
	f. Abortion	.3	4
	g. Punishment	.3	4
		12.5	185
III. Positive Concepts	a. Pos. Concepts/General	12.4	183

Superordinate Category	Subordinate Category	Percent	Frequency
IV. Negative Concepts	a. Dangerous	6.2	92
	b. Neg. Concepts/General	3.4	50
		<u>9.6</u>	<u>142</u>
V. Miscellaneous	a. Pregnancy	7.4	109
	b. Safety Concerns	6.4	95
	c. Relationship Type	5.2	77
	d. Location	1.5	22
	e. Developmental Concepts	1.0	15
	f. Social Models	.9	13
	g. Family References	.5	7
	h. Syndrome	.3	5
		<u>23.2</u>	<u>343</u>

Using A Condom			
I. Positive Concepts	a. Safe	20.7	283
	b. Smart/Good Idea	14.3	195
	c. Pos. Concepts/General	10.5	144
	d. Easy	.8	11
		<u>46.3</u>	<u>633</u>
II. Positive Outcomes	a. Prevents Disease	6.9	95
	b. Prevents Pregnancy	6.4	88
	c. Social Approval	1.7	23
	d. Reduces Worry	1.3	18
	e. Pos. Outcomes/General	.4	5
		<u>16.7</u>	<u>229</u>
III. Negative Outcomes	a. Physical Discomfort	6.1	84
	b. Reduced Pleasure	4.6	63
	c. Embarrassment	1.8	25
	d. Ruins/Interrupts Mood	1.8	24
	e. Reduced Intimacy	1.0	13
	f. Neg. Outcomes/General	.7	10
		<u>16.0</u>	<u>219</u>
IV. Negative Concepts	a. Neg. Concepts/General	5.6	76
	b. Unreliable	4.8	65
	c. Disease	3.8	52
	d. Expensive	.7	9
	e. Boring	.5	7
	f. Difficult to Remember	.3	4
		<u>15.7</u>	<u>213</u>
V. Miscellaneous	a. Pregnancy	2.3	32
	b. Texture/Color	2.0	27
	c. Developmental Concepts	.6	8
	d. Social Models	.5	7
		<u>5.4</u>	<u>74</u>

Superordinate Category	Subordinate Category	Percent	Frequency
Exercising			
I. Positive Outcomes	a. Fun	9.8	167
	b. Improved Health/General	6.5	110
	c. Muscle Building	6.3	107
	d. Being in Shape	5.0	86
	e. Weight Loss	4.4	75
	f. Pos. Affective Change	3.6	61
	g. Improv. Appear./General	3.2	55
	h. Pos. Outcomes/General	3.2	54
	i. Arousal/Excitement	2.6	45
	j. Social Facilitation	1.9	33
	k. Increased Energy	1.6	28
	l. Relaxation	1.4	24
	m. Sexual Facilitation	.4	7
		<u>49.9</u>	<u>852</u>
II. Positive Concepts	a. Pos. Concepts/General	8.6	147
III. Negative Concepts	a. Difficult	2.8	48
	b. Neg. Concepts/General	2.2	37
	c. Boring	1.7	29
	d. Time Consuming	1.6	27
		<u>8.3</u>	<u>141</u>
IV. Negative Outcomes	a. Fatigue	5.2	88
	b. Pain	2.0	34
	c. Neg. Outcomes/General	.9	15
		<u>8.1</u>	<u>137</u>
V. Miscellaneous	a. Sport Types	14.6	249
	b. Sweat	7.2	123
	c. Context	1.9	33
	d. Syndrome	.6	11
	e. Social Models	.4	7
	f. Family	.2	3
		<u>24.9</u>	<u>426</u>

Wearing A Seatbelt			
I. Positive Outcomes	a. Protection	32.5	496
	b. Secure Feeling	2.7	42
	c. No Ticket	1.4	22
	d. Peer/Parental Approval	.9	14
		<u>37.5</u>	<u>574</u>
II. Negative Concepts	a. Inconvenient	17.7	270
	b. Accidents	5.9	90
	c. Neg. Concepts/General	4.9	75
	d. Police/Tickets	1.8	27
	e. Dangerous	1.0	16
	f. Difficult To Remember	.7	10
	g. Boring	.3	5
		<u>32.3</u>	<u>493</u>

Superordinate Category	Subordinate Category	Percent	Frequency
III. Positive Concepts	a. Pos. Concepts/General	15.7	240
	b. Easy	2.9	44
	c. Legal	.8	12
		<u>19.4</u>	<u>296</u>
IV. Negative Outcomes	a. Death	1.4	22
	b. Being Trapped	1.1	17
	c. Social Stigma	1.0	16
	d. Health Risks/General	.6	9
		<u>4.1</u>	<u>64</u>
V. Miscellaneous	a. A Law	4.9	75
	b. Social Influences	.9	13
	c. Family	.9	13
		<u>6.7</u>	<u>101</u>

APPENDIX C
IMAGE HIERARCHY FOR COMBINED IMAGE
CATEGORIES BY BEHAVIOR

Superordinate Category	Subordinate Category	Percent	Frequency
Drinking Beer			
I. Positive Outcomes	a. Social	23.2	392
	b. Physical	4.0	68
	c. Emotional	1.8	38
		<u>29.0</u>	<u>498</u>
II. Negative Outcomes	a. Physical	15.1	256
	b. Social	6.5	110
	c. Emotional	4.1	70
	d. Other	1.1	18
		<u>26.8</u>	<u>454</u>
III. Negative Concepts	--	23.8	403
IV. Positive Concepts	--	4.8	82
V. Miscellaneous	--	15.5	263
Drinking Liquor			
I. Negative Outcomes	a. Physical	20.2	327
	b. Social	7.4	119
	c. Emotional	3.7	60
	c. Other	.9	14
		<u>32.2</u>	<u>520</u>
II. Negative Concepts	--	26.2	424
III. Positive Outcomes	a. Social	15.4	249
	b. Physical	3.0	49
	c. Emotional	1.3	21
		<u>19.7</u>	<u>319</u>
IV. Positive Concepts	--	5.1	82
V. Miscellaneous	--	16.9	274
Smoking Cigarettes			
I. Negative Outcomes	a. Physical	28.5	478
	b. Social	14.8	249
	c. Other	1.8	38
		<u>45.0</u>	<u>756</u>

Superordinate Category	Subordinate Category	Percent	Frequency
II. Negative Concepts	--	33.3	558
III. Positive Outcomes	a. Social	3.0	51
	b. Physical	3.0	51
		<u>6.0</u>	<u>102</u>
IV. Positive Concepts	--	1.7	29
V. Miscellaneous	--	13.9	233

Smoking Marijuana

I. Negative Concepts	--	36.9	577
II. Negative Outcomes	a. Physical	21.0	329
	b. Social	7.1	111
	c. Other	2.2	34
	d. Emotional	1.4	22
		<u>31.7</u>	<u>496</u>
III. Positive Outcomes	a. Social	6.7	104
	b. Physical	4.2	65
	c. Emotional	1.4	22
		<u>12.3</u>	<u>191</u>
IV. Positive Concepts	--	3.1	49
V. Miscellaneous	--	16.0	250

Using Cocaine

I. Negative Concepts	--	47.6	654
II. Negative Outcomes	a. Physical	27.9	384
	b. Social	8.5	117
	c. Emotional	2.8	38
	d. Other	2.3	32
		<u>41.5</u>	<u>571</u>
III. Positive Outcomes	a. Social	2.4	33
	b. Physical	1.5	21
	c. Emotional	.4	5
		<u>4.3</u>	<u>59</u>
IV. Positive Concepts	--	.8	11
V. Miscellaneous	--	5.7	79

Superordinate Category	Subordinate Category	Percent	Frequency
Having Sexual Intercourse			
I. Positive Outcomes	a. Social	28.8	426
	b. Physical	9.9	147
	c. Emotional	3.6	53
		<u>42.3</u>	<u>626</u>
II. Negative Outcomes	a. Physical	8.8	130
	b. Social	1.7	25
	c. Emotional	1.1	16
	d. Other	.9	14
		<u>12.5</u>	<u>185</u>
III. Positive Concepts	--	12.4	183
IV. Negative Concepts	--	9.6	142
V. Miscellaneous	--	23.2	343
Using a Condom			
I. Positive Concepts	--	46.6	638
II. Positive Outcomes	a. Physical	13.4	183
	b. Social	1.7	23
	c. Emotional	1.3	18
		<u>16.4</u>	<u>224</u>
III. Negative Outcomes	a. Physical	6.1	84
	b. Social	4.8	65
	c. Emotional	4.6	63
	d. Other	.5	7
		<u>16.0</u>	<u>219</u>
IV. Negative Concepts	--	15.6	213
V. Miscellaneous	--	5.4	74
Exercising			
I. Positive Outcomes	a. Physical	28.1	478
	b. Social	15.4	262
	c. Emotional	3.6	61
	d. Other	3.6	53
		<u>50.1</u>	<u>852</u>
II. Positive Concepts	--	8.6	147
III. Negative Concepts	--	8.3	141
IV. Negative Outcomes	a. Physical	8.0	136
V. Miscellaneous	--	25.0	426

Superordinate Category	Subordinate Category	Percent	Frequency
	Wearing A Seat Belt		
I. Positive Outcomes	a. Physical	32.5	496
	b. Emotional	2.7	42
	c. Social	2.4	36
		<u>37.6</u>	<u>574</u>
II. Negative Concepts	--	32.3	493
III. Positive Concepts	--	19.4	296
IV. Negative Outcomes	a. Physical	3.1	48
	b. Social	1.0	16
		<u>4.1</u>	<u>64</u>
V. Miscellaneous	--	6.6	101