

A Motivational Perspective on Risky Behaviors: The Role of Personality and Affect Regulatory Processes

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ABSTRACT The present study tested a motivational model in which personality influences on risky behaviors were hypothesized to be primarily indirectly mediated, by shaping the nature and quality of emotional experience as well as characteristic styles of coping with these emotions. This model was tested in a representative community sample of 1,666 young adults, aged 18 to 25 years old. Results revealed strong support for the model, indicating that broad traits related to neuroticism and extraversion promote involvement in alcohol use and risky sex via distinct pathways. Neurotic individuals were prone to engage in risky behaviors as a way to cope with aversive mood states, whereas extraverted individuals were more likely to engage in risky behaviors as a way to enhance positive affective experience. In contrast, impulsivity directly predicted some forms of risk taking, and interacted with extraversion and neuroticism to predict motives for risky behaviors. The model provides a highly general though not complete account of risky behaviors.

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Traditional personality perspectives on risk taking have proposed that people are differentially prone to take risks because of some stable underlying individual difference in risk-seeking propensity. Though variants on this model exist, most share the view that risk takers experience chronically low arousal or, more specifically, under-activation of the behavioral inhibition system (e.g., Fowles, 1980; Zuckerman, 1983). Theoretically, by engaging in risky or dangerous behaviors that would be sufficiently intense to produce unpleasant affect in ordinary persons, risk takers increase their low arousal state to a more optimum level.

An alternative view recognizes that risky behaviors can serve many different goals or functions in addition to management of arousal states. For example, people may engage in risky behaviors as a way to develop certain competencies or skills (e.g., by driving at high speeds on a winding mountain road), to meet affiliative or intimacy needs (e.g., by having sex with a new sexual partner), or to cope with dysphoric mood (e.g., by having a drink to cheer up; see Chassin, Presson, & Sherman, 1987; Cooper, 1994; Cooper, Shapiro, & Powers, 1998, for additional detail). Thus, according to this view, personality influences risky behaviors indirectly by activating certain needs, goals, or motives which in turn are met by engaging in risky behaviors. Consistent with this perspective, the present study develops and tests a model in which motivations to regulate affect substantially mediate the effects of core personality traits on risky behaviors.

As shown in Figure 1, we posit two distinct motivational pathways: Risky behaviors may result from a desire to pursue or enhance positive affect and feelings of well-being (what we call enhancement motives), or a desire to avoid or escape aversive emotional states (what we call coping motives). According to this model, neuroticism (or negative emotionality) primarily drives coping motives, whereas extraversion (or positive emotionality) primarily drives enhancement motives. In contrast, impulsivity is expected both to interact with neuroticism and extraversion in the prediction of coping and enhancement motives, respectively, and to directly predict risky behaviors. Finally, motives also are hypothesized to directly predict risky behaviors, and to substantially mediate the effects of personality on these behaviors.

Implicit in our model are several assumptions about the nature of risky behaviors. Unlike in traditional risk models, we do not assume that people engage in risky behaviors because they seek risk or that they even recognize the risk inherent in their behaviors. Indeed, as Jessor (1991)

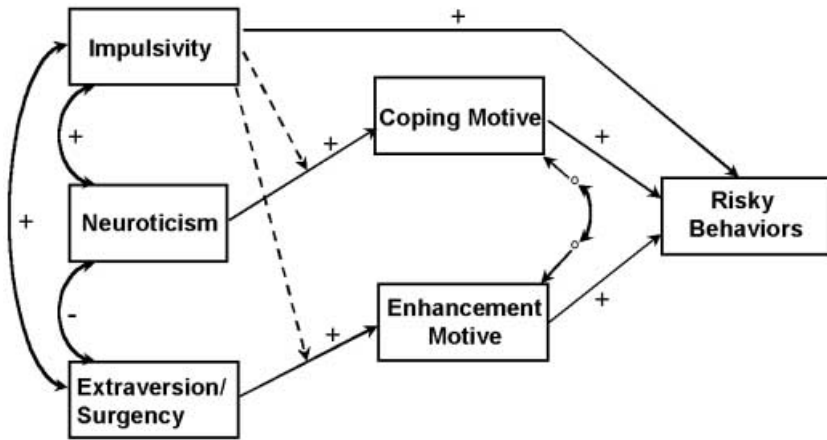


Figure 1
Hypothesized model.

has argued, people do not typically smoke for the thrill of seeing whether they can avoid lung cancer, or have unprotected sex for the thrill of beating the odds of contracting a sexually transmitted disease. Rather, they engage in these behaviors because they offer an immediate gain or benefit which the individual judges (consciously or not) to be worth the risk of longer term negative consequences. Thus, the salient feature of risky behaviors, from our perspective, is that they involve a trade-off between short-term, usually affective, gains and potential long-term costs. Accordingly, our model requires only that individuals recognize the capacity of a given risky behavior to alter mood states—whether by alleviating a negative mood or enhancing a neutral or positive one.

Finally, although we view our model as a general one for understanding risky behaviors, the present study focuses on two specific exemplars: heavy or problematic alcohol use and risky sex. These behaviors were chosen not only because they are considered prototypic risk behaviors (Byrnes, Miller, & Schafer, 1999), but also because they are widespread in contemporary society and have potentially devastating consequences. Moreover, and not coincidentally we suspect, both have a profound capacity to alter behavior.

Theoretical Background and Rationale

Neuroticism, extraversion, and impulsivity are considered core aspects of personality. Indeed, neuroticism and extraversion are represented as higher-order factors in every major taxonomic scheme of personality (John, 1990). Perhaps more important for our purposes, these personality dimensions are inextricably linked with the experience of positive and negative emotions, and by extension with affect regulatory processes (Tellegen, 1985; see also Watson & Clark, 1984). Although impulsivity has been treated more inconsistently in structural models of personality (Revelle, 1997), it too is represented in one form or another in all major models. In fact, an impulsivity/constraint dimension is identified as the third factor, along with extraversion and neuroticism-like constructs, in most Big Three models of personality (John, 1990). Finally, there is strong empirical evidence (see Sher, Trull, Bartholow, & Vieth, 1999, for a review) linking these three dimensions of personality to diverse risk-taking behaviors (see also Caspi et al., 1997, for prospective data). Thus, not only is there substantial agreement that these are core dimensions of personality, but they also have special relevance for affect regulatory mechanisms and for risky behaviors.

Neuroticism and extraversion. Neuroticism is a broad dimension of normal personality defined by heightened emotional lability, hypersensitivity to criticism, self-doubt, alienation, and a tendency to dwell on the negative. In contrast, extraversion is characterized by high levels of activity, assertiveness, confidence, venturesomeness, and sociability (Costa & McCrae, 1980). According to Tellegen (1985), each of these personality dimensions represents a “preparedness to respond” with specific emotional reactions, and can best be viewed as distinctive and pervasive positive and negative affective systems.

Stable individual differences in neuroticism and extraversion are thought to be based in neurologically distinct motivational systems, called the behavioral inhibition (BIS) and behavioral activation (BAS) systems, respectively (Gray, 1990). The BIS controls the experience of negative emotions and regulates aversive motivation causing movement away from undesired end states (avoidance behavior). Thus, neurotic individuals—who are presumed to be high in BIS sensitivity—are more responsive to threat and punishment cues which, in turn, predisposes them to negative affective states and to avoidant behaviors. In contrast,

the BAS controls the experience of positive emotions, and regulates appetitive motivation causing movement toward desired end states (approach behavior). Thus, extraverts—who are thought to be high in BAS sensitivity—are especially responsive to reward cues, which in turn predisposes them to positive affective states and to reward-seeking behaviors (see Larsen & Ketelaar, 1991, for supporting data).

Based on the foregoing, we hypothesize that neurotic individuals should be highly motivated to engage in risky behaviors as a way to cope with or ameliorate chronically high levels of negative emotions. As Baumeister and Scher (1988) have argued, the experience of a negative emotional state should, in and of itself, encourage risky behavior by increasing the attractiveness of the immediate relief offered by the risky behavioral choice. Thus, high levels of negative affect should create in neurotic individuals not only the need to cope with dysphoric mood states, but also the propensity to do so in potentially self-destructive or risky ways.

In contrast, we hypothesize that people who are high in extraversion should be more likely to engage in risky behaviors as a way to enhance positive emotions and affective experience. Moreover, their heightened sensitivity to reward cues should make them particularly susceptible to the reward value of a risky behavioral choice. Thus, we expect that both neurotic and extraverted individuals will report higher overall levels of risky behavior, though the underlying motives should differ. In the former case, risk taking should be driven by aversive motivation processes aimed at minimizing or reducing negative emotional states, whereas in the latter case, it should be driven by appetitive processes aimed at seeking out positive emotional states or experiences.

Impulsivity. Impulsivity is typically thought to include two components: (1) resisting versus giving in to urges, impulses, or desires; and (2) responding immediately and impetuously to a stimulus versus reflecting and planning before taking action. Thus, the highly impulsive person is marked by a relative inability to control thoughts and behavior (Revelle, 1997). Such difficulties are thought to stem from deficits in working memory and higher-order cognitive functions that would ordinarily give rise to hindsight, forethought, anticipatory behavior, and goal-directed or purposive action, as well as from deficits in the self-regulation of affect, motivation, and arousal (Barkley, 1997). Accordingly, the highly impulsive person when faced with a conflict between immediate positive and distal

negative consequences is prone to choose that course of action that maximizes immediate gains. Such an individual is unlikely to foresee future costs, or forego immediate satisfaction. In short, to the extent that engaging in risky behavior either increases rewards or decreases aversive consequences in the immediate situation, impulsive individuals are likely to choose that option. Thus, impulsive individuals should report higher overall levels of risky behavior as a direct consequence of deficient impulse control.

Finally, we expect impulsivity to interact with neuroticism and extraversion to predict coping and enhancement motives, respectively. As previously discussed, impulsive individuals should be especially susceptible to the immediate reinforcing properties of a risky behavioral choice, whether that choice is negatively or positively reinforced. Thus, we hypothesize that impulsivity will facilitate the expression of whatever response tendency is dominant for an individual. Accordingly, highly impulsive extraverts (who are dispositionally responsive to reward cues) should be most likely to engage in risky behaviors to enhance, whereas highly impulsive neurotics (who are dispositionally responsive to punishment cues) should be most likely to engage in risky behaviors to cope with aversive mood states. In short, we view impulsivity as a facilitator, energizer, or releaser of prepotent response tendencies, which in turn are dictated by one's standing on neuroticism and extraversion.

The Present Study

The present study tests a motivational model of risky behaviors that views engaging in such behaviors as one important way to manage or regulate affective experience. According to this model, personality influences risky behaviors primarily indirectly, by shaping the nature and quality of emotional experience as well as characteristic styles of coping with these emotions. We view this model as a highly general model, though not a complete one. Thus, although we expect to obtain strong support for the indirect pathways we have specified, we do not anticipate that affect regulatory motives will account fully for the effects of personality on risky behaviors.

METHOD

Sample and Procedure

Data for the present study were obtained from the second wave of a longitudinal study of adolescents, interviewed in 1989–1990 and again 4.5 years later. At Time 1 (T1), random-digit-dial techniques were used to identify a sample of 2,544 adolescents, aged 13 to 19, residing in Buffalo, New York. Telephone exchanges in areas populated primarily by Blacks were oversampled. Interviews were completed with 81% of the identified sample at T1 ($n = 2,052$), and 88% of these ($n = 1,814$) were reinterviewed at Time 2 (T2). The T2 sample did not differ from the initially ascertained sample in racial composition or socioeconomic status. Across both waves, however, more females than males were interviewed (77% vs. 66% of the original sample). Finally, younger respondents also were more likely to be reinterviewed at T2 (16.7 years vs. 17.2 years at T1, $p < .001$), though no age differences were found in initial participation rates.

Face-to-face, computer-assisted interviews, including both self- and interviewer-administered portions, were conducted in private by trained same-sex interviewers. More sensitive questions (e.g., on condom use and sexual behavior) were self-administered, with the interviewer present to assist if needed. Respondents were paid \$25 for their participation. (See Cooper & Orcutt, 1997, and Cooper, Peirce, & Huselid, 1994, for details.)

The present study primarily used data from the second wave of interviews, which included more extensive personality measures than the T1 interviews. Respondents who had neither consumed alcohol nor had intercourse in the previous 6 months were excluded from all analyses; 74 sexually active respondents who were pregnant or trying to get pregnant and reported no risky practices in the previous 6 months were also excluded from the sexual behavior analyses. Thus, 1,666 respondents (92% of the T2 sample) were included in one or both sets of analyses. Included respondents were 21.4 years old on average (range = 17–26 years); 53% were women, 50% were White, 42% were Black, and 8% were members of other ethnic/racial groups.

Measures

All measures included in the present study were scored so that higher scores equal more of the measured construct. Table 1 provides correlations among the study variables.

Demographic and background covariates. Race (0 = non-White, 1 = White), gender (0 = female, 1 = male), T2 age (in years), and T1 levels of prior involvement in the outcome behavior were controlled in all analyses. For the T1 alcohol covariate, a composite of two items (usual amount consumed per

Table 1
Zero-Order Correlations Among Study Measures

<i>Measure Name</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
<i>Personality variables</i>																
1 Neuroticism	–	–.19***	.25***	.39***	.09**	.07**	.19***	.05 ^t	.29***	.01	.08**	–.06*	–.02	–.17***	.05*	–.09**
2 Surgency		–	.30***	.06*	.24***	.27***	.09***	.11***	.12***	.22***	.15***	.05 ^t	.03	.21***	.09***	–.01
3 Impulsivity			–	.21***	.19***	.23***	.18***	.11***	.19***	.11***	.12***	–.05 ^t	.00	.06*	.10***	–.11***
<i>Alcohol variables</i>																
4 Coping Motive				–	.42***	.42***	.34***	.20***	.37***	.06 ^t	.07*	–.03	.05	.05 ^t	.01	–.00
5 Enhancement Motive					–	.56***	.34***	.28***	.21***	.31***	.17***	.02	.06*	.20***	.13***	–.01
6 Heavy Drinking						–	.42***	.32***	.22***	.15***	.19***	.01	.10***	.29***	.12***	.04
7 Drinking Problems							–	.23***	.16***	.08*	.15***	–.01	.08*	.16***	.09**	.05*
8 T1 Alcohol Experience								–	.06*	.15***	.09**	–.09**	.39***	.05*	.27***	.43***
<i>Sex variables</i>																
9 Coping Motive									–	.27***	.20***	.04	.07**	.17***	–.10***	–.03
10 Enhancement Motive										–	.23***	–.07**	.15***	.10***	.01	.05 ^t
11 Risky Practices											–	.04	.07**	.16***	–.02	–.02
12 Condom Use												–	–.09**	.14***	–.06*	–.12***
13 T1 Sexual Experience													–	.09**	–.09**	.51***
<i>Demographic variables</i>																
14 Gender														–	.07**	.04
15 Race															–	.00
16 Age																–

Note. T1 = Time 1; NA = Not applicable. For gender, females were coded 0, males were coded 1. For race, non-Whites were coded 0, Whites were coded 1.

^t $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

drinking occasion, frequency of drinking to intoxication) was used, with T1 abstainers scored as 0. For the sexual behavior covariate, an ordinal variable was created indicating whether at T1 the respondent had no prior sexual contact, had engaged in sexual activities short of intercourse (e.g., petting), or had had intercourse. Controlling for prior experience helped to rule out the possibility that contemporaneous associations between risky behaviors, personality, and motives were due to the prior common influence of past behaviors.

Personality dimensions. Three dimensions of personality were assessed in the present study—neuroticism, extraversion/surgency, and impulsivity. These dimensions bear close resemblance to the three-factor models of both Tellegen (1985; positive emotionality, negative emotionality, constraint) and Eysenck (1991; extraversion, neuroticism, psychoticism), and to three of the five Big Five dimensions (extraversion, neuroticism, [low] conscientiousness; Costa & McCrae, 1992).

Neuroticism was assessed by a composite of three measures, each included in an abbreviated form: (1) Eysenck and Eysenck's (1985) neuroticism scale (10 items, $\alpha = .74$); (2) Nolen-Hoeksema's (1991) trait measure of ruminative coping style (9 items; $\alpha = .88$); and (3) Rosenberg's (1965) self-esteem scale, reverse-scored (5 items; $\alpha = .80$). Individual scales were standardized, and composited ($\alpha = .63$). Overall, this composite can be thought of as assessing the extent to which an individual is dispositionally prone to experience negative emotions, focuses on his or her negative mood states, and holds negative self-cognitions.

Extraversion was assessed by a composite of four measures: (1) a short form of Eysenck and Eysenck's (1985) extraversion scale (9 items, $\alpha = .64$); and brief measures of (2) social dominance (5 items, $\alpha = .84$; Bernstein et al., 1989); (3) thrill-seeking (6 items; $\alpha = .80$; Bernstein et al., 1989); and (4) sensation-seeking ($\alpha = .82$; Schafer, Blanchard, & Fals-Stewart, 1994).¹ Individual scales were standardized, then composited ($\alpha = .61$). Thus, the higher order composite assesses primary traits associated with extraversion, including assertiveness, social dominance, activity, and venturesomeness. Because sociability is not well represented in the composite, this measure may be better thought of as a measure of agentic (as opposed to communal) positive emotionality (Tellegen et al., 1988), or surgency. Finally, although considerable controversy exists about the placement of the more narrowly defined traits of thrill and sensation seeking in broader models of personality, inclusion of these traits on the higher-order

1. Although some measures of sensation-seeking and related constructs include specific reference to risky behaviors such as drinking, none of the items included in any of the measures used in the present study explicitly referred to alcohol use, drug use, or sexual behavior.

extraversion factor is consistent with contemporary views of extraversion (e.g., John, 1990), in particular with its placement in the Big Five model (Costa & McCrae, 1992).²

2. One possible concern with the use of broad-band composites is that a facet of the composite, rather than the composite itself, may account for observed relationships between the composite and other variables in the model. To assess this possibility, we estimated several additional structural equation models similar in every respect to those reported in the body of the paper, except that latent variables (LVs) were specified for neuroticism (indicated by the three previously described measures) and extraversion (indicated by the four previously described measures). A saturated model was estimated, in which all effects among the factors and latent constructs were freely estimated, and all specific effects of individual indicators were constrained to 0. For the alcohol model, results of this test were identical in terms of pattern and significance to those reported in Figure 2A. That is, in no case did a significant effect become nonsignificant or vice-versa. Results were identical for the risky sex model, with two exceptions. Neuroticism no longer directly predicted enhancement motives, and the direct effect of extraversion on condom use fell just below the $p < .10$ cutoff. Modification indices were then examined to identify specific effects of the seven manifest indicators that, if freed, would improve overall model fit. For the alcohol model, five such effects were found. Freeing each in turn led to significant increments in fit, but in no case substantially altered the direct effects of the associated latent construct. Likewise, four specific effects were found for the risky sex model. Freeing each in turn again led to significant improvements in overall model fit, but in no case substantially altered the direct effects of the associated latent construct. Considered together, these supplemental analyses indicate that, although specific effects of individual indicators may exist, they do not account for the effects of the latent constructs as a whole, thus lending clear support to the validity of our measurement model.

One final set of analyses was conducted to more directly address a reviewer concern that the results for the extraversion composite were entirely due to the thrill- and sensation-seeking components. Two additional EQS models were estimated identical to the models described in the body of the paper, with one exception—either a composite of the thrill- and sensation-seeking measures or the Eysenck measure itself was used in lieu of the extraversion composite. Results indicated that the effects of the thrill and sensation-seeking composite were highly similar to those obtained with the Eysenck measure, though both were weaker than the results obtained with the original extraversion composite. Interestingly, the major differences across models involved effects for the other two personality dimensions. In one case, because impulsivity was less strongly correlated with the Eysenck measure than with either the thrill- and sensation-seeking composite or the broad-band extraversion composite, impulsivity exerted small but significant effects in the model using the Eysenck measure that were not observed in any other model. Similarly, neuroticism exerted small but significant effects not observed in any other model when the Eysenck measure was used, apparently as a result of suppression stemming from the moderate negative correlation between the Eysenck extraversion scale and the neuroticism composite. In sum, even though several individual effects varied

Impulsivity was assessed by eight items that assess the extent to which one typically acts quickly and without forethought versus is planful and cautious ($\alpha = .76$; adapted from Eysenck, 1967).

Drinking motives. Two five-item scales developed by Cooper (1994; Cooper, Russell, Skinner, & Windle, 1992) were used to measure coping and enhancement motives for alcohol use (α s = .88 and .90, respectively). Drinking to cope is defined as the strategic use of alcohol to alleviate, minimize, or escape from negative emotional states, whereas drinking to enhance is defined as the strategic use of alcohol to enhance positive emotional experiences. Respondents rated the extent to which they drank for each reason during the past 6 months on a 1 (*almost never/never*) to 5 (*almost always/always*) scale.

Sex motives. Two scales developed by Cooper et al. (1998) were used to measure the relative frequency of having sex in the prior 6 months to enhance positive or cope with negative affect (α s = .85 and .81, respectively). Respondents answered on the same 1 to 5 Likert scale described above.

Alcohol use behaviors. Two measures of heavy or problematic alcohol use were included.

Frequency of heavy drinking was measured by a composite of two items: frequency of drinking to intoxication and frequency of drinking five or more drinks ($\alpha = .85$). Both items were rated on a 1 to 9 scale, where 1 = *never* and 9 = *5 times a week or more*.

Drinking problems were assessed by the Short Michigan Alcoholism Screening Test (11 items; Selzer, Vinokur, & van Rooijen, 1975). Respondents were asked to indicate whether they had experienced difficulties in meeting important social obligations (e.g., at work or home) because of their drinking; had problems with significant others (e.g., a dating partner or spouse) related to their drinking; had legal problems; or sought help or worried about their drinking. An index was derived by counting the number of different problems that had occurred one or more times in the past 6 months. To reduce skewness on the analytic variable, individuals reporting more than four problems (< 2% of the sample) were recoded to 4.

Risky sexual behaviors. Two primary indicators of risky sexual behaviors were included.

Number of risky sexual practices was assessed by eight to nine specific sexual practices (depending on gender) that have been identified by the Centers for

across the alternative models, these analyses support our use of the broad-band composite measures and suggest that their use in no way significantly distorts the patterns of association among these constructs.

Disease Control and Prevention (1991) as “high risk” for contracting the HIV virus. These included: anal intercourse, “one-night stands,” intercourse with a stranger or a prostitute, intercourse in exchange for drugs or money, and intercourse with someone who has had many partners, used IV drugs, or is HIV positive. For males, same-sex intercourse also was included. To reduce skewness on the analytic variable, respondents who endorsed four or more risk behaviors (< 1% of the sample) were recoded to 4.

Frequency of condom use in the prior 6 months was assessed on a 6-point scale where 1 = *none of the time* and 6 = *every time* the respondent had sex. Respondents provided independent frequency ratings of their condom use with up to two different partners or partner types (e.g., casual vs. serious; see Cooper, Agocha, & Powers, 1999, for details). For those with two ratings, a composite variable was computed in which the frequency of using condoms with each partner (type) was weighted by the frequency of intercourse with that partner (type), and then summed. Nearly 31% of the sample never used, whereas 20% always used, a condom in the past 6 months.

RESULTS

Data Analytic Procedures

Path analyses were conducted with EQS (Bentler, 1995) using partial (controlling for the previously described covariates) variance-covariance matrices as input. Following procedures described by Bollen (1989), we corrected for random measurement error by setting the error variance associated with each variable equal to the product of its variance and the quantity 1 minus its estimated reliability. For measures with alphas > .80, coefficient alpha was used as the estimated reliability. For those with alphas below .80, .80 was used. Use of lower reliability estimates may produce untrustworthy (e.g., out-of-range) parameter estimates due to over-correction for unreliability (Lord & Novick, 1968).

We tested interaction hypotheses using hierarchical moderated regression and probed significant interactions following procedures outlined by Aiken and West (1991). To reduce nonessential collinearity (Aiken & West, 1991), all variables (except dichotomies) were centered before the interactions were computed and tested. To plot interactions, simple slopes were estimated at values corresponding to the 10th and 90th percentiles. Finally, following recommendations of McClelland and Judd (1993), we use a $p < .10$ cutoff to partially compensate for the low power of interaction tests in field studies such as ours.

Personality, Motives, and Alcohol Involvement

Overall model test. A just-identified model was estimated in which personality factors were allowed to directly predict both motives, and all motive and personality factors were allowed to directly predict both alcohol outcomes. In addition, the three personality factors were allowed to freely correlate, as were disturbances between the two motives. Finally, heavy drinking—which can be viewed as causally prior to the development of drinking problems—was allowed to directly predict drinking problems. Results of the initial model test revealed five nonsignificant ($p > .10$) paths. These were dropped and a trimmed model was reestimated.

The trimmed model provided an excellent fit to the data, as indicated by a nonsignificant χ^2 ($\chi^2 = 3.4$, with 5 df, $p > .6$), an RMSR $< .01$, and values for the NFI, NNFI, and CFI $> .99$. As shown in Figure 2A, results provided partial support for the hypothesized model. Contrary to prediction, neuroticism and surgency directly predicted both motives, although impulsivity, as expected, did not predict either. Together these factors accounted for 25% of the residual (after controlling for covariates) variance in coping motives, and 8% of the residual variance in enhancement motives. An additional model test in which the paths from neuroticism to coping motives and from neuroticism to enhancement motives were constrained to equality revealed a significant decrement in overall model fit relative to the base (trimmed) model ($\Delta\chi^2 = 52.6$, $p < .001$). Likewise, a model constraining to equality the paths from surgency to coping motives and from surgency to enhancement motives also showed a significant decrement in overall model fit ($\Delta\chi^2 = 17.4$, $p < .001$). Thus, although both personality dimensions predicted both motives, neuroticism was a significantly stronger predictor of coping than enhancement motives, whereas surgency was a significantly stronger predictor of enhancement than coping motives.

Also consistent with the hypothesized model, enhancement and coping motives directly predicted both alcohol outcomes. In addition, impulsivity and surgency directly predicted heavy drinking, and neuroticism directly predicted drinking problems. These findings are consistent with the notion that affect regulation motives do not fully mediate the effects of core personality dimensions on alcohol involvement. Finally, the full model accounted for 38% and 25%, respectively, of the residual variance in heavy drinking and drinking problems.

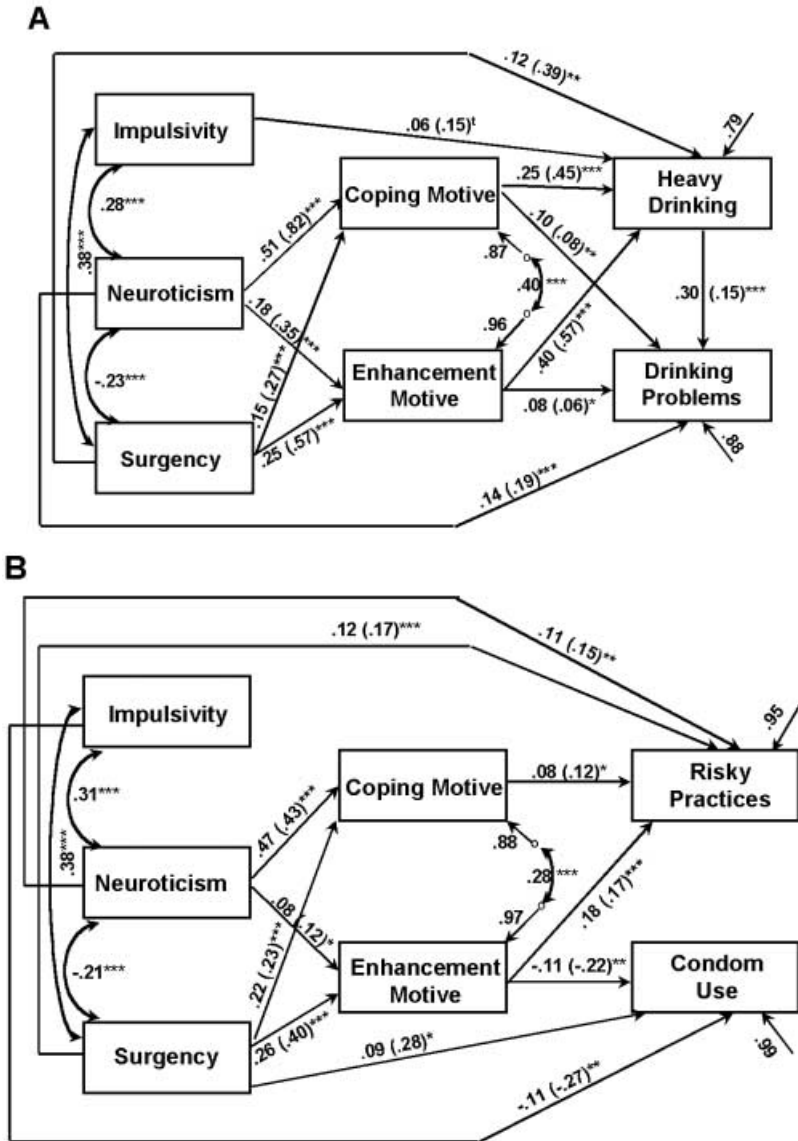


Figure 2
Models depicting main effects of personality and motives on risky behaviors.

Note. All path coefficients are standardized; unstandardized coefficients are in parentheses.

[†]*p* < .10. **p* < .05. ***p* < .01. ****p* < .001.

Personality interactions predicting motives and behavior. To test hypotheses regarding the interactions of neuroticism, surgency, and impulsivity on drinking motives, two equations were estimated in which personality main effects followed by all possible 2- and 3-way interaction terms were entered on sequential steps. Because main effect estimates corrected for unreliability were already presented (Figure 2A), only the interaction results are described here.

As shown in Table 2 (upper panel), we obtained one significant three-way interaction predicting drink to cope. Plotting the interaction (not shown) revealed that neuroticism was less strongly related to coping motives among those who were low in impulsivity and surgency ($b = .38$, $p < .001$) compared to all other combinations of these two variables ($bs > .57$, $ps < .001$). This effect was similar to the predicted neuroticism \times impulsivity interaction, though more complex.

To determine whether these personality dimensions interacted to directly predict either alcohol outcome, we estimated two additional equations predicting heavy drinking and drinking problems. As shown in Table 2 (upper panel), a marginally significant three-way interaction predicting drinking problems was found. Plotting the interaction (not shown) revealed a weak pattern of effects in which the strength of the relationship between neuroticism and drinking problems varied as a function of one's combined standing on surgency and impulsivity. More important, though, neuroticism significantly positively predicted drinking problems across all combinations of impulsivity and surgency examined ($.15 < b < .27$, $ps < .01$).

Mediation of personality effects by motives. To provide a more direct test of mediation by motives, we compared the magnitude of effects of the three personality factors on heavy drinking and drinking problems in a just-identified model that omitted both motives (i.e., the total effects) to one that included both motives (i.e., the direct effects). The difference between the two estimates equals that part of the total personality effect that is mediated by motives (i.e., the indirect effect; see Baron & Kenny, 1986). As shown in Table 3 (top panel), motives fully mediated the effects of neuroticism on heavy drinking, and partially mediated the effects of surgency on heavy drinking and of neuroticism on drinking problems. Supplemental calculations of specific indirect effects (Pedhazur, 1997) showed that, as expected, coping primarily mediated the effects of

Table 2
Summary of Regression Analysis Predicting Motives and Behavior
from Personality Main Effects and Interactions

Variables	Drinking Motives				Alcohol Involvement			
	ΔR^2	Cope β	ΔR^2	Enhance β	ΔR^2	Heavy Drinking β	ΔR^2	Drinking Problems β
Step 1 Covariates and Main Effects	.318***		.286***		.245***		.223***	
Step 2	.002		.001		.000		.002	
Neuroticism × Surgency		.03		-.02		-.00		-.01
Neuroticism × Impulsivity		.03		.03		.01		.04
Surgency × Impulsivity		-.02		.03		.00		.03
Step 3	.002*		.000		.000		.002 ^t	
Neuroticism × Surgency × Impulsivity		-.05*		-.01		-.00		-.04 ^t

Table 2 (cont.)

Variables	Sex Motives				Sexual Risk Taking			
	ΔR^2	Cope β	ΔR^2	Enhance β	ΔR^2	Risky Practices β	ΔR^2	Condom Use β
Step 1	.228***		.124***		.068***		.046***	
Covariates and Main Effects								
Step 2	.005*		.006*		.005 ^t		.001	
Neuroticism × Surgency		.04 ^t		-.06*		-.06*		.01
Neuroticism × Impulsivity		.04		-.01		.02		.02
Surgency × Impulsivity		-.03		.05*		.06*		-.02
Step 3	.001		.000		.001		.001	
Neuroticism × Surgency × Impulsivity		-.04		-.02		-.04		-.03

Note. β is a standardized partial regression coefficient.

^t $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Summary of Direct and Indirect (via Motives) Effects of Personality on Risky Behavior.

	Alcohol Involvement					
	Heavy Drinking			Drinking Problems		
	TE	DE	IE	TE	DE	IE
Impulsivity	.075 ^t	.076*	-.001	.029	.035	-.006
Neuroticism	.171***	-.050	.221	.192***	.137***	.055
Surgency	.257***	.105***	.152	-.011	-.030	.019

	Risky Sexual Behaviors					
	Risky Practices			Condom Use		
	TE	DE	IE	TE	DE	IE
Impulsivity	.003	.005	-.002	-.105*	-.106*	.001
Neuroticism	.184***	.127***	.057	-.004	-.026	.022
Surgency	.197***	.126***	.071	.067	.082 ^t	-.015

Note. TE = Total Effect; DE = Direct Effect; IE = Indirect Effect. All estimates are given in standardized form. All effects were estimated in a just-identified model. For this reason, direct effects in this table do not exactly match direct effect estimates in Figure 1.

^t $p < .10$. * $p < .05$. ** $p < .01$. *** $p < .001$.

neuroticism, whereas enhancement primarily mediated the effects of surgency.

Finally, because similar three-way interactions were obtained for coping motives and drinking problems (Table 2), we reestimated the moderated regression equation predicting problems, controlling for coping motives. In this model, the three-way interaction effect was reduced to nonsignificance ($\beta = -.03$, $p > .20$), indicating that coping motives mediated this interaction effect.

Personality, Motives, and Risky Sexual Behavior

Overall model test. A just-identified model, identical to the alcohol path model, was estimated for risky sexual behavior. In this model, risky practices were treated as causally prior to condom use because the need for condoms (if not condom use itself) is driven by the riskiness of one's sexual behavior. Results of the initial model test revealed five nonsignificant ($p > .15$) paths. These were dropped and a trimmed model was

re-estimated. The trimmed model provided an excellent fit to the data, as indicated by a nonsignificant χ^2 ($\chi^2 = 2.1$, with 5 df, $p > .9$), an RMSR $< .01$, and values for the NFI, NNFI, and CFI $> .99$. As shown in Figure 2B, results of the final analyses provided partial support for the hypothesized model. As before, neuroticism and surgency directly predicted both motives, whereas impulsivity did not predict either. Together these factors accounted for 7% and 22%, respectively, of the residual variance in enhancement and coping motives. An additional model test in which the paths from neuroticism to coping motives and from neuroticism to enhancement motives were constrained to equality revealed a significant decrement in overall model fit relative to the base (i.e., trimmed) model ($\Delta\chi^2 = 40.1$, $p < .001$). Likewise, a model constraining to equality the paths from surgency to coping and from surgency to enhancement also showed a significant decrement in model fit ($\Delta\chi^2 = 10.1$, $p < .01$). Thus, although both personality dimensions predicted both motives, neuroticism was more strongly related to coping than enhancement motives, whereas surgency was more strongly related to enhancement than coping motives, as expected.

Finally, neuroticism, surgency, and both motives directly predicted risky sexual practices, accounting for 10% of the residual variance in this variable. In turn, impulsivity, surgency, and enhancement motives directly predicted condom use, though risky behaviors did not. Finally, these factors together accounted for only 2% of the residual variance in condom use.

Personality interactions predicting motives and behavior. Parallel to the earlier alcohol regression models, two regression equations were estimated to test the interaction effects of neuroticism, surgency, and impulsivity on sex motives. As before, we describe only the interaction results (see Figure 2B for main effect estimates corrected for unreliability). As shown in the bottom panel of Table 2, three two-way interactions were significant. As shown in Figure 3 (panel A), surgency was more strongly related to enhancement motives among high than low impulsive individuals, as expected. In addition, surgency significantly positively predicted enhancement motives among low but not high neurotic individuals (Figure 3B), whereas neuroticism more strongly predicted coping motives among high than low extraverts (Figure 3C).

As before, we estimated two additional equations to determine whether personality factors interacted to directly predict risky sexual

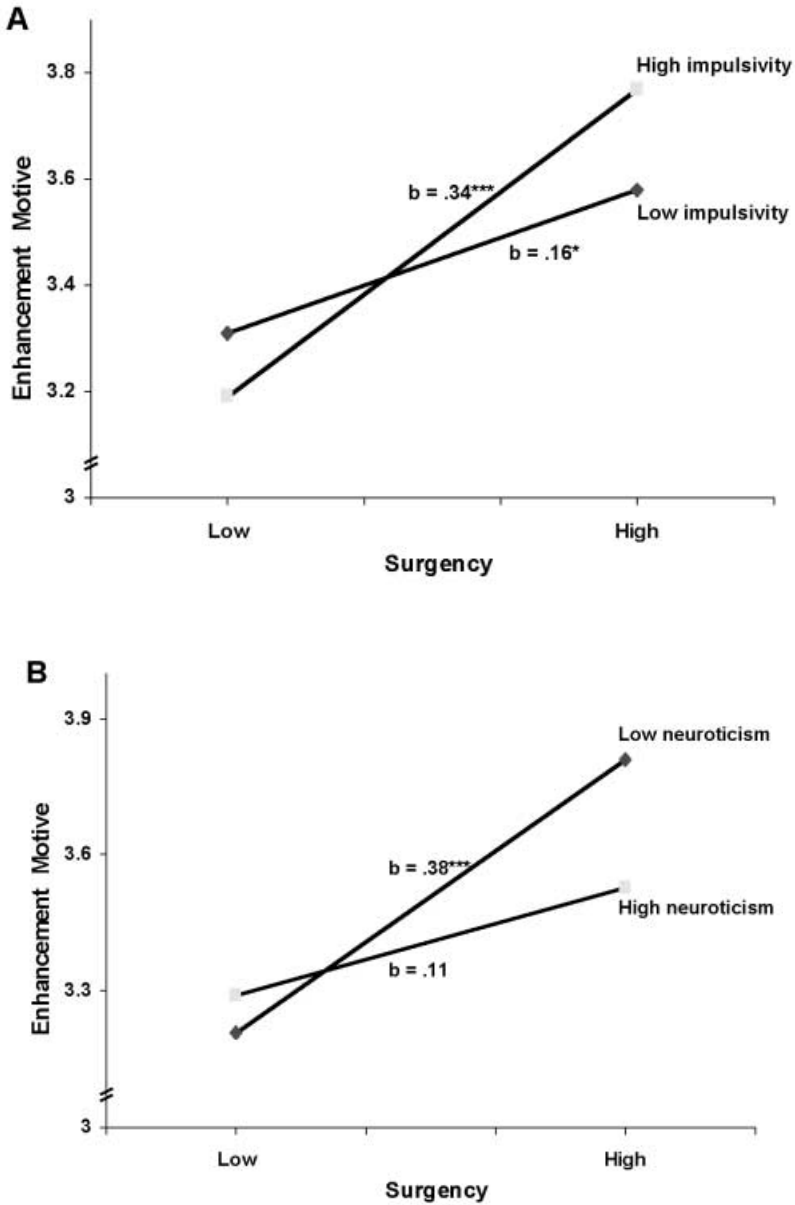


Figure 3

Interactions among personality dimensions predicting motives.

Note. $*p < .05$. $***p < .001$.

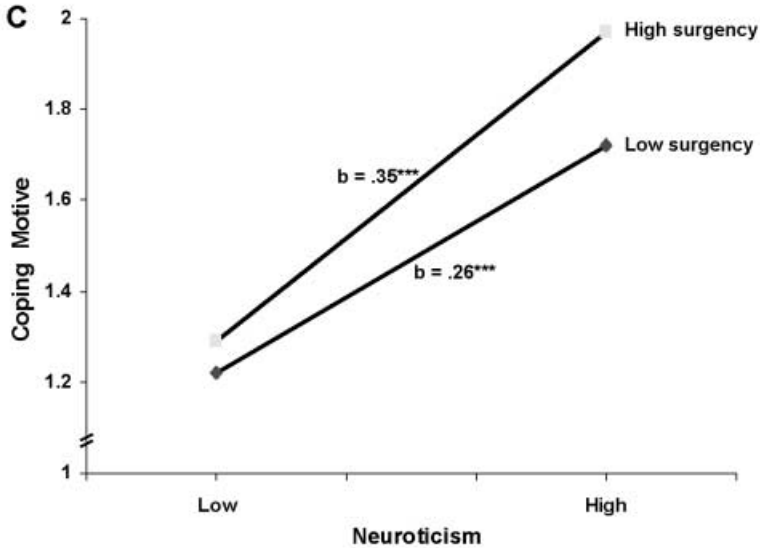


Figure 3 (cont.)

behaviors. As shown in Table 2 (bottom panel), two significant interactions were obtained predicting risky practices. Plotting the interactions (not shown) revealed that both were similar in form to their counterparts predicting enhancement motives. Similar in form to Figure 3A, surgency positively predicted risky practices among high ($b = .29, p < .001$) but not low ($b = .08, ns$) impulsive individuals. Similar in form to Figure 3B, surgency positively predicted risky practices among those who were low ($b = .28, p < .001$) but not high ($b = .07, ns$) in neuroticism. In contrast to Figure 3B, however, the pattern of predicted means showed that those who were low in both surgency and neuroticism reported fewer risky practices (predicted value = .04) than those who were high on either personality trait (predicted values $> .46$).

Mediation of personality effects by motives. To provide a test of mediation by motives, we again estimated the total effects of the three personality factors on the risky sex outcomes in a just-identified model excluding both motives, and the direct effects in a model including both motives. Comparison of the two sets of effects indicated that motives partially mediated the effects of both neuroticism and surgency on risky practices, though they did not mediate the effects of surgency on condom

use (Table 3, bottom panel). As before, calculation of specific indirect effects showed that coping predominantly mediated neuroticism effects, whereas enhancement predominantly mediated surgency effects, on risky practices.

Finally, we added both coping and enhancement motives to the previously described moderated regression equation predicting risky practices to determine whether motives mediated the significant two-way surgency interactions. Despite the presence of surgency interactions predicting both motives, the magnitudes of the interaction coefficients predicting risky practices were relatively unchanged by adding motives to the model ($\beta_s = .050, ps < .10$, for both surgency interactions). Thus, motives did not appear to mediate the higher-order effects on risky behaviors.

DISCUSSION

Personality and Affect Regulation Motives

Results of the present study indicate that personality factors are important predictors of affect regulation motives, accounting for an average of 7% of the variance in enhancement motives and 23% in coping motives across behavioral domains. Although neuroticism and surgency significantly predicted both motives, coping motives were primarily driven by neuroticism and only secondarily by surgency, whereas enhancement motives were primarily driven by surgency and only secondarily by neuroticism, as expected. In contrast, but also as expected, impulsivity did not directly predict motives in either behavioral domain. Thus, the pattern of personality main effects largely conformed to expectation and was remarkably similar across domains.

Results of the interaction tests, however, were more complex and less clear-cut. The three-way interaction predicting coping motives for alcohol use indicated that high neuroticism coupled with high impulsivity or with high surgency predicted greater reliance on alcohol as a way to cope. Similarly, a significant two-way Neuroticism \times Surgency interaction predicting coping motives for sex indicated that extraverted neurotics were also more likely to use sex to cope. Thus, although the predicted two-way Neuroticism \times Impulsivity interaction was not observed in either behavioral domain, impulsivity (in concert with extraversion) did moderate the relationship between neuroticism and drink to cope in a manner consistent with expectation.

Interaction patterns for enhancement motives also conformed only partially to prediction. Although surgency and impulsivity combined in a synergistic fashion to predict the highest overall levels of sex to enhance, as expected, this effect was not replicated for drink to enhance. In addition, surgency interacted with neuroticism such that nonneurotic extraverts reported the highest overall levels of sex to enhance.

Considered together, these findings lend support to the dual notions that neuroticism primarily drives motivated risk taking to regulate negative affect, whereas surgency/extraversion primarily drives the strategic use of risky behaviors to enhance positive affective experiences. Indeed, when surgency did predict coping motives, its effects were conditional on the presence of specific levels of neuroticism (for sex to cope) or on complex combinations of neuroticism and impulsivity (for drink to cope). Likewise, when neuroticism predicted enhancement motives for sex, its effects were contingent upon specific levels of surgency. In short, coping and enhancement motives appear to represent distinct psychological processes primarily rooted in underlying neurotic and extraverted tendencies, respectively.

Finally, although the pattern of findings was highly similar across behavioral domains, it does not appear that we are simply looking at redundant processes across the two models. The fact that parallel motives were only moderately correlated across behavior domains (Table 1) suggests that individuals who use alcohol to cope are not, for the most part, the same individuals who use sex to cope. Likewise the individuals who drink to enhance do not appear to be the same people who use sex to enhance. These observations have important implications for understanding personality effects on behavior, as discussed below.

Personality, Motives, and Their Effects on Risky Behaviors

Results of the present study indicate that motives and personality account for substantial variance in risky behaviors. Our model was more successful, however, in explaining alcohol involvement than risky sex, on average accounting for 32% of the residual variance in alcohol behaviors versus 6% in risky sex outcomes. Although the relative superiority of our model in accounting for alcohol behaviors partly reflects the fact that risky practices were unrelated to condom use whereas heavy drinking strongly predicted problems, the difference in predictive validity remained

even after we removed the variance in problems attributable to drinking (27% vs. 6%). We suspect that this fact reflects differences inherent in the nature of the two behaviors. Unlike alcohol use, sexual behavior necessarily involves two people and occurs in the context of a dyadic relationship. Because of this, explanatory models must incorporate relevant information from both couple members if they are to be adequate. Thus, it is not that personality and motivation lack relevance for understanding risky sexual behavior, but rather that the preferences, needs, and goals of both partners interact in complex ways to produce risky behavior.

Consistent with our hypothesized model, affect regulation motives were important proximal predictors of risky behaviors in both domains, and at least partly mediated personality effects on these behaviors. Not all effects of neuroticism and surgency, however, were mediated by affect regulation motives. These findings were expected, and do not invalidate our model so much as point to its incompleteness. For example, neuroticism both directly and indirectly (via coping motives) predicted risky practices. This suggests that neurotic individuals do in fact use sex to cope, but may also have sex with risky partners for other reasons (e.g., as a way to reassure themselves of their attractiveness or self-worth). Similarly, surgency directly and indirectly (via enhancement motives) predicted risky practices. Thus, extraverted individuals appear to have sex to enhance, but may also have sex as a way to meet their relatively greater affiliative needs. In short, these findings indicate that affect regulation motives are one important avenue by which personality affects risky behaviors, but that other important motivational avenues also exist (see Cooper, 1994; Cooper et al., 1998). Thus, future research mapping the full range of motives for engaging in risky behaviors will be necessary to more fully understand the processes by which personality affects risky behaviors.

The overall pattern of results for impulsivity was highly consistent with our model. As expected, impulsivity directly predicted both heavy drinking and condom use, suggesting that some risky behaviors occur as a more or less direct consequence of poor impulse control. Also as expected, impulsivity was unrelated to affect regulation motives, and instead appeared to activate or amplify dominant response tendencies associated with neuroticism and extraversion/surgency.

Despite the theoretical meaningfulness of these effects, their magnitude was generally small. Although this may be partly accounted for by our use of a narrow measure of impulsivity together with broad-band

measures of other personality dimensions, this fact seems unlikely to provide a complete explanation. Indeed, examination of the correlations in Table 1 shows that impulsivity was generally as strongly related to motives and behaviors at the bivariate level as were neuroticism and surgency. Thus, only in the multivariate case were the effects of impulsivity attenuated, suggesting that overlap between impulsivity and motives and behaviors at least partly reflects spurious influence from neuroticism and surgency. Accordingly, failure to control for these factors in future research may overestimate the etiologic role of impulsivity in risk-taking.

Implications, Caveats, and Conclusions

Results of the present study hold a number of potentially important implications for understanding how personality influences risky behaviors. First, our data indicate that these influences are myriad and complex. We found, for example, that extraversion was positively linked to both risky sexual practices and condom use, suggesting that being extraverted endows one with the disposition and skills (e.g., outgoing, assertive) needed to create opportunities that lead to risky sexual liaisons, as well as to negotiate or insist upon condom use. Our data further suggests that the adaptivity of a given personality trait may depend on the presence or absence of other personality traits (cf. Widiger & Costa, 1994). For example, extraverts engaged in higher overall levels of risky sex practices, but primarily only if they also lacked adequate impulse control.

Further complexities are suggested by the fact that personality traits do not appear to bear a one-to-one relationship to specific risky behaviors. Rather, it appears that personality affects behavior by arousing specific needs or goal states which, in turn, may be satisfied *in any of several ways* (cf. Tesser, Martin, & Cornell, 1996). For example, neurotic individuals appear more likely to adopt the goal of reducing dysphoric mood. Once adopted, this goal arouses a consummatory state that can be satisfied, in the present case, either by drinking or having sex. The fact that the intervening mechanisms in this hypothetical causal chain (i.e., goal adoption and the associated consummatory state) do not bear a lock-step relationship to behavior suggests that links between personality traits and any given behavior may be elusive. However, by attempting to understand what the person is trying to do or to accomplish, by focusing on the goal of the activity and conceptualizing behavior as a way to achieve that goal,

we believe that the regularities between personality traits and behavior can be revealed (Snyder & Cantor, 1997). Toward this end, delineating the multiple needs that risky behaviors can serve, and developing and testing models that link personality dispositions to risky behaviors via these motives, are critical next steps.

Of course, some of the complexity in our data may result from our use of broad-band measures of extraversion and neuroticism. Personality traits, when conceptualized and measured at higher levels of abstraction, contain a number of allied but distinct component traits or facets. Because facets of a broad-band trait may exert unique influences, reliance on broad-band measures necessarily introduces ambiguity into the interpretation of results. For example, in our earlier example, the more narrowly defined facets of thrill and adventure seeking may have accounted for the extraversion effect on risky practices, whereas the assertiveness facet may have accounted for the effect on condom use. Although supplementary analyses did not support this interpretation (see Note 2), the important point for the present discussion is that use of broad-band measures, while more fully representing the construct of interest and offering parsimony, typically complicates interpretation of observed personality effects. Thus, the challenge to personality researchers is to identify that level of abstraction which, for their specific research question, represents the best compromise between inclusiveness and parsimony on the one hand (i.e., bandwidth), and informativeness and accuracy on the other (i.e., fidelity; see John, Hampson, & Goldberg, 1991).

Several limitations of the present study must be acknowledged. First, although our model assumes that people expect to obtain positive affective outcomes from engaging in specific risky practices, we did not directly assess these expectancies. Indeed, we know from past research that individual differences in expectancies for alcohol's mood altering properties systematically moderate the effects of traits related to extraversion and neuroticism on coping and enhancement motives for alcohol use (Cooper, Frone, Russell, & Mudar, 1995). Thus, inclusion of relevant expectancies should enable more precise delineation of the conditions under which specific personality traits promote risky behaviors. The lack of a multi-dimensional, psychometrically sound measure to assess expectancies for engaging in sexual behavior is a significant barrier, though recent work on expectancies for risk-taking behaviors (Fromme, Katz, & Rivet, 1997) may provide a useful starting point for the development of such a measure.

Second, although controlling for prior involvement in risky behaviors helped to rule out the possibility that earlier risk taking caused individuals' standings on subsequent personality, motive, and behavior measures, the cross-sectional nature of our study precluded unambiguous ordering of personality, motives, and behavior in our model. Because mediation assumes a strict causal order among the hypothesized antecedent, mediator, and outcome (Baron & Kenny, 1986), future studies should include at least three waves of measurement so that clear temporal order among these variables can be established.

Finally, these data highlight the limitations of overly general models of risk taking. Although each of the behaviors we examined clearly entails risk of negative outcomes, and each exhibited common correlates both across and within domains, these behaviors nevertheless do not form a psychologically homogeneous category of behaviors. Not only were correlations between behaviors both across and within domains modest (see Table 1), but each behavior also had unique correlates. Thus, although general models such as ours are useful for highlighting commonalities, they cannot provide a fully adequate explanation of any given risk behavior. As Catania and colleagues have argued (Catania, Kegeles, & Coates, 1990), each behavior has its own set of dynamics or factors that encourage its continuation and that create pressures for its discontinuation. Ultimately, therefore, adequate explanatory models must encompass both the common *and* unique causes of individual risky behaviors.

These limitations notwithstanding, the present study provides strong support for the importance of affect regulatory processes in accounting for risky behaviors. Indeed, extraversion and neuroticism appear to influence risky behaviors primarily indirectly, by shaping the nature and quality of emotional experience as well as characteristic styles of coping with these emotions. Although we view this as a highly general model of the psychological processes that give rise to risky behaviors, we do not view it as a complete one. Not only do skill, ability, and cognitive factors influence risky behaviors, but other motivations as well. Nevertheless, results of the present study suggests that efforts to regulate the intensity and quality of emotional experience constitute important, perhaps critical, pathways to risk-taking and risky behaviors.

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