

Risk Taking and Personality

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Comparisons were made of the personality and social orientations of antisocial risk takers, defined as residents in a long-term drug-treatment facility ($N = 24$); adventurous risk takers, defined as rock climbers ($N = 18$); and prosocial risk takers, or heroes, defined as policemen and firemen decorated for bravery ($N = 21$). Measures included substance abuse proclivity, emotional arousability, conformity, moral reasoning, empathy, psychopathy, and sensation seeking. Discriminant analysis identified two functions that correctly classified 98.18% of the sample. Drug-unit residents had high scores on an Antisocial function, characterized by emotionality, depression, psychopathy, substance abuse proclivity, and lower scores on moral reasoning. Rock climbers had high scores on an Antistructural function, characterized by sensation seeking and moral reasoning, the latter reflecting the higher education level of the rock climbers. Neither discriminant function characterized the heroes. Thus, drug-unit residents, rock climbers, and heroes appear to represent both different psychological types and different forms of risk taking.

There is a tension in the theory of personality and behavior between the desire to create simple, reductionistic, and easily testable models of personality-behavior relations and the competing recognition that any behavior is subject to a number of influences. Nowhere is this more evident than in the study of personality and risk taking. For purposes of this article, risk taking is defined as any purposive activity that entails novelty or danger sufficient to create anxiety in most people. Risk taking can be either physical or social, or a combination of the two.

Reductionistic Model of Risk Taking

The reductionist model of risk taking, and the related construct of sensation seeking, seeks to identify an underlying cause of risk taking. The behavior of persons who persistently search for highly stimulating experiences has been attributed to low arousability, variously described as low cortical or autonomic responsiveness, or, more specifically, a low level of activation of a behavioral inhibition system, experienced as a relatively low level of anticipatory anxiety (Fowles, 1980; Gray, 1982; Hare, 1965, 1978; Quay, 1965; Zuckerman, 1979, 1983).

By engaging in risky behavior, risk takers seek to increase

their unusually low arousal to an optimum level. Presumably, their low baseline arousal levels cause them to be relatively fearless. To reach an optimal, pleasurable arousal level, such persons seek stimulation that would seem sufficiently novel or dangerous to the ordinary person to produce unpleasant anxiety. Because it minimizes the aversiveness of anticipated punishment (passive avoidance), this predisposition is thought to be associated with low socialization and nonconformity, which some appear to assume to be equivalent to an antisocial posture (Hare, 1978; Lindner, 1944; Trasler, 1978). Such low arousability is thought to be shared by antisocial thrill-seekers, including psychopaths and delinquents, as well as by adventurers, participants in dangerous sports, and heroes (Farley, 1976a, 1976b; Lykken, 1957, 1982; McCord, 1982).

Howard (1986) criticized theories of psychopathy (and, by implication, risk taking) that are based on low arousability and lack of fear (see also Blackburn, 1978). Howard pointed out both inconsistencies in the physiological data and that arousability deficits do not discriminate psychopaths from schizophrenics.

Furthermore, most studies that assess arousal or sensation-seeking variables tend to be restricted to specialized populations, heavily overrepresented by prison, reform school, or drug-unit populations, and tend not to compare distinct groups of risk takers. Studies that do compare a group of risk takers with "normals" are essentially comparing a specialized population with a general one and ignore the fact that very different levels and types of risk taking may be obscured in the "normal" population. A better test of the domain of relevance of such variables would be to examine them in different samples of known risk takers.

Cognitive-Social Learning Theory Models

Both Blackburn (1978, 1984) and Sarason (1978) presented cognitive-social learning theory models of psychopathy and

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antisocial behavior. In testing the arousal hypothesis of psychopathy, Blackburn (1978) found that psychopaths actually showed greater cortical arousal to noxious stimulation, which he interpreted to reflect a more rapid rate of processing environmental input. "[Psychopaths] may therefore seek out stimulating events not to increase arousal, but to maintain a high optimal level of information flow" (p. 163). This interpretation thus suggests a more cognitive approach to psychopathy.

Later, Blackburn (1984) suggested that psychopaths have a common cognitive bias toward perceiving hostile intent from others. Sarason (1978) also noted that antisocial juvenile delinquents expect hostility from others, but he focused more on social determinants of such behavior, including exposure to antisocial role models, lack of support for social achievement, and peer pressure for antisocial behavior. This bias in social perception may predispose such people to be nonempathic and also may serve to retard moral development (cf. Hogan, 1973).

A cognitive-social learning theory of risk-taking behavior suggests that social factors, perhaps in combination with personality predispositions, have more influence on various forms of risk-taking behavior than underlying physiological traits. Furthermore, people have very different reasons for risk taking. For example, Csikszentmihalyi (1977) observed that rock climbers engaged in this activity not so much for the danger and risk per se, but for the experience of "flow"—intense concentration that promotes feelings of competence and control.

The present study compares the personality characteristics and social orientations of three different types of risk-taking individuals: drug-unit residents (antisocial risk takers), heroes (prosocial risk takers), and highly skilled rock climbers (adventurous risk takers). If the reductionist model of risk taking is correct, all three groups should be similar, reporting high levels of sensation seeking, low levels of arousability (operationalized as emotionality), and relatively antisocial orientations. However, it is expected that these groups of risk takers will differ on these dimensions. For example, it is hypothesized that antisocial risk takers will score higher on some types of sensation seeking (e.g., disinhibition and boredom susceptibility) and substance abuse proclivity and lower on measures of moral development and empathy than the other two groups. If the groups do differ on these dimensions, their risk taking cannot easily be attributed to an underlying personality trait.

Method

Sample and Procedure

The antisocial risk takers consisted of 24 male residents in a long-term drug-treatment facility, a majority of whom had been referred by the legal system for major or serial felonies other than dealing or possessing illegal substances. The specific crimes involved were confidential in this treatment program. Nonetheless, this population was characterized by men who had committed crimes ranging from incest, infanticide, and murder for hire to lesser crimes such as theft, burglary, and armed robbery. These respondents were group administered the test instrument.

The prosocial risk takers, or heroes, were from two different urban centers and consisted of 21 policemen and firemen who had recently been commended for bravery in the line of duty. Again, all respondents

were men. Questionnaires were distributed by department representatives for reasons of confidentiality.

Skilled rock climbers ($n = 18$) were contacted through a snowball technique. Four experts identified male rock climbers whom they certified as having a skill rating of 5.10 or better. (Rock climbers rate the difficulty of climbs completed from 5.0 for the least difficult to 5.14 for the most difficult.) These skilled rock climbers were also asked to identify others of their own or better skill levels to participate.

Drug-unit residents were comparable in age ($M = 34$, $SD = 7.15$) to the heroes ($M = 37$, $SD = 8.34$), and both of these groups were somewhat older than the rock climbers ($M = 28$, $SD = 4.17$). All groups ranged in education from "some high school" to "postgraduate." However, rock climbers were the most highly educated group (mode = "postgraduate"), followed by heroes (mode = "some college"), then drug-unit residents (mode = "completed high school"). There were also ethnic differences between the groups, $\chi^2(2, N = 61) = 8.63$, $p = .01$. The rock climbers were exclusively White, whereas 4 (19%) of the heroes and 9 (24%) of the drug-unit residents were non-White. These differences, however, should be viewed with caution given the small cell sizes.

The sample sizes, though small, are comparable to those in other studies of antisocial personality (e.g., Brown & Gutsch, 1985; Gorenstein, 1982; Hare, 1984; Sutker & Allain, 1987).

Measures

The study used eight different scales assessing personality and social orientation. Personality measures included sensation seeking, substance abuse proclivity, emotionality, and depression. Measures of social orientation included psychopathy, independence/conformity, empathy, and moral development. Internal reliabilities were assessed using either Cronbach's alpha for measures with scaled items or Kuder-Richardson's Formula 20 (KR-20) for measures with dichotomous items. Internal reliabilities for the moral development scales are not applicable given the scoring procedures (see below).

Sensation seeking. Form IV of Zuckerman's (1979) Sensation-Seeking Scale is composed of 72 forced-choice items and yields five subscales: General Sensation Seeking, Thrill and Adventure Seeking, Experience Seeking, Disinhibition, and Boredom Susceptibility. This widely used scale allows for the discrimination of different response patterns within the overarching concept of sensation seeking and is considered the standard means of assessing this trait. These subscales assess different dimensions of predisposition to risk. For example, Thrill and Adventure Seeking appears to assess the inclination to seek situations that entail physical risks, whereas Disinhibition is oriented toward interpersonal risk taking. KR-20 coefficients for these scales are .76, .84, .81, .66, and .61, respectively.

Substance abuse proclivity (SAP; KR-20 = .81). The SAP is a Minnesota Multiphasic Personality Inventory (MMPI) subscale derived from the examination of item response frequencies (MacAndrew, 1986). The scale distinguishes substance abusers in treatment from non-substance-abusing comparison groups at detection rates ranging from 83.5% to 90.3%. However, rather than seeing it as a simple substance abuse scale, MacAndrew interpreted this scale as tapping extraverted reward seeking. Form A, which consists of 36 items, none of which pertains directly to substance abuse and its effects, was used to ensure that personality traits rather than substance abuse per se were being assessed.

Emotionality and depression. These scales each consist of nine MMPI items that distinguish both alcoholics and non-substance-abusing psychiatric outpatients from normal samples (MacAndrew, 1981). Together, these scales are thought to form an index of Eysenck's dimension of emotionality (Eysenck & Eysenck, 1978), which Eysenck

(1977) interpreted as a measure of emotional arousability. KR-20 coefficients for Emotionality and Depression were .86 and .86, respectively.

Psychopathy (KR-20 = .71). This scale consists of 13 dichotomous items based on Cleckley's (1976) clinical criteria for psychopathy which I recast in the form of self-referential or opinion statements reflecting an antisocial posture (see Appendix). I attempted to remove the negative connotations of the original criteria so that the items would suggest to antisocial persons that antisocial traits were not necessarily undesirable.

Independence/conformity. The Independence/Conformity subscale from Scott's (1965) Values Inventory was included to assess nonconformity. It consists of 20 items rated on a scale from 1 to 3 indicating whether or not the respondent admired certain characteristics (1 = *always admire*, 2 = *depends on the situation*, and 3 = *something you always dislike*). It was scaled so that higher scores indicated a greater admiration of nonconformity. Scott's scoring scheme recommended reducing each item to a dichotomous scale, with 2 and 3 being recoded to 0. However, the dichotomous scoring resulted in an unacceptably low internal reliability coefficient (KR-20 = .41), so trichotomous scoring was retained to enhance internal reliability ($\alpha = .72$).

Empathy ($\alpha = .61$). The 12-item short form of the Fantasy-Empathy Scale (Stotland, Matthews, Sherman, Hansson, & Richardson, 1978) was used to measure empathy. These items assess individuals' orientations to the feelings of other people. The items are scaled from 1 (*strongly agree*) to 5 (*strongly disagree*). Items were scored so that higher scores indicated greater empathy.

Moral development. The Defining Issues Test (DIT; Rest, 1979) was used to assess level of moral development. The test consists of six stories presenting moral dilemmas and a series of 12 statements about each story reflecting possible moral considerations representing the differing levels of moral reasoning described by Kohlberg (1984). These statements are rated on a scale from 1 (*not at all important*) to 5 (*extremely important*). In addition, respondents were asked to indicate four of these considerations that they thought were the most important in order of importance. The DIT yields three scores. The P% score reflects the proportion of principled moral items that are chosen as important for the six stories, and the D score is derived from a complex algorithm based on the ratings of the 72 items. Each item is rated in comparison with the ratings of a normed sample. To control for the respondent's simply selecting the most complex-sounding alternatives, the DIT contains statements that are complex but meaningless in the context of the story. The M scale counts the number of times a respondent selects meaningless statements, and scores of 8 or more indicate invalid DIT scores. On the basis of the M scale, 4 individuals (2 drug-unit residents, 1 hero, and 1 rock climber) were found to have invalid DIT scores and were eliminated from subsequent analyses.

Norms. Table 1 presents the means and standard deviations of the scales used in this study for each of the three groups: drug-unit residents, rock climbers, and heroes. In addition, overall means and standard deviations for the whole sample are provided and, where available, published norms.

A number of caveats should be observed in interpreting Table 1. Most of the "norms" are based on college student populations and thus may be inapplicable to more general adult samples. The DIT P% score norms were available on adult samples, but the DIT D score sample presented by Rest (1979) was a composite of several samples ranging from junior high school students to older adults, with the former comprising 23% of the sample. The scores of the junior high school students were much lower than those of the other samples and thus lowered the average scores. Unfortunately, D scores for the adult sample were not presented. Finally, norms for some of the scales were not available.

Nonetheless, a few interesting points can be noted. The scores for the rock climbers on the SAP scale were similar to those of the normed samples, whereas the heroes' scores were somewhat higher and the

drug-unit residents' scores were markedly elevated in comparison with norms. Scores on Emotionality and Depression for rock climbers and heroes were similar to the norms, whereas scores for the drug-unit residents were much higher. On the sensation-seeking subscales, the heroes scored uniformly lower than the norms on all of the scales. Rock climbers were higher on General Sensation Seeking, Thrill and Adventure Seeking, and Experience Seeking, and drug-unit residents were high on Disinhibition and Boredom Susceptibility. Rock climbers were higher and heroes and drug-unit residents lower than the norms on the DIT P% scores. Finally, the D score from the DIT was elevated for all three groups in comparison to the norms, undoubtedly because the latter sample included a substantial number of younger respondents.

Results

Table 2 presents the correlations among all scales in the study. Of the 78 correlations, 38 (49%) were significant. Moreover, there appear to be two clusters of intercorrelations. Although all of the sensation-seeking subscales were intercorrelated (in varying degrees), they tended to relate differently to the other subscales in the study. Disinhibition correlated significantly with scales reflecting a pleasure-seeking, relatively antisocial orientation (i.e., SAP, Psychopathy). These, in turn, were highly correlated with the measures of emotional arousability (i.e., Emotionality and Depression). General Sensation Seeking, Thrill and Adventure Seeking, and Experience Seeking were uncorrelated with those scales reflecting pleasure seeking, an antisocial posture, and emotional arousability. The latter measures were also uncorrelated with Independence/Conformity, which was modestly associated with Thrill and Adventure Seeking and Boredom Susceptibility. Empathy and moral development scores tended to be negatively correlated with SAP, Emotionality, Depression, and Psychopathy.

Bivariate Group Differences

Preliminary group differences were tested for all scales and subscales using one-way analyses of variance (ANOVAs) with Bonferroni's correction for multiple tests. That is, .05 was divided by 13, the number of tests run, to determine the p level (.004) that would be considered significant. Where significant differences were found, Scheffé's post hoc range tests ($p < .01$) were used to determine which groups were significantly different. Because cell means were presented in Table 2, Table 3 presents only the F statistics and the results of the Scheffé post hoc range tests.

Of the 13 tests conducted, 10 were significant and 1 approached significance. The groups did not differ on Independence/Conformity and the DIT D score, and differences in Empathy scores only approached significance ($p = .006$). Inspection of the Scheffé post hoc range tests revealed that drug-unit residents were significantly higher than both the rock climbers and the heroes on the SAP scale, Emotionality, Depression, Psychopathy, and the Disinhibition subscale of the Sensation-Seeking Scale. They were also higher on Boredom Susceptibility, although this only reached significance in comparison to the heroes. The heroes were significantly lower than the other two groups on General Sensation Seeking and Experience Seeking. Rock climbers were higher than heroes on Thrill and

Table 1
Comparison of Sample Means With Norms for Scales

Scale	Drug-unit residents		Rock climbers		Heroes		Whole sample		Norms	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
SAP (Form A)	21.33	3.46	10.67	3.85	13.10	3.29	15.58	5.96	10.68	— ^a
Emotionality	6.33	2.39	1.71	1.21	2.50	1.91	3.79	2.85	2.34	— ^b
Depression	6.21	1.64	1.78	1.96	1.33	2.06	3.32	2.95	1.49	— ^b
Psychopathy	8.33	2.67	6.06	1.87	5.15	1.63	5.48	2.60	—	—
Independence/ Conformity	47.25	4.76	46.50	3.87	46.00	4.99	46.62	4.56	—	—
Empathy	36.88	6.02	41.67	6.47	42.90	6.48	40.21	6.77	—	—
General Sensation Seeking	13.42	3.67	15.33	2.22	9.50	3.66	12.71	4.03	13.40	3.60 ^c
Thrill and Adventure Seeking	10.00	2.70	12.22	2.37	8.52	3.87	10.14	3.35	11.10	2.60 ^c
Experience Seeking	10.71	3.45	11.72	3.04	6.20	2.82	9.55	3.89	9.60	3.90 ^c
Disinhibition	8.29	2.68	5.33	2.30	5.22	2.16	6.48	2.81	6.70	3.30 ^c
Boredom Susceptibility	9.00	2.61	7.61	2.73	5.33	2.48	7.36	3.00	7.90	3.10 ^c
DIT P% score	32.39	13.05	50.16	17.82	33.42	12.40	37.85	16.19	40.00	16.70 ^d
DIT D score	32.58	7.09	38.11	6.99	34.99	6.75	34.99	7.19	20.88	10.00 ^e

Note. SAP = Substance Abuse Proclivity; DIT = Defining Issues Test.

^a Minnesota college students, *N* = 3,278 (MacAndrew, 1986). ^b Minnesota college students, *N* = 3,278 (MacAndrew, 1981). ^c Delaware introductory psychology students, *N* = 686 (Zuckerman, 1979). ^d DIT adult normative sample, *N* = 1,149 (Rest, 1979). ^e DIT normative sample (Rest, 1979).

Adventure Seeking. They were also higher than the other two groups on the DIT P% score.

The Scheffé test did not reveal group differences on Empathy. However, the less conservative Student-Newman-Keuls post hoc range test ($p < .05$) suggested that the drug-unit residents were significantly lower on Empathy than the other two groups.

The possibility exists of a confound between differences in risk taking and education. Thus, data were reanalyzed, controlling for education. Eight of the 11 between-group differences remained significant. However, the significance of the difference on the DIT P% score and the trend on the D score was eliminated. This reanalysis also reduced the difference on Boredom Susceptibility to a trend ($p = .022$; Bonferroni's cor-

Table 2
Interscale Correlation Matrix

Scale	1	2	3	4	5	6	7	8	9	10	11	12	13
1. SAP (Form A)	—	.70***	.66***	.56***	.11	-.29*	-.01	-.08	.15	.48***	.23	-.31**	-.33**
2. Emotionality		—	.72***	.54***	.13	-.25*	-.04	-.10	.13	.46***	.37**	-.33**	-.36**
3. Depression			—	.53***	.10	-.37**	.02	-.16	.19	.45***	.42***	-.15	-.26*
4. Psychopathy				—	.06	-.37**	.14	.10	.14	.50***	.36**	-.28*	-.06
5. Independence/ Conformity					—	-.07	.23	.27*	.22	.14	.26*	.02	-.02
6. Empathy						—	-.16	-.02	-.13	-.35**	-.24	.08	-.19
7. General Sensation Seeking							—	.79***	.80***	.40***	.59***	.23	-.05
8. Thrill and Adventure Seeking								—	.55***	.30*	.27*	.31*	.11
9. Experience Seeking									—	.29*	.63***	.19	-.18
10. Disinhibition										—	.46***	-.16	-.12
11. Boredom Susceptibility											—	-.07	-.16
12. DIT P% score												—	.55***
13. DIT D score													—

Note. *N* = 63. SAP = Substance Abuse Proclivity; DIT = Defining Issues Test.

* $p \leq .05$. ** $p \leq .01$. *** $p \leq .001$.

Table 3
F Tests and Post Hoc Range Comparisons

Scale	<i>F</i>	<i>p</i> ^a	Scheffé ^b (<i>p</i> < .01)
SAP (Form A)	54.40	.000	1 > (2, 3)
Emotionality	33.99	.000	1 > (2, 3)
Depression	46.18	.000	1 > (2, 3)
Psychopathy	12.74	.000	1 > (2, 3)
Independence/Conformity	0.42	.658	—
Empathy	5.66	.006	—
General Sensation Seeking	15.55	.000	3 < (1, 2)
Thrill and Adventure Seeking	7.11	.002	2 > (3)
Experience Seeking	17.32	.000	3 < (1, 2)
Disinhibition	11.17	.000	1 > (2, 3)
Boredom Susceptibility	11.04	.000	1 > (3)
DIT P% score	8.77	.001	2 > (1, 3)
DIT D score	3.03	.056	—

Note. SAP = Substance Abuse Proclivity; DIT = Defining Issues Test.
^a Bonferroni's correction for multiple *F*s was used. Therefore only those *p*s < .004 are considered significant. ^b Group 1 = drug-unit residents, Group 2 = rock climbers, Group 3 = heroes.

rection for multiple *F*s required a significance level of *p* < .004). Note, however, that none of the group differences in personality or antisocial behavior were affected by controlling for education.

Multivariate Group Differences

Discriminant analysis minimizing residuals was used to test the efficiency of the entire battery of scales in correctly classifying the members of the three populations over random probability. Eight individuals were omitted from this analysis: 4 because of invalid DIT scores and 4 because of missing information on one or more variables. Three drug-unit residents, 1 rock climber, and 4 heroes were eliminated, resulting in sample sizes of 21, 17, and 17, respectively. Thus, the prior probabilities for the three groups were .38, .31, and .31, reflecting the random probability of classifying individuals correctly. For the discriminant analysis to be significant, the canonical discriminant functions, reflecting the groupings of the variables that maximize the differences between the groups, must correctly classify individuals better than the chance probabilities.

Two discriminant functions, presented in Table 4, were identified. The first function had an eigenvalue of 3.53, accounted for 71.21% of the variance and had a canonical correlation of .88, Wilks's $\lambda = .01$, $\chi^2(16, N = 55) = 116.28$, *p* < .001. The second function had an eigenvalue of 1.43, accounted for the remaining 28.79% of the variance, and had a canonical correlation of .77, Wilks's $\lambda = .41$, $\chi^2(7, N = 55) = 43.01$, *p* < .001.

The function structure matrix presented in Table 4 ranks each scale and subscale according to the strength of its contribution to the overall classification. The first function is best defined by the positive loadings by the SAP scale, followed by Depression, Emotionality, Psychopathy, and Disinhibition, and by the negative loadings by the DIT D score and Empathy. The second function is best defined by positive loadings by Experience Seeking, General Sensation Seeking, Thrill and Adventure Seeking, the DIT P% score, and Boredom Susceptibility and by

negative loadings by Independence/Conformity. Note that the loadings by Empathy and Independence/Conformity were weak (−.14 and −.17, respectively). For reasons to be discussed later, I have chosen to call the first function Antisocial and the second function Antistructural.

Together, as indicated in Table 5, these two functions correctly classified 98.18% of group members, including 100% of the drug-unit residents, 100% of the rock climbers, and 94.1% of the heroes (1 of the heroes was incorrectly classified as a drug-unit resident). This represents an improvement of approximately 60% over the prior probabilities.

The group centroids, or means on the discriminant functions, are plotted in Figure 1. The *Y* axis represents standardized scores on the first function, and the *X* axis represents standardized scores on the second function. As can be seen, the three groups are quite distinct, each appearing in a different quadrant of the two-space. The drug-unit residents were high on the Antisocial dimension (Function 1), scoring almost three standard deviations above the mean, and near the mean on the Antistructural dimension (Function 2). Conversely, the rock climbers were high on the Antistructural dimension, scoring about one standard deviation above the mean, and low on the Antisocial dimension, scoring two standard deviations below the mean. The heroes were approximately one standard deviation below the mean on both functions.

Discussion

This study identified three groups of individuals whose risk taking manifested itself in very different forms. Drug-unit residents were thought to represent reward-seeking, relatively antisocial risk taking, not because of their drug use per se, but because of their overall life-style. Rock climbers represented adventurous risk takers whose risky behavior was premeditated and based on the acquisition of relatively rare skills. Heroes (policemen and firemen decorated for bravery) represented prosocial risk taking, which took place in the context of performing their routine duties.

The groups differed on a number of measures of personality

Table 4
Results of Discriminant Analysis

Function structure matrix	Function 1: Antisocial	Function 2: Antistructural
SAP (Form A)	.74	−.12
Depression	.64	.22
Emotionality	.49	.08
Psychopathy	.41	.17
Disinhibition	.34	.08
DIT D score	−.25	.01
Empathy	−.14	−.09
Experience Seeking	.10	.61
General Sensation Seeking	.02	.57
Thrill and Adventure Seeking	.04	.44
DIT P% score	−.21	.40
Boredom Susceptibility	.22	.28
Independence/Conformity	.08	−.17

Note. SAP = Substance Abuse Proclivity; DIT = Defining Issues Test.

Table 5
Classification Results of Discriminant Analysis

Actual group	No. of cases	Predicted group membership					
		1		2		3	
		M	%	M	%	M	%
Drug-unit residents	22	21	100.0	0	0.0	0	0.0
Rock climbers	17	0	0.0	17	100.0	0	0.0
Heroes	17	1	5.9	0	0.0	16	94.1

Note. Percentage of grouped cases correctly classified = 98.18%. Group 1 = drug-unit residents, Group 2 = rock climbers, Group 3 = heroes.

and social orientation. The drug-unit residents had higher scores than the other two groups on measures reflecting psychopathology and an antisocial posture, including substance abuse proclivity, emotionality, depression, psychopathy, disinhibition, and boredom susceptibility, and had lower scores on empathy. The rock climbers were higher than the heroes on thrill and adventure seeking and experience seeking. The groups did not differ on independence/conformity or on the DIT D score of the moral reasoning scale.

Although the rock climbers were higher than the other groups on principled moral reasoning (DIT P%), this effect disappeared when controlling for education level. This reflects the extent to which the Kohlberg-Rest method of assessing moral development depends on education. It should be noted that this does not mean that moral development is simply an analog of educational achievement. Rather, new means of assessing moral development need to be developed (Gilligan, 1982).

It is interesting that the heroes were distinct from the other

two groups primarily in their low scores on the sensation-seeking scales, which suggests that their motives for risk taking were not based on thrill seeking.

The group differences were most clearly indicated in the discriminant analysis, which produced two distinct discriminant functions correctly classifying over 98% of the respondents. Measures reflecting pleasure seeking, interpersonal risk taking (Disinhibition), an antisocial posture, and emotional arousability loaded strongly and positively on the first function, which was therefore termed Antisocial. Measures reflecting adventurous experience seeking loaded strongly and positively on the second function. Although DIT P% also loaded strongly on the second function, this almost certainly reflected the educational attainment of the rock climbers.

The second function was termed Antistructural, a term adopted from Csikszentmihalyi's (1977) characterization of the motives of rock climbers. Antistructural connotes a tendency to regard conventional norms as provisional not because of an antisocial posture but because of experience seeking or developmental aspirations toward self-actualization. Many rock climbers speak of their experiences in terms similar to those used to describe meditative states or peak experiences (Csikszentmihalyi, 1977; Maslow, 1971).

Characterizing these functions as a two-space, each group occupied a different quadrant. These quadrants clearly reflected different personality traits and social orientations, with drug-unit residents high on Antisocial and low on Antistructural dimensions, rock climbers showing the opposite pattern, and heroes low on both dimensions.

A number of caveats in interpreting these data need to be mentioned. The sample did not include women, which limits the study's generalizability. It also did not include a control group of non-risk-takers, and it is possible that the exclusion of controls served to magnify differences between the groups of risk takers. However, the fact that the heroes tended to score at or below normative levels on most of the scales for which norms were available suggests that the absence of a non-risk-taking control group was not of major importance.

Furthermore, this study did not directly assess physiological arousability, but instead used a proxy measure, emotionality. Eysenck (1977) defined emotionality as strong, easily aroused emotions. It is a reasonable inference that emotional arousabil-

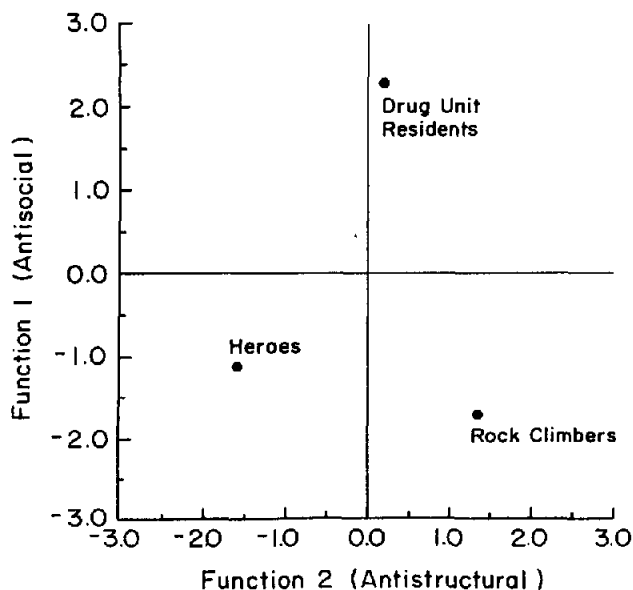


Figure 1. Group centroids from discriminant analysis.

ity, now treated as interchangeable with neuroticism (Carson, 1989), would, in some measure, reflect physiological arousability. Nonetheless, the study cannot definitely rule out the possibility that a tendency toward low arousability did not characterize all three groups.

However, there are clearly differences between these groups. This study identified only two dimensions on which these groups differed, and it is likely that there are others. The fact that the heroes, although they literally risked their lives in the performance of their duties, were not characterized by either dimension, suggests that the reasons for prosocial risk taking may be very different from those for risk or sensation seeking. Although heroes may be ordinary people in extraordinary circumstances, they also may be motivated for reasons other than those that were assessed in this study, such as altruism.

Moreover, a personality configuration that leads one to seek experience in activities that expose one to personal, physical risk does not necessarily have a bearing on the likelihood of exposing others to risk. It may be that psychopaths experience lower-than-average anxiety in risky social rather than physical situations. This is supported by the fact that the drug-unit residents scored higher than the other two groups on the SAP and Disinhibition scales, which refer more to social risks, and the rock climbers scored higher than the other two groups on the Thrill and Adventure Seeking scale, which involves physical risks. This distinction between social and physical risks has long been recognized by Hollywood script writers who portray the Western hero as physically fearless but interpersonally shy. Making the distinction between physical and social risk taking (C. Spielberger, personal communication, March 17, 1988) eliminates the expectation that an inclination to take physical risks is a "risk factor" for the likelihood of doing harm to others.

Furthermore, it may also be necessary to distinguish between different types of social risk taking. Violations of the norms of particular societies are by no means limited to sociopaths. It is important to distinguish doing harm to others for personal gratification (antisocial behavior) from the antistructural violation of social norms in the service of positive social change.

It should be recognized that the present data do not directly test either a reductionistic or social learning model. Short of a very complex longitudinal study, such a direct test is not possible. It is possible that the antistructural and antisocial postures are either inherited or learned. The diversity of the personality and social orientations data in the three samples in this study appears to lend less support to a reductionistic perspective than to a nonreductionistic one. For example, a choice of life-styles may be a partially unconscious and partially premeditated attempt to assert one's identity—that is, how one wishes to be regarded by others—which may, in fact, be based both on social learning and on heritable personality traits.

In summary, there appear to be different types of risk taking that may have very different antecedents and consequences. Risk taking may involve physical or social action, it may be premeditated or impulsive, prosocial or antisocial. It may also be governed by a relative lack of fear or by courage based on qualities other than fearlessness. Future research on risk taking

should focus on a more comprehensive taxonomy, delineating the various antecedents of different types of risk taking.

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Appendix

The Psychopathy Scale

- T F Love is just a four letter word. T
- T F Women find me very charming. T
- T F About the only thing that ever makes me nervous is being cooped up. T
- T F People who never lie are suckers. T
- T F Feeling guilty is a waste of time. T
- T F If I don't feel like doing something, I just don't do it. T
- T F I often do things just for the hell of it. T
- T F I've fallen in and out of love dozens of times. T
- T F Most of my problems are due to the fact that people just don't understand me. T
- T F As far as people go, I can take them or leave them. T
- T F One of my chief amusements is pulling people's strings. T
- T F I have never been able to understand how anyone could pursue one goal for a long time. T
- T F I keep finding myself in the same difficulties time after time. T

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