

Evolutionary personality psychology and victimology Sex differences in risk attitudes and short-term orientation and their relation to sex differences in victimizations

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Received 4 June 2001; received in revised form 30 August 2001; accepted 12 December 2001

Abstract

Men are more often victims of events like car accidents or (violent) crimes than women with the sole exception of sexual assault. Based on the theory of sexual selection, it has been argued that these sex differences in both perpetration and victimization rates can be attributed to sex differences in risk taking and short-term orientation. Men are expected to be more risk prone than women because throughout evolutionary history, men had to engage in a higher level of intrasexual competition. However, despite the theoretical plausibility and empirical evidence at the behavioral level, there is little direct evidence that risk attitudes and short-term orientation as a sexually dimorphic personality trait mediate rates of victimization. Measures of risk attitude and short-term orientation administered to a German student sample ($N=275$) showed that: (1) the likelihood of being victimized by different kinds of negative events did correlate with both the risk attitudes and short-term orientation of a (potential) victim, (2) men had a more positive attitude towards risks and were more short-term oriented than women, and (3) sex differences in victimization rates were mediated by sex differences in risk attitudes, implying a close link between risk attitude and short-term orientation. We also show that women's risk of being raped is related to their individual risk attitude scores. © 2002 Elsevier Science Inc. All rights reserved.

Keywords: Risk taking; Risk attitudes; Short-term orientation; Sex differences; Victimizations

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1. Introduction

Men are more often victims of homicides, assaults, robberies, and car accidents than women (Chisholm, 1999; Daly & Wilson, 1988; Elander, West, & French, 1993; Kingma, 1994; Wilson & Daly, 1985). This sex difference tends to become more pronounced as the severity of the victimization increases, can be found in many different cultures, and is stable over time (Daly & Wilson, 1988).

Wilson and Daly (1985) argue that males are more often victimized than females because they more often engage in risky activities. This higher level of risk taking is explained by the fact that the variance in reproductive success is much bigger for males than for females. For that reason, men heavily compete with other men for access to fertile women (Trivers, 1972). In a series of computer simulations, Daly and Wilson (1988) showed that high levels of risk-proneness can evolve even in the presence of high mortality risks. Daly and Wilson and Wilson and Daly, thus, provide a logical extension to sexual selection theory which is able to explain why men are overrepresented both among perpetrators and victims of crime and accidents.

However, a number of empirical gaps remains to be filled. What research has revealed so far is empirical evidence for sex differences in risky behaviors, on the one hand, and a theoretical explanation for such sex differences on the other. An important next step is to demonstrate that individual and sex differences in risk attitudes as a psychic trait really do *cause* criminal victimization. The present study is meant as a first step in this direction. In the following, we define risk attitudes as one's taste (or distaste) for becoming involved in situations which are dangerous and imply the risk of physical harm.

An issue closely related to that of risk-proneness is that of individual differences in planning ahead. For a long time, criminologists have observed that one characterizing feature of criminals in general is their tendency to neglect the negative long-term consequences of their deviant behaviors (Gottfredson & Hirschi, 1990; Wilson & Herrnstein, 1985). A widely shared interpretation of this observation holds that it is the criminals' "lack of self-control" and their inability to delay gratification which leads them to engage in risky, criminal behaviors and which betrays their psychic deviance from the normal. However, an evolutionary interpretation implies that these features may not best be characterized as pathological cases. Daly and Wilson (1988, 2001) reasoned that it may be adaptive to discount the future consequences of one's behavior (i.e. to have a high level of short-term orientation) if one is living in a (social) environment which is unstable and unforeseeable. This implies that the level of short-term orientation should be negatively related to the stability of one's social environment. In line with this argumentation, Wilson and Daly (1997) showed that life expectancies (homicide excluded as cause of death) in different neighborhoods in Chicago were highly correlated with homicide rates (as an indicator of engaging in very risky behavior) and teenage pregnancies in these neighborhoods. In a questionnaire study by Hill, Thomson Ross, and Low (1997), the participants' level of risk taking was higher the more subjects perceived their future to be unpredictable and the more skeptical they were about their personal life expectancy.

However, like risk attitudes, short-term orientation has rarely been measured on an individual level (for an exception, see Kirby, Petry, & Bickel, 1999). For example, in

the study of Wilson and Daly (1997), it was hypothesized that a highly insecure environment (e.g., a short life expectancy, high homicide rates) leads to a high level of short-term orientation. In the present study, short-term orientation is measured as a personal attribute independent of any behavioral measures. In doing this, we are able to investigate the relationship between short-term orientation and risk attitudes. From a psychological perspective, are they to be regarded as independent psychic traits or is short-term orientation the very mechanism which causes individuals to become risk-takers at the behavioral level? Furthermore, it is possible to test whether men and women differ in their level of short-term orientation. Inasmuch as short-term orientation underlies or goes along with risk-taking behavior, we derive the prediction that men should score higher on short-term orientation than women (for a similar argument, see Chisholm, 1999).

Among all types of physical assaults, there is one for which women are consistently and vastly overrepresented as victims: rape (Bureau of Justice Statistics, 2001). Like other kinds of victimizations, the probability of becoming a rape victim may be partly influenced by the victims' risk proneness. One recent study suggests that selective pressure arising from the risk of rape may have shaped women's risk attitude to vary adaptively over the menstrual cycle. Chavanne and Gallup (1998) asked women of student age what they had been doing during the past 24 h and also collected information on the subjects' current phase in their menstrual cycle. Other students subsequently rated the different reported activities according to their riskiness in terms of sexual assault. Those women who were closest to ovulation at the time they were asked had engaged in significantly less risky activities compared to women at all other phases. This effect was not found for women using oral contraceptives. However, the state of research in rape is similar to that of crime and accident victimization: the presumed causal link between risk attitudes and victimization remains unestablished. In the present study, we tested the hypothesis that victims of rape do have a more positive attitude towards risks than nonvictims.

To summarize, the purpose of our study was to test the following hypotheses.

Hypothesis 1: Men score higher than women on risk attitudes and short-term orientation.

Hypothesis 2: Individual differences in victimization rates are related to individual differences in risk attitudes and short-term orientation of the victims.

Hypothesis 3: Individual differences in short-term orientation explain to a high extent individual differences in risk attitudes.

Hypothesis 4: Sex differences in victimization rates are mediated by sex differences with regard to risk attitudes and short-term orientation.

Hypothesis 5: Rape victimization among women is predicted by higher than average risk attitude scores.

We do not know of any previous study which has tested Hypotheses 4 and 5.

2. Methods and subjects

The subjects of the study were 275 law students at the University of Bochum (Germany) who were in the first 2 years of their studies. To secure a high level of homogeneity with regard to the age of the participants, 11 subjects were excluded from the sample because they were older than 25 years. The mean age of the remaining sample was 20.5 years. Males comprised 49.6% ($n = 131$) of the sample, 50.4% were female ($n = 133$).

Both risk attitudes and short-term orientation were measured using four-item scales. These measures were taken from a 24-item scale which was developed by Grasmick, Tittle, Bursik, and Arneklev (1993) and which is aimed at measuring a personality syndrome called low self control (Gottfredson & Hirschi, 1990). Because the other dimensions of this construct (simplicity, egotism, temper, and physicality) are not relevant for the current analysis, they are not discussed in the present article.

The items which were used to measure risk attitudes and short-term orientation are shown in Table 1.

Both the measure of risk attitudes and that of short-term orientation have been validated in a number of previous studies showing that they are related to high levels of deviant and criminal (i.e., risky) behavior (Arneklev, Grasmick, Tittle, & Bursik, 1993; Fetchenhauer, 1998; Longshore, Turner, & Stein, 1996; Piquero & Rosay, 1998).

A factor analysis on these eight items (principal component analysis with varimax rotation) revealed two factors with an eigenvalue > 1 . The four indicators of risk attitudes loaded on the first, while the four indicators of short-term orientation loaded on the second factor. Thus, for further analysis, two separate scales were built: (1) risk attitudes (Cronbach's $\alpha = .85$) and (2) short-term orientation (Cronbach's $\alpha = .70$).

Furthermore, subjects were asked how many times they had been victims of a car accident, bicycle theft, assault, fraud, robbery, and (only for women) rape (for the prevalence rates of these events, see Table 2). These different kinds of victimizations were not independent of each other. A factor analysis revealed that the frequencies of being victimized by car accidents, bicycle thefts, assaults, frauds, or robberies loaded on one single factor with an

Table 1
Items used to measure risk attitudes and short-term orientation^a

Risk attitudes

- (1) I like to test myself every now and then by doing something risky.
- (2) Sometimes I will take a risk just for the fun of it.
- (3) I sometimes find it exciting to do things for which I might get in trouble.
- (4) Excitement and adventure are more important to me than security.

Short-term orientation

- (1) I often act on the spur of the moment without stopping to think.
 - (2) I don't devote much thought and effort to preparing for the future.
 - (3) I often do whatever brings me pleasure here and now, even at the cost of some distant goal.
 - (4) I am more concerned with what happens to me in the short run than in the long run.
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^a Answers were given on a seven-point Likert scale, the endpoints being *I totally disagree* and *I totally agree*.

Table 2

Percentage of male and female law students who have experienced various sorts of victimizations never, once or more than once

	Number of victimizations (%)						Kendall's τ_b
	Men ($N=131$)			Women ($N=133$)			
	Never	Once	More than once	Never	Once	More than once	
Car accident	47.9	31.1	21.0	61.9	28.6	9.5	.15**
Assault	42.9	30.3	26.8	70.7	16.3	13.0	.27**
Robbery	91.6	6.7	1.7	98.0	2.0	0.0	.15**
Fraud	77.3	16.0	6.7	87.8	7.5	4.7	.13*
Bicycle theft	57.1	26.1	16.8	72.8	19.0	8.2	.16**

* $P < .05$.

** $P < .01$.

Eigenvalue of 2.0 (explaining 40.4% of the item's variance). Therefore, these different kinds of victimizations were integrated into one scale ("total number of victimizations," Cronbach's $\alpha = .62$). The (corrected) correlations of the different forms of victimizations with the total number of victimizations can be seen in Table 3.

3. Results

The first question tested was whether the victimization rates of men and women with regard to the various negative events actually differed. The results of this analysis are shown in Table 2. The prevalence rates for each event were higher for men than for women. These differences were especially high with regard to the percentage of subjects that became the victim of a certain event more than once. For example, 21.0% of all males had been involved

Table 3

Correlations between victimizations by different events and total number of victimizations, risk attitudes, and short-term orientation, respectively

	Corrected item—total correlation with number of victimizations		Risk attitudes		Short-term orientation	
	Males	Females	Males	Females	Males	Females
Car accident	.31**	.11	.29**	.05	.16*	.02
Assault	.56**	.24**	.36**	.18*	.19*	.09
Robbery	.55**	.34**	.27**	.18*	.12	.07
Fraud	.57**	.02	.26**	.11	.05	.12
Bicycle theft	.24**	.23**	.31**	.15*	.27**	.10
Rape (only women)		.32**		.17*		.02
Total number of victimizations			.43**	.24**	.22**	.15*

* $P < .05$.

** $P < .01$.

in a car accident at least twice, but only 9.5% of all females. A total of 26.8% of all men had been the victim of an assault more than once, while this was true for only 13.0% of all women. Summing up all kinds of victimizations, the average number for men was 3.4, and for women, 1.8 ($t=3.6$; $P<.01$). Thus, as in other studies, men in the present sample were victimized substantially more often than women.

The next issue investigated was whether men and women actually differ in their risk attitudes and short-term orientation. Men proved both to be more risk oriented than women (males: $M=3.3$, $S.D.=1.6$; females: $M=2.6$, $S.D.=1.2$; $t=4.5$; $P<.01$) and to score higher on short-term orientation (males: $M=3.6$, $S.D.=1.3$; females: $M=3.2$, $S.D.=1.2$; $t=2.9$; $P<.01$). The correlation between risk attitudes and short-term orientation was $r=.45$ for males and $.55$ for females ($P<.01$).

To confirm the explanation of sex differences in victimization rates that was outlined above, it is first necessary to show that victimizations are indeed related to the risk attitudes and to the short-term orientation of the victims. As Table 3 reveals, for men there was a significant relationship between risk attitude and all types of victimization we asked about: car accidents, assaults, robberies, frauds, and bicycle thefts. Furthermore, the “total number of victimizations” was positively correlated with the subject’s risk attitude score. The correlation between these measures was $r=.43$ ($P<.01$). Those males who were in the lowest quartile on the risk attitude scale had experienced 1.4 victimizations on average versus 6.0 for those scoring in the highest quartile.

For women, results were in the same direction but somewhat weaker. Furthermore, the correlation between risk attitude and involvement in car accidents and fraud did not reach statistical significance. The correlation between the total number of victimizations and risk attitudes reached a value of $r=.24$ ($P<.01$). Those females scoring in the lowest quartile of the risk attitude scale had experienced 1.2 victimizations on average, while those in the highest quartile had experienced 3.0 victimizations.

Mixed results were obtained with respect to the short-term orientation scale. All correlations between short-term orientation and victimizations were in the expected direction, but they were consistently lower than that between risk attitudes and victimizations and were only partly statistically significant.

Nonetheless, the correlation between the “total number of victimizations” and short-term orientation reached a significant value of $r=.22$ for men ($P<.01$) and $r=.15$ for women ($P<.05$).

For those males in the highest quartile of the short-term orientation scale, the number of victimizations was more than twice as high as for those in the lowest quartile (4.4 versus 2.1, respectively). The values for females were 1.4 victimizations in the lowest and 2.6 victimizations in the highest quartile, respectively.

Thus, in line with our hypotheses, men were more risk seeking and more short-term oriented than women and were more often victimized. Furthermore, the number of victimizations was related to the risk attitudes of the subjects and to their short-term orientation. However, to finally test our explanation for sex differences in victimization rates, it is necessary to show that these differences are due to sex differences in risk attitudes and short-term orientation. Technically speaking, when regressing victimizations on both risk attitudes,

short-term orientation, and sex simultaneously, only risk attitudes and short-term orientation should be significantly related to the dependent variable. To test these hypotheses, regression analyses were conducted using the frequencies of victimizations with regard to the different negative events as the dependent variables. We used risk attitudes, short-term orientation, and sex of the respondents as the independent variables. Furthermore, we controlled for respondents' age (because the number of victimizations experienced naturally increases during one's lifetime). The results of this analysis are summarized in Table 4. Despite the fact that the victimization rates of all events differed between men and women on a bivariate level (see Table 2), none of these sex differences was significant when risk attitudes and short-term orientation were analyzed simultaneously. This was also true when the total number of victimizations was used as the dependent variable.

A very similar pattern of results was obtained for age and short-term orientation. With the exception of bicycle thefts ($\beta = .11$; $P = .13$), all β coefficients for short-term orientation were smaller than .03. Age was a significant predictor only for bicycle thefts ($\beta = .14$; $P < .05$) and the total number of victimizations ($\beta = .13$; $P < .05$).

Contrary to the marginal and nonsignificant influences of sex, age, and short-term orientation, risk attitudes were significantly related to all the different kinds of victimization (all $P < .01$). When the total number of victimizations was used as the dependent variable, risk attitudes reached a β coefficient of .35.

Theoretically, the fact that sex did not reach a significant β weight in these regression analyses could have been due to an interaction effect between sex and risk attitudes and short-term orientations, respectively, as the influence of risk attitudes and short-term orientation on the frequency of victimizations might be different for males and females. To test for such an interaction effect, we calculated interaction terms by multiplying sex (female = 0; male = 1) with the risk attitude and short-term orientation scale, respectively. Then we calculated a series of hierarchical regression analyses using the various negative events as dependent variables. In the first block of independent variables, we entered age, sex, short-term orientation and risk. In the second block of independent variables, we added the two interaction terms (Jaccard, Turrisi, & Wan, 1990).

Table 4

Regression analyses to predict number of victimizations from risk attitude, short-term orientation age and sex

	β coefficient				Adjusted R^2
	Risk attitudes	Short-term orientation	Age	Sex	
Car accident	.17**	.02	.10	– .06	.04
Assault	.30**	.01	.09	– .08	.12
Robbery	.25**	– .02	.09	– .07	.07
Fraud	.22**	– .02	.04	– .03	.04
Bicycle theft	.18**	.11	.14*	– .03	.08
Scale victimization	.35**	.02	.13*	– .08	.18

* $P < .05$.** $P < .01$.

Table 5

Regression analyses to predict rape victimization using risk attitudes, short-term orientation, and age as predictors (females only)

Variable	β
Age	– .05
Risk attitudes	.23*
Short-term orientation	– .11

$R^2 = .03$.

* $P < .05$.

With regard to the interaction of short-term orientation and sex the results were very consistent. For none of the various negative events did this interaction term reach statistical significance. This was also true if the total number of victimizations was used as the dependent variable.

Concerning the interaction between sex and risk attitudes, the results were more complex. For car accidents, robberies, fraud, and bicycle thefts, the interaction term did not reach statistical significance. However, with regard to assaults, the interaction term of sex and risk attitudes increased the amount of explained variance in a statistically significant way (F change = 4.6; $P < .05$). When the interaction term was included in the analysis, it reached a β coefficient of .20 ($P < .05$) while the β coefficient of the risk attitude scale dropped from a value of .33 ($P < .01$) to .18 ($P < .05$). A similar pattern of results emerged for the total number of victimizations (F change = 7.7; $P < .01$). When the interaction term of Sex \times Risk attitudes was included in the regression equation, it attained a β coefficient of .25 ($P < .01$) and lowered the β coefficient of the risk attitude scale from .35 ($P < .01$) to .19 ($P < .01$). Thus, with regard to assaults and the total number of victimizations, the influence of risk attitudes on victimizations was stronger for men than for women.

Next, we investigated the influence of risk attitudes on rape victimizations. Four out of 133 female participants indicated that they had been raped in the past. Despite the small number of rape victims in the present study, victims had significantly higher risk attitude scores than those women who had not been raped ($M = 3.8$ versus $M = 2.5$; $t = 2.0$, $P < .05$). Cohen's d for this difference in risk attitudes is 1.1, an effect size that is classified as "large" by Cohen (1988). However, there was no significant relationship between short-term orientation and being the victim of rape ($M = 3.3$ versus $M = 3.2$; $t = 0.26$, $P = .79$). Table 4 shows the results of a regression analysis that was run to test whether risk attitudes still influenced rape victimizations once respondents' age was statistically controlled for. As can be seen, the results are very similar to the bivariate analyses: while no influence of short-term orientation could be identified, risk attitudes had a significant β -coefficient of .23 ($P < .05$) (Table 5).

4. Discussion

The main goal of this study was to test the assumption that men are more often the victim of negative events like (violent) crimes and car accidents than women *because* they differ in

their risk attitudes and short-term orientation. To summarize the results, one can say that this hypothesis could clearly be confirmed. This might not come as a surprise from the perspective of the theory of sexual selection. However, it should be mentioned that—to our knowledge—this hypothesis has never been tested before. So far, men's higher *taste for risk* has been indirectly inferred from the fact that they engage in risky *behaviors* more often than women (e.g., delinquent or criminal acts) or that they are more often the victims of certain events like homicides or car accidents. However, theoretically, these findings could also be due to other determinants. For example, men might systematically underestimate their personal risk (Hillier & Morrongiello, 1998), misperceive the base rates of negative events (Fetchenhauer & Rohde, submitted for publication), minimize the seriousness of negative events (Fetchenhauer & Rohde, submitted for publication; Morrongiello & Rennie, 1998), or systematically attribute victimizations to the situation (“bad luck”), if these victimizations indeed were caused by their reckless behavior (Morrongiello, 1997).

While all these explanations are plausible from an evolutionary perspective and are backed up by empirical research, the results of the present study show that one main reason for sex differences in victimizations lies in the fact that men do have a higher taste for risk than women. With regard to each single event that was investigated, the following pattern emerged. (1) Victims had higher values on the risk attitude and short-term orientation scales than nonvictims. (2) Men were more often victimized than women. (3) Victimization rates did not differ between the sexes when the statistical effects of risk attitudes and short-term orientations were eliminated. This pattern of results showed up for car accidents, violent crimes (like assaults and robberies) and property crimes (like fraud or bicycle thefts).

The consistency of these results is quite remarkable given the fact that becoming the victim of a certain event is certainly influenced not only by the personality of the victim (e.g., his or her risk attitude), but also by many other factors that are not influenced by the victim at all. For example, with regard to car accidents, we did not ask the subjects whether they had driven the car themselves or whether they were just passengers. We also did not ask whether they were found guilty of causing the accident or not. Nevertheless, men were more often involved in car accidents than women and these victims of car accidents had higher risk attitude scores than nonvictims. It should be noted that this pattern of results cannot be explained by the assumption that men drive cars more often than women. If this were true, sex differences in victimizations should persist when risk attitudes and sex are included as predictors in our regression analysis, but this was not the case.

Risk attitudes and short-term orientation were highly correlated with each other. On a bivariate level, both dimensions were positively correlated with the total number of victimizations. However, in the multivariate regression analysis, the number of victimizations was determined only by risk attitudes while short-term orientation had no influence at all. Thus, it seems that the influence of short-term orientation on risky behavior (and, hence, victimizations) is mediated by risk attitudes. This result is in line with the theoretical considerations of Wilson and Daly (1997; Daly & Wilson, 2001). It seems that a high level of short-term orientation determines a positive attitude towards risks which then determines a high level of (objectively) risky behaviors and, finally, leads to a higher chance of victimization by accident or crime.

Remarkably, risk attitudes also differed between victims and nonvictims of rape. This result is in line with the assumption that a high level of risk aversion can be regarded as a female strategy of rape prevention. Given the small number of rape victims in the present sample, this result should surely be treated with caution. However, in another study with a comparable sample of 126 female law students, we were able to replicate this finding. As in the present study, the risk attitudes of the three rape victims were significantly more positive than those of the 123 nonvictims, and Cohen's effect size measure was "large" ($d = 1.1$). In future studies, the relationship between being raped and risk attitudes should be investigated more systematically. Of course, the claim that her risk attitude is one determinant of a woman's likelihood of being raped should not be misunderstood as an attempt to "blame the victim."

The fact that victimizations generally were determined by risk attitudes also explains why different types of victimization were not independent but were highly correlated. This result is in line with a number of studies showing that involvement in car accidents predicts crime victimization (Keane & Arnold, 1996) and that a good predictor of future victimizations is past victimizations (Wittebrood & Nieuwbeerta, 2000). However, to our knowledge, it has never before been shown that risk attitudes as a personality variable are related to victimizations and that sex differences in risk attitudes mediate.

Surely, the present article does not provide a final answer to the question of how victimizations by crimes and accidents are influenced by sex and risk attitudes. There are a number of questions that should be addressed in future studies.

(1) In the present research, we did not investigate the causes of why people differ in their level of short-term orientation and risk attitudes. There are a number of possible determinants that appear to be plausible. On the one hand, one might argue that these individual differences are genetically determined. In a recent twin study, variability in risk attitudes was found to have a heritable component (Miles et al., 2001). On the other hand, one could argue that short-term orientation and risk attitudes are flexible reactions to certain cues in the environment (Chisholm, 1999; Wilson & Daly, 1997; Hill et al., 1997). It should be noted that genetic explanations and explanations which regard the level of risk attitudes and short-term orientation as being influenced by conditions of one's social environment are not mutually exclusive. They may both explain some fraction of the variance in risk attitudes and short-term orientation among individuals.

(2) In the present study, we only worked with self-ratings and self-reported experiences. It would surely be worthwhile to replicate our findings using independent behavioral measures of victimizations.

(3) Additionally, in future studies the relationship between risk attitudes and related constructs like low self-control (Schreck, 1999) or sensation seeking (Zuckerman, 1994) and their influence on victimizations should be examined.

(4) Another important aspect that merits further investigation is testing for possible statistical interaction effects of sex and risk attitudes as determinants of victimizations by crimes and accidents. In the present study, such an interaction effect emerged with regard to assaults, but not with regard to any of the other negative events that were studied (i.e., car accidents, robbery, fraud and bicycle thefts). One possible explanation why such an

interaction effect could only be found for assaults might be that a high level of risk attitudes leads men to struggle for social status with other men, which then leads to involvement in assaults (as a perpetrator or as a victim). Possibly, because of their lower level of intrasexual competition, women are less involved in such status seeking encounters than men even if they are risk seeking to a high degree (Daly & Wilson, 1988).

To summarize, one can say that in the present study, victimization rates were strongly influenced by the risk attitudes of the respondents and that sex differences in these risk attitudes mediated sex differences in victimizations. We hope that this article might stimulate others to further elaborate the field of sex differences in risk taking and victimizations.

Acknowledgments

We would like to thank Hans-Dieter Schwind for giving us the opportunity to distribute questionnaires during his lectures. Furthermore, we are thankful to Bram Buunk, Aurelio Jose Figueredo, and one anonymous reviewer for their critical comments on an earlier version of this article.

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