



PRESENT TIME PERSPECTIVE AS A PREDICTOR OF RISKY DRIVING

Philip G. Zimbardo,* Kelli A. Keough and John N. Boyd

Department of Psychology, Stanford University, Jordan Hall Building 420, Stanford, CA 94305-2130, U.S.A.

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Summary—This research introduces a new individual difference variable, time perspective, as an important predictor of risky driving. Across three separate replications, with 2863 participants, present time perspective is significantly correlated with reported risky driving behaviors. Its effect is greater than, and independent of, the negative correlations between future time perspective and risky driving. Additionally, males are more present-oriented and report taking more risks than females, while females are more future-oriented. Regression analyses and discriminate validity assessments demonstrate that present time perspective remains an independent predictor of risky driving even when pitted against nine other measures previously reported as related to driving risk, such as, sensation seeking, impulsivity, and aggression. Although complicated by the number of factors potentially involved, it is imperative to attempt to predict such risk because of the enormous economic and psychological toll resulting from auto accidents and fatalities related to risky driving. Discussion centers on implications for education based on understanding the psychological dynamics of time perspective and links to general risk-taking and self-regulation. © 1997 Elsevier Science Ltd. All rights reserved

INTRODUCTION

Driving can be an instrumental activity simply used to get from point A to point B efficiently, but in America it is often much more. Driving is a mark of status, a symbol of power and sexuality, a means of individuation, and an instrument for forging independence. It is youths' most obvious sign of coming of age. While advertisements play on these virtues, movies, such as, *American Graffiti*, *Easy Rider*, *Rebel Without a Cause*, and *Thelma and Louise* glorify associations with freedom, rebellion, openness to new experience, and the exhilaration of life lived in the fast lane—however briefly. The motto, “live fast, die young, and leave a good-looking corpse,” resonates throughout American culture. This saying reflects attitudes held by many, and, through socialization processes, it also influences the development of similar attitudes in the young.

Although such short-sighted attitudes surrounding driving are glamorized, they also rob thousands of teenagers of their future each year. Motor vehicle crashes are the leading cause of death among youngsters in the U.S. (Karpf & Williams, 1983), with as many as 50% of all teenage deaths due to traffic crash injuries (Perrine, Peck & Fell, 1989). The majority of these fatal crashes are alcohol-related, and the financial costs associated with alcohol-related crashes in the U.S. alone have been estimated at a quarter of a billion dollars annually (Volpe, 1983). The psychological and emotional losses to all those involved are incalculable. *How* one drives should be a behavior of interest to social and personality psychologists because of three inter-related principles: driving is a complex interaction of driving skills, attitudes, personality factors, and social-situational variables; driving results largely from a need for transportation in a social world; also societal costs from traffic accidents and deaths can be reduced by improved educational programs that integrate relevant psychological factors with improved driver training.

Research in this area often distinguishes between driving skills and driving style. The skills component includes practice, reaction time, and tracking as limits to optimal performance. Driving

*To whom all correspondence should be addressed.

style, or habits, include the ways an individual chooses to drive based on attitudes, beliefs, and personality traits. Among those potentially destructive habits are preferences for speed, overtaking, tailgating, and propensity to commit traffic violations. Among the factors found to be related to risky driving styles are the personality variable of impulsiveness, the individual difference variable of sensation seeking, overconfidence in one's own driving ability, lack of concern for consequences of risky driving, and deviant driving behaviors, such as running red lights (Arnett, 1990; Beck, 1981; Donovan, 1993; Donovan, Marlatt & Salzberg, 1983; Elander, West & French, 1993; Farrow, 1989; West, Elander & French, 1992; Yu & Williford, 1993).

One individual difference variable that has not been investigated previously as a possible predictor of risky driving, and that may add to our predictive power, is that of *time perspective*. Time perspective can be defined as the manner in which individuals, and cultures, partition the flow of human experience into the distinct temporal categories of past, present, and future. The boundaries, extension, salience, and utilization of any of these categories may vary considerably as a function of learned preferences that become stabilized into a functional cognitive style, and also as a consequence of situational, structural, and task demands (see Gonzalez & Zimbardo, 1985; Zimbardo & Boyd, in preparation; Zimbardo, Marshall & Maslach, 1971). Conceptually, time perspective affects decision making by locating the primary set of psychological influences within the temporal frames of either the present, past, or future. 'Present-Oriented' individuals tend to rely on the immediate, salient aspects of the stimulus and social setting when making decisions and taking actions. By contrast, the decisions of 'Future-Oriented' individuals tend to be based on anticipated consequences of imagined future scenarios, while those of 'Past-Oriented' individuals tend to rely on recall of reconstructed past scenarios.

On the basis of case studies, surveys, and repeated factor analyses (both exploratory and confirmatory), we have developed a scale to assess individual differences in time perspective based on a conceptual model of the characteristic cognitive style and attitudes of those believed to be past, present or future-oriented. Refinements over a decade have yielded a reliable, valid, economical measure of time perspective using an objective paper-and-pencil test, called the Zimbardo Time Perspective Inventory, or ZTPI (Zimbardo, in preparation; Zimbardo & Boyd, in preparation) (see the Method section of Study 1 for psychometric details). Although it is possible to identify those with extreme cognitive biases that yield high scores on only one time dimension with low scores on the others, it is possible to construct individual profiles for each time perspective dimension because the sub scales are empirically independent.

A recent body of research from our laboratory implicates the dynamic process of time perspective as important in the decision to engage in a variety of risk-taking behaviors. For example, across a large population of more than 2500 respondents, from 15 diverse samples, significant positive correlations were found between present time perspective and alcohol use, smoking, and illegal drug use (Keough, Zimbardo & Boyd, under review). Those who endorsed a time perspective that focused on the immediate, 'present' life space as the determinant of their actions were most likely to engage in a broad spectrum of substance use. Their behavior contrasts with that of peers who endorsed a future time perspective that focused on a cost/benefit analysis framed by consideration of abstract options and contingencies (see Moore & Gullone, 1996; Zaleski, 1994).

We predict that risky driving is related to individual differences in time perspective based on its association with other risk-taking behaviors. Individuals that score higher on the present subscale of the ZTPI should report more risky driving, because their behavior is less under the control of past experience, or potential future consequences, they will be responsive to vivid factors in the present behaviors space, such as the excitement of speeding, the demonstration of skill and independence, and the admiration of peers. By contrast, the behavior of peers who are more future-oriented is dominated by the ways they construct anticipated situations and construe expected positive and negative outcomes. Therefore, they should be more risk averse, and we predict that future time perspective will be negatively correlated with risky driving. We make no predictions about the association of past-orientation and risky driving, so have not included that dimension in this research.

These predictions were tested in three separate studies with large samples of respondents from diverse populations. The final study compares the relative predictive value of time perspective with that of a host of previously established predictors of risky driving.

STUDY 1

Method

We examined data from six separate samples to test our hypothesis that a present time perspective orientation would predict risky driving behaviors.

Participants

Across the six samples, 1714 students participated. The participants were college students from California and New York, and were somewhat diverse in age, sex, and ethnicity. The samples included students from Cornell University ($n = 690$); San Francisco State University ($n = 255$), and 4 separate groups at Stanford University ($n = 769$). Demographic information about the samples is shown in Table 1.

Materials

Participants completed the following measures:

(a) *Zimbardo time perspective inventory*. The ZTPI (in this short version) contains 2 subscales, a present scale and a future scale. Items are assessed on a 5-point Likert scale according to 'how characteristic' each statement is of the respondent. The 13-item Future Time Perspective (FTP) scale showed reasonable internal reliability across the samples, averaging $\alpha = 0.70$ (range = 0.66 to 0.72). Examples of future questions include: "I believe that a person's day should be planned ahead each morning," and "I am able to resist temptations when I know there is work to be done." The Present Time Perspective (PTP) scale, which contains nine items, had an average $\alpha = .62$ (range = 0.57 to 0.66). The present scale includes questions such as: "I don't do things that will be good for me if they don't feel good now," and "I feel that it is more important to enjoy what you are doing than to get the work done on time." For the studies reported here, however, we excluded one scale item ("I get drunk at parties") because of its overlap with one risky driving item ("driving under the influence of alcohol"). Test-retest reliability 16 weeks apart was 0.73 for the FTP scale, and 0.70 for the PTP among students at the University of Illinois, Chicago (Jourden, 1993).

The means on the ZTPI did not vary much across the samples (FTP overall $M = 3.35$, $SD = 0.54$, sample scores ranged from 3.25 to 3.43; PTP overall $M = 2.72$, $SD = 0.56$, sample scores ranged from 2.66 to 2.84). Despite similarities in the central tendencies of the six samples, males reported consistently higher present scores than did females in every sample. Pooling all sample data revealed that the difference between males ($M = 2.84$, $SD = 0.56$) and females ($M = 2.62$, $SD = 0.55$) on the PTP scale was highly significant ($z = 8.04$, $p < 0.0001$, $N = 1648$). Females reported higher FTP scores

Table 1. Demographics by sample

Sample	N	Mean Age	% Female	Ethnicity
Cornell University	690	18.74 (1.17) min = 16 max = 31	59%	1% African-American 67% Caucasian 15% Asian-American 5% Hispanic/Latino 12% Other
Stanford University I-III	582	unavailable	54%	6% African-American 52% Caucasian 25% Asian-American 9% Hispanic/Latino 8% Other
Stanford University IV	187	unavailable	58%	9% African-American 49% Caucasian 26% Asian-American 12% Hispanic/Latino 4% Other
San Francisco State Univ.	255	20.68 (3.81) min = 16 max = 50	60%	4% African-American 6% Caucasian 67% Asian-American 15% Hispanic/Latino 8% Other

Note: Mean age is given in years. Standard deviations are in parentheses.

in all of the samples than did males, although this difference was not as consistently significant statistically nor was the effect size as large as the difference in present time perspective scores. Nevertheless, the difference between males ($M = 3.29$, $SD = 0.56$) and females ($M = 3.39$, $SD = 0.51$) on the FTP scale was still significant when the samples were pooled ($z = -3.63$, $p < 0.0003$, $N = 1648$).

(b) *Health and risk questionnaire.* This questionnaire contains items that are assessed on a 5-point scale according to how frequently the participants engaged in each of the behaviors, where: 0 = "never," 1 = "rarely," 2 = "sometimes," 3 = "often," and 4 = "always." This version of the Health and Risk Questionnaire contains 37 questions. For purposes of this paper, only five items will be discussed: taking risks driving, car racing, speeding, taking risks biking, and driving under the influence of alcohol. We first standardized the items before averaging them into a "risky driving" scale ($\alpha = 0.66$). (Data on substance use have been reported in Keough *et al.*, under review).

Speeding (overall $M = 2.55$, $SD = 1.19$) and taking risks driving (overall $M = 1.16$, $SD = 0.99$) were the most frequently reported behaviors, followed by taking risks biking (overall $M = 0.74$, $SD = 0.99$), car racing (overall $M = 0.27$, $SD = 0.59$), and then driving under the influence (overall $M = 0.15$, $SD = 0.46$). Males reported more frequent risky driving (overall standardized $M = 0.26$, $SD = 0.71$) than females did (overall standardized $M = -0.13$, $SD = 0.55$), $z = -12.47$, $p < 0.0001$, $N = 1599$.

Samples and procedures

All participants completed both the ZTPI and the Health and Risk Questionnaire for course credit associated with their introductory psychology class. At Cornell University and San Francisco State University students participated as part of a class project, while the Stanford University students participated as part of their course research requirement over four separate terms.

RESULTS

Overview

We have found significant relationships between frequency of risky driving and individual differences in time perspective. The data revealed that present time perspective is a much better predictor of driving risks than is future time perspective, and further, that present and future time perspectives are not opposite endpoints of a single scale, but rather represent independent measures of an individual's psychological time orientation. Additionally, we examined the importance of gender as a predictor of risky driving.

Time perspective and frequency of risky driving

Directly in line with our hypothesis, those college students who were more present-oriented reported more risky driving behaviors. Correlations between risky driving and the present subscale ranged from .18 to .33 across each of the six subsamples, with the pooled correlation $r(1662) = 0.29$, $p < 0.01$. These data support the empirical conclusion that present-oriented people are more likely to report risky driving. While those with higher PTP scores reported higher rates of risky driving than did those with lower PTP scores, the predicted negative relationship between FTP and risky driving was not nearly as strong in any of the samples. Nevertheless, the negative correlation between FTP and frequency of risky driving was significant when pooled across the samples ($r(1662) = -0.08$, $p < 0.01$; range = -0.01 to -0.18). Obviously the large sample sizes contributed to making this weak correlation statistically significant. This finding indicates that future time perspective is not as important as a predictor variable in risky driving as is present time perspective.

Are future and present time perspectives independent predictors?

Every sample showed a negative correlation between FTP and risky driving, but a positive correlation between PTP and risky driving. The opposite direction of correlations between future and present time perspective and the risky driving scales suggests that present and future time perspective may be merely reverse-coded scales of each other. This suggestion at first seems reasonable based on the negative pooled correlation between FTP and PTP scales across the samples ($r(1714) = -0.35$, $p < 0.01$). Perhaps those individuals high on the present scale who report higher

frequency of driving risks are also likely to be very low on the future time perspective scale? If so, low future scores should also predict risky driving, and there is no theoretical justification for the two ZTPI scales when attempting to predict risky driving. However, this is not the case. The correlations between PTP and the risky driving scales remained very high across all of the samples *after* partialling out FTP (pooled: $r(1659) = 0.28, p < 0.01$). Also, the following multiple regression analysis illustrates that present time perspective was consistently a better predictor of risky driving than was future time perspective. We will consider the implications of these results in the Discussion section.

A backward multiple regression was performed between the independent variables: FTP, PTP, gender, the interactions between future and present, future and gender, present and gender, and sample, with the risky driving scale as the dependent variable. These variables accounted for 11% of the risky driving variance ($F(3, 1607) = 62.84, p < 0.01$). Of primary interest, PTP was the *most* significant predictor of risky driving ($t = 11.72, p < 0.0001$). Males were more likely to report risky driving than females ($t = 5.41, p < 0.01$), but this gender difference was attenuated by future time perspective, as evidenced by the significant interaction between gender and future time perspective ($t = -2.25, p = 0.025$).

DISCUSSION

Our initial study has established a significant association between time perspective and risky driving. Significant gender differences reveal that males are more present-oriented than females, females are more future oriented than males, and this effect is manifested in the greater extent of male risky driving. Although the present and future scales are negatively correlated, they are not merely mirror or conceptual opposites. Rather, their effects on risky driving are independent, as shown by the continued significant impact of PTP on risky driving after controlling for FTP and the regression analysis establishing PTP as the primary predictor variable of risky driving.

From our composite dependent measure, the two most frequently reported behaviors are speeding and taking risks driving, both of which are driving style factors previously shown to be associated with increased crash risk (Elander *et al.*, 1993). Although we have only measured reported driving risks rather than actual behavioral assessment of risky driving, a body of other research converges on the same pattern of risky driving behaviors among younger drivers whether the data come from observational (e.g. Wasielewski, 1984), survey (e.g. Jonah & Dawson, 1987), or official driving violations (Peck, 1985).

A strength and limitation of our sample of respondents is that they represent students at major universities. It is thus surprising to find even these highly educated students reporting risky driving practices. We might expect such a group to be more risk averse and more future-oriented than the general population. However, their homogenous educational, social class, and age characteristics limit the extent to which we may generalize our findings. Our next study sought to remedy this limitation. In addition, we needed to determine whether PTP is simply a proxy for sensation seeking, which has already been established as a predictor of self-reported driving style and crash risk (e.g. West *et al.*, 1992).

STUDY 2

Method

To broaden the findings in Study 1 relating present time perspective to risky driving, we replicated our procedure utilizing five more diverse samples of participants.

Participants

Across the five samples, 943 students participated. The participants were high school, university and community college students, adults, and juvenile delinquents under the age of 21. These samples were from California and Illinois, and were diverse in age, sex, and ethnicity. The samples included students from two high schools ($n = 210$); summer school students at Stanford University and the University of Illinois ($n = 150$); students from three community colleges ($n = 456$); males incarcerated

Table 2. Demographics by sample

Sample	N	Mean Age	% Female	Ethnicity
Two high schools	210	15.84 (0.96) min = 14 max = 18	52%	0.5% African-American 75% Caucasian 13% Asian-American 3% Hispanic/Latino 8.5% Other
Summer: Stanford and Illinois	150	20.89 (5.87) min = 16 max = 60	50%	5% African-American 63% Caucasian 19% Asian-American 6% Hispanic/Latino 7% Other
Three community colleges	456	23.09 (7.27) min = 16 max = 67	57%	6% African-American 38% Caucasian 37% Asian-American 12% Hispanic/Latino 7% Other
California Youth Authority	24	19.00 (1.14) min = 17 max = 22	0%	33% African-American 17% Caucasian 50% Hispanic/Latino
Driving school	103	32.64 (9.20) min = 17 max = 67	38%	Not available

Note: All individuals in the California Youth Authority are male. Mean age is given in years. Standard deviations are in parentheses.

in the California Youth Authority ($n=24$); and adults participating in a driving school ($n=103$). Demographic information about the samples is shown in Table 2.

Materials

As in Study 1, participants completed the ZTPI and the Health and Risk Questionnaire. The 13-item future scale showed reasonable internal reliability across the samples, averaging $\alpha=0.65$ (range = 0.58 to 0.71) (excluding the California Youth Authority because of its small sample size). The original 9-item PTP scale had an average $\alpha=.64$ (range = 0.57 to 0.70). (As in Study 1, we excluded one item on drinking from the present scale in all subsequent analyses.) The mean scores on the ZTPI again did not vary much across the samples, even though the samples were quite diverse (FTP overall $M=3.41$, $SD=0.53$, sample scores ranged from 3.27 to 3.56; PTP overall $M=2.80$, $SD=0.61$, sample scores ranged from 2.67 to 2.91). Again, males reported consistently higher present scores than did females in every sample. Pooling the data from all samples, we found that the difference between males ($M=2.95$, $SD=0.61$) and females ($M=2.65$, $SD=0.58$) on the PTP scale was highly significant ($z=7.71$, $p<0.01$, $N=935$). In contrast, females reported higher future scores in all of the samples than did males, although this difference was not as consistently significant statistically nor was the effect size as large as the difference in present time perspective. Nevertheless, the difference between males ($M=3.33$, $SD=0.53$) and females ($M=3.48$, $SD=0.52$) on the future scale was still significant when the samples were pooled ($z=-4.40$, $p<.01$, $N=935$).

From a revised version of our Health and Risk Questionnaire we selected the same five items used in Study 1: taking risks driving, car racing, speeding, taking risks biking, and driving under the influence. We first standardized the items before averaging them into a 'risky driving' scale ($\alpha=0.68$). Speeding (overall $M=2.34$, $SD=0.95$), and taking risks driving (overall $M=1.44$, $SD=1.01$) were the most frequently reported behaviors, followed by taking risks biking (overall $M=0.85$, $SD=1.11$), car racing (overall $M=0.49$, $SD=0.88$), and then driving under the influence (overall $M=0.41$, $SD=0.73$). Again, males reported more frequent risky driving (overall standardized $M=0.32$, $SD=0.75$) than females did (overall standardized $M=-0.09$, $SD=0.61$), ($z=-9.23$, $p<0.01$, $N=916$).

In addition to the ZTPI and the Health and Risk Questionnaire, the summer students from Stanford and Illinois completed the Sensation Seeking Scale (SSS) (Zuckerman, 1994; Zuckerman, 1988; Zuckerman, Eysenck & Eysenck, 1978) to investigate apparent similarities between present time perspective and sensation seeking and to determine the extent of overlapping and unique risky behaviors variance predicted by each. This scale contains 40 items on which participants choose the one of two statements that best describes their preferences. The SSS contains the following four

subscales, each consisting of ten items: disinhibition, boredom susceptibility, thrill and adventure seeking, and experience seeking. As with the ZTPI, the SSS contains five items that directly ask participants about substance use. Because these questions overlap with the "driving under the influence of alcohol" dependent variable, we excluded these 5 problematic items in the analyses. The average score for the SSS without the five items was 53.07 ($SD = 5.44$), and males reported higher sensation seeking scores than did females ($t(148) = -3.40, p = .01$; males = $M = 54.41, SD = 5.30$; females = $M = 51.73, SD = 5.50$). The internal reliability was $\alpha = .78$. (The SSS means are higher than they would be as normally scored, with '0' and '1' responses, only because we used '1' and '2' scoring.)

Samples and procedures

The following five samples were included in this study. (1) Students from the two high schools in Palo Alto and Los Gatos, California completed the ZTPI and the Health and Risk scale as part of class projects on psychology. (2) We combined the Stanford summer sample with the University of Illinois sample, which both completed the ZTPI, the Health and Risk scale, and the Sensation Seeking Scale during the same summer session. Stanford students were either paid \$5.00 or received research credit for their participation. University of Illinois students received research credit for their participation. (3) Students from Cañada College, the College of San Mateo, and San Francisco Community College (two-year schools all in the S. F. Bay area) completed the ZTPI and the Health and Risk scale as part of a class project. (4) Males incarcerated in the California Youth Authority completed the ZTPI and the Health and Risk scale, their participation was voluntary, but compliance was high, affected in part by the promise of gifts of books to their library. (5) Participants in several traffic schools in Northern California completed the ZTPI and the Health and Risk scale during a break in their day-long traffic course. California state residents have the option of attending a traffic school after receiving a minor moving violation so that the moving violation does not go on their record. Participants were paid \$3 for their participation in the study (by our senior author, a fellow violator).

RESULTS

Overview

The predicted significant relationships were again found between reported frequency of risky driving and present time perspective across these diverse samples, as was the independence of the future and present subscales. Additionally, we examined the importance of gender as a predictor of risky driving, and then compared the predictive capabilities of the Sensation Seeking Scale (SSS) and present time perspective (PTP) scale.

Time perspective and frequency of risky driving

As predicted, those who were more present-oriented reported more risky driving behaviors. The correlations between risky driving and the present subscale ranged from 0.22 to 0.36 across the samples (not including the small CYA sample), and when the samples were pooled, $r(916) = 0.32, p < 0.01$, supporting the conclusion that present-oriented people are more likely to report risky driving. While those with a higher PTP reported higher rates of risky driving than did those with lower PTP scores, the negative relationship between future time perspective and risky driving was not nearly as strong in any of the samples. This finding indicates that FTP is not as important in the prediction of reducing risky driving as is PTP. Nevertheless, the negative correlation between FTP and frequency of risky driving was significant when pooled across the samples ($r(916) = -0.15, p < 0.01$; range = 0.16 to -0.20). Incidentally, the only positive correlation between future orientation and driving risk was found among adult traffic violators in driving school, which appeared from personal reports to be due to speeding, running yellow lights, and failure to stop—in order to get to work and appointments on time.

Are future and present time perspectives independent predictors?

We again examined the hypothesis that the future and present scales are tapping into the same construct because the pooled negative correlation between the FTP and the PTP scales across the samples was significant ($r(937) = -0.28, p < 0.01$). Again, the data do not support this hypothesis. The correlations between the PTP and the risky driving scales remained high *after* partialling out FTP (pooled: $r(913) = 0.29, p < .01$). The following multiple regression analyses further illustrate that present time perspective was consistently a better predictor of risky driving than was future time perspective.

Because of the diverse nature of these samples, we performed separate regressions for each sample (excluding the California Youth Authority, which only had 24 participants), in addition to a pooled analysis. Each backward multiple regression was performed between the independent variables of: FTP, PTP, gender, and the interactions between future and present, future and gender, present and gender, with the risky driving scale as the dependent variable. See Table 3 for the regression parameters for these analyses. In all four samples, present time perspective was a significant predictor of risky driving. Males were more likely to take driving risks than females in all but the older driving school sample. The pooled analysis revealed that highest risky driving is most likely among present-oriented males in high school.

Discriminant validity of time perspective and sensation seeking

To investigate possible similarities between present time perspective and sensation seeking, as well as the amount of overlapping and unique risky driving variance predicted by each, participants from the Stanford and Illinois summer sample completed the Sensation Seeking Scale (SSS). In this final section, we present results that suggest that while time perspective shares some similarities with sensation seeking, time perspective remains an important independent contributor to predicting risky driving use even after controlling for the effects of sensation seeking.

The correlation between present time perspective and sensation seeking was 0.33 ($p < 0.001$; correlation disattenuated for scale reliability = .46, $p < 0.01$) and future time perspective and sensation seeking was -0.12 ($p = 0.15$). This high correlation between PTP and SSS would not seem to bode well for the time perspective variable, because if time perspective and sensation seeking overlap to a great degree, there is no theoretical need for a separate time perspective analysis. To investigate whether time perspective uniquely predicts any of the variance of the risky driving scale, we partialled out the total sensation seeking score from the correlation between time perspective and risky driving. When controlling for SSS, we found that a significant correlation still remained

Table 3. Regression parameters for frequency of risky driving by sample

Sample	Variable	<i>B</i>	S.E. <i>B</i>	<i>t</i>	<i>p</i> -value
Two High Schools <i>R</i> ² = 0.16 <i>N</i> = 202 <i>F</i> (3,199) = 13.01, $p < 0.0001$	Present	0.38	0.08	4.94	0.0001
	Gender	0.21	0.10	2.12	0.03
	Future \times Gender	-0.40	0.21	-1.90	0.06
	Intercept	-0.92	0.23	-4.04	0.0001
Summer: Stanford & Illinois <i>R</i> ² = 0.22 <i>N</i> = 144 <i>F</i> (3,141) = 13.10, $p < 0.0001$	Present	0.23	0.09	2.52	0.01
	Gender	0.39	0.11	3.67	0.0003
	Present \times Gender	0.53	0.18	2.89	0.005
	Intercept	-0.76	0.24	-3.23	0.0015
Three Community Colleges <i>R</i> ² = 0.20 <i>N</i> = 441 <i>F</i> (5,436) = 21.68, $p < 0.0001$	Present	0.24	0.05	4.56	0.0001
	Gender	0.46	0.07	7.03	0.0001
	Future \times Present	-0.19	0.08	-2.31	0.02
	Present \times Gender	0.21	0.11	1.90	0.06
	Future \times Gender	0.37	0.12	3.01	0.003
Driving School <i>R</i> ² = 0.16 <i>N</i> = 100 <i>F</i> (2, 98) = 9.01, $p = 0.0003$	Intercept	-0.81	0.15	-5.56	0.0001
	Present	0.39	0.10	3.89	0.0002
	Gender	0.25	0.13	1.93	0.06
	Future	-1.90	0.55	-3.42	0.0009
All Samples <i>R</i> ² = 0.17 <i>N</i> = 913 <i>F</i> (4,909) = 45.90, $p < 0.0001$	Intercept	-0.81	0.15	-5.56	0.0001
	Present	0.29	0.04	7.94	0.0001
	Gender	0.33	0.04	7.42	0.0001
	Present \times Gender	0.19	0.07	2.64	0.009
	High School	0.20	0.05	3.80	0.0002
	Intercept	-0.90	0.10	-8.97	0.0001

between PTP and risky driving ($r(142)=0.27, p=0.01$). That correlation is only slightly reduced from the pooled sample correlation of .32 reported previously between PTP and risky driving.

We performed one final test to determine if present time perspective is theoretically different from sensation seeking. A backward multiple regression was performed between the independent variables of: FTP, PTP, gender, the interactions between future and present, future and gender, present and gender, and sensation seeking, with risky driving as the dependent variable. Sensation seeking, present time perspective, gender, and the interaction between gender and present time perspective remained in the model, which accounted for 36% of the variance, $F(4, 140)=19.79, p<0.01$. Future time perspective dropped out of the model. Sensation seeking was a more important predictor of risky driving than was present orientation, in terms of relative degree of significance (SSS: ($t(144)=4.42, p<0.01$; PTP: ($t(144)=2.21, p=0.03$). Gender ($t(144)=3.88, p<0.01$), and the interaction between gender and PTP ($t(144)=2.02, p<0.05$) added to the predictive value of the model. Most importantly, from our theoretical orientation, present time perspective stayed in the model to predict a unique amount of the variance of the risky driving scale, and males who were more present-oriented were more likely to report more risky driving.

DISCUSSION

Again, the data reveal a strong relationship between a present time perspective and risky driving, with a weaker, but still significant, negative relationship of future time perspective and risky driving. We also replicate several other findings from our first study: males are more present and less future-oriented than females; males report more risky driving than do females; the effects of PTP on risky driving are independent of FTP, and speeding and taking risks driving are also the most frequently reported items on the risky driving composite. These effects hold for each of these very different samples of respondents, thereby allowing us to broaden the basis of our generalizations. Only with the sample of adult traffic violators did we find an exception of note, there was no gender effect on risky driving. Females were as likely as males to report engaging in risky driving. We interpret this finding as validating our risky driving measure since these women are, by their status as traffic offenders, higher in actual driving risk.

The new feature in this replication was the direct comparison of PTP and SSS on risky driving. Despite a moderately high correlation between these scales, present-orientation sustained an independent contribution to predicting risky driving, both when SSS was partialled out of the relationship and with a statistically significant effect within a regression analysis. Nevertheless, sensation seeking remains a powerful predictor of risky driving, and led us to conjecture about other personality variables that have been related to driving risks and crashes which might also overlap with our PTP scale. Our next study attempted to clarify the myriad of individual differences scales as they relate to risky driving and time perspective.

STUDY 3

Method

The results from Studies 1 and 2 demonstrate that present time perspective orientation is significantly related to higher frequencies of risky driving. Additionally, PTP is an independent predictor of risky driving even after controlling for sensation seeking. However, we are still left with questions of discriminant validity. Is time perspective a new variable, or is it merely a new name for a personality trait that has already been related to risky driving? In Study 3, we first replicate the results from Studies 1 and 2, and then go on to investigate the discriminant validity of present time perspective by examining its ability to predict risky driving independently when compared to nine individual difference variables that have been related previously to risky driving. Specifically, we again examine sensation seeking, as well as aggression, ego undercontrol, impulse control, novelty seeking, reward dependence, and family income. Additionally, we examine how well time perspective predicts risky driving compared to two recently published scales that have conceptual overlap with our time perspective construct: consideration of future consequences (see Strathman, Gleicher, Boninger & Edwards, 1994) and preference for consistency (see Cialdini, Trost & Newsom, 1995).

Participants

Students from the College of San Mateo (CSM), a community college in Northern California, completed the study ($n=206$, 65% female). Participants' ages ranged widely from 16–62 years ($M=23.63$, $SD=8.60$), and 49% reported their ethnicity as white or Caucasian, 24% Asian or Asian-American, 14% Hispanic or Latino, 2% African-American or Black, and 11% 'other.' Their median family yearly income was a relatively high \$70 000–100 000, which amounts to a 'working, middle-class' in their expensive local environment.

Materials and procedure

Students voluntarily participated in the study (with the added incentive of being eligible to win one of two \$50 lottery prizes if they completed the study). They completed the following questionnaires (which, after the Health and Risk Questionnaire, are listed in alphabetical order):

(a) *Demographics*. On this questionnaire, students indicated their gender, age, year in school, race, religion, their family's approximate yearly income, and they indicated the economic class of their immediate family, their mother's parents, and their father's parents by checking a 9-point scale that ranged from lower working-class to top upper-class.

(b) *Zimbardo time perspective inventory*. The average score on the 13-item future scale ($\alpha=.65$) was 3.47 ($SD=0.49$). As in Studies 1 and 2, females had significantly higher FTP scores than did males (females: $M=3.53$, $SD=0.47$; males: $M=3.33$, $SD=0.49$; $t(200)=2.81$, $p<.01$). The average score on PTP (without the drinking item) was 2.94 ($SD=0.58$), males had insignificantly higher scores than did females ($t(200)=-1.53$, $p=.13$; males = $M=3.02$, $SD=0.60$; females = $M=2.89$, $SD=0.56$), and the reliability was $\alpha=.60$.

(c) *Health and risk questionnaire*. We focus on the same five items used previously: taking risks driving, car racing, speeding, taking risks biking, and driving under the influence. We first standardized the items before averaging them into a 'risky driving' scale ($\alpha=.64$). Speeding ($M=2.51$, $SD=0.93$) and taking risks driving ($M=1.65$, $SD=1.00$) were once again the most frequently reported behaviors, followed by taking risks biking ($M=0.62$, $SD=0.98$), car racing ($M=0.54$, $SD=0.91$), and then driving under the influence ($M=0.48$, $SD=0.83$). Once more, males reported more frequent risky driving (standardized $M=0.31$, $SD=0.76$) than females did (standardized $M=-0.18$, $SD=0.51$), $t(201)=-5.47$, $p<.01$).

(d) *Aggression questionnaire* (Buss & Perry, 1992). This questionnaire contains four subscales measuring physical aggression, verbal aggression, anger, and hostility. Participants responded to the 29 items by rating how characteristic each item was of themselves, where 1 = "extremely uncharacteristic" and 5 = "extremely characteristic." Examples of items are: "If somebody hits me, I hit back" (physical aggression); "I often find myself disagreeing with people" (verbal aggression); "I have trouble controlling my temper" (anger); and, "I sometimes feel that people are laughing at me behind my back" (hostility). The mean on this scale was 2.63 ($SD=0.58$), and males scored significantly higher than did females (males: $M=2.78$, $SD=0.59$; females: $M=2.55$, $SD=0.56$; $t(196)=-2.68$, $p<0.01$). The internal reliability was $\alpha=0.90$.

(e) *Consideration of future consequences (CFC)* (Strathman *et al.*, 1994). This questionnaire measures a "stable individual difference in the extent to which people consider distant vs immediate consequences of potential behaviors" (p. 742). Participants indicated their response on a 5-point scale, where 1 = "extremely uncharacteristic" and 5 = "extremely characteristic," to 12 statements, such as, "I consider how things might be in the future, and try to influence those things with my day to day behavior," and "I only act to satisfy immediate concerns, figuring the future will take care of itself" (reverse coded). The average score on the scale was 3.41 ($SD=0.57$), and males and females did not score differently on the CFC (unlike they did on the future scale of the ZTPI, on which females scored significantly higher than males). The internal reliability was $\alpha=0.78$.

(f) *Ego-control scale (VI) (EC)* (Block & Kremen, 1996). The EC scale contains 38 items, and participants responded by circling a number on a 4-point scale, where 1 = "not at all" and 4 = "very true." The scale is scored for *undercontrol*, and items include: "When I get bored, I like to stir up some excitement," "I do not always tell the truth," and "On the whole, I am a cautious person" (reverse coded). The average score was 2.57 ($SD=0.30$), and there were no gender differences on this scale. Its internal reliability was $\alpha=0.80$.

(g) *Impulse control*. The Impulse Control facet of the Big Five Questionnaire (Caprara, Barbaranelli, Borgogni & Perugini, 1993) assesses the ability to control irritation, discontent, and anger. The 12 items of this facet ($\alpha=0.72$) are rated on a 5-point scale from "very true of me" to "very false of me," and include questions such as, "I'm rather touchy," "It bothers me a lot to be disturbed when I'm doing something that interests me," and "I don't usually lose my calm" (reverse coded). The average score was 2.84 ($SD=0.52$), and there were no gender differences on this facet.

(h) *Novelty seeking* (NS) (Cloninger, 1987). The NS scale we used is a subscale of the Tri-dimensional Personality Questionnaire (TPQ), which measures three basic personality dimensions—Novelty Seeking, Harm Avoidance, and Reward Dependence. The NS scale measures "a tendency to be attracted to unfamiliar stimuli and is characterized by frequent exploratory activity and the avoidance of monotony" (Sher, Woods, Crews & Vandiver, 1995, p. 195). It contains 34 statements ($\alpha=0.79$), and participants indicate if the statements are true or false about themselves. The average score on this scale (summing all of the true statements) was 17.93 ($SD=5.73$), and there were no gender differences on this scale.

(i) *Preference for consistency scale* (PFC) (Cialdini *et al.*, 1995). The PFC scale (brief form) measures "a tendency to base one's responses to incoming stimuli on the implications of ... previous expectancies, commitments, and choices" (p. 318). Participants indicated the degree to which they agreed or disagreed with 9 statements on a 9-point scale where 1 = "strongly disagree" and 9 = "strongly agree" ($\alpha=0.81$). Statements include: "I typically prefer to do things the same way" and "It doesn't bother me much if my actions are inconsistent" (reverse coded). The average score on this scale was 5.61 ($SD=1.28$), and males and females did not respond differently.

(j) *Reward dependence* (RD) (Cloninger, 1987). The RD scale we used is a subscale of the TPQ. The RD scale, which is conceptually similar to delay of gratification, measures "extreme sensitivity to reward cues, particularly social approval, and greater resistance to extinction of behavior" (Sher *et al.*, 1995, p. 195). It contains 30 statements ($\alpha=0.71$), and participants indicate if the statements are true or false about themselves. The average score on this scale (summing all of the true statements) was 19.94 ($SD=4.31$), and females scored significantly higher than did males (females: $M=20.83$, $SD=3.98$; males: $M=18.13$, $SD=4.38$; $t(200)=4.45$, $p<0.01$).

(k) *Sensation seeking scale* (SSS) (Zuckerman, 1994). The average score for the SSS without the five problematic items was 52.46 ($SD=5.61$), and males reported insignificantly higher SSS scores than did females ($t(201)=-1.78$, $p=0.08$; males = $M=53.38$, $SD=5.36$; females = $M=51.91$, $SD=5.75$). The internal reliability was $\alpha=0.79$. Note that these means are quite similar to those obtained in Study 2 despite sample differences.

RESULTS

Overview

We first replicated the results from Studies 1 and 2, finding significant relationships between frequency of risky driving and extent of PTP. We next present results that suggest that time perspective is an important independent contributor to the prediction of risky driving even after controlling for the effects of nine different personality traits that have been related to risky driving or to some dimension of time perspective in previous studies.

Time perspective and frequency of risky driving

For the third independent replication, we again find support for our hypothesis, those who were more present-oriented reported more risky driving ($r(205)=.34$, $p<0.001$). In this sample, we also found the converse effect, as FTP increased, there was a significant decrease in risky driving ($r(205)=-0.25$, $p<0.01$). However, controlling for FTP did not substantially weaken the relationship between PTP and risky driving ($r(202)=0.29$, $p<0.01$). We can feel confident then in proposing that future and present time perspective are independent predictors of risky driving. A backward multiple regression was performed between the independent variables of: FTP, PTP, gender, and the interactions between gender and present, gender and future, and future and present, with risky driving as the dependent variable. Only PTP ($t(201)=4.94$, $p<0.01$) and gender ($t(201)=5.23$, $p<0.01$) were significant predictors of risky driving ($R^2=0.24$, $F(3,198)=20.33$, $p<0.01$), and the

interaction between gender and present time perspective added marginally to the model ($t(201)=1.75, p=0.08$), with present-oriented males again being more risk-seeking than females.

Discriminant validity

Refer to Table 4 for the complete listing of correlations between time perspective, the 9 variables against which we tested discriminant validity, and risky driving. The table also presents the disattenuated correlations between time perspective and the discriminant validity variables, to control for variations in scale reliabilities.

Even though the disattenuated correlations between time perspective and the variables of interest are high, we will see in the next section that PTP remains a significant predictor of risky driving when the overlap between time perspective and the discriminant validity variables are statistically controlled. All of the following analyses were conducted with the independent variables of: PTP, FTP, gender, and the interactions between gender and present, gender and future, future and present, along with each of the 9 discriminant validity variables of interest, with risky driving as the dependent variable. The following section will report in detail only those variables that emerged as significant predictors of risky driving in backward multiple regressions, and these variables are listed in alphabetical order after we show the replication for sensation seeking. The non-significant predictors of risky driving are listed subsequently.

Sensation seeking (SSS)

Both SSS and PTP contributed significantly to the model, with sensation seeking a statistically more important predictor of risky driving than was present time perspective (SSS: $t(201)=5.46, p<0.01$); (PTP: $t(201)=2.28, p<0.05$). Along with the effects of gender ($t(201)=5.11, p<0.01$), and the interaction between gender and present time perspective ($t(201)=2.25, p<0.05$), these variables accounted for 34% of the variance, $F(4,197)=24.90, p<0.01$.

Ego-control scale (EC)

Ego undercontrol was a strong, significant predictor of reported risky driving, and more so than was PTP ($R^2=.31, F(4,197)=22.08, p<0.01$; ego undercontrol: $t(201)=4.60, p<0.01$; PTP: ($t(201)=1.83, p=0.07$). Gender ($t(201)=5.50, p<0.01$) and the interaction between gender and PTP ($t(201)=1.79, p=0.08$) added to the predictive ability of the model.

This analysis challenges our assumption of the unique contribution of time perspective to the prediction of frequency of risky driving because PTP is only a marginal predictor compared to the effects of the EC scale. However, since both PTP and the interaction between PTP and gender are marginal predictors of risky driving, it might be shown that time perspective, between these two predictors, can still predict a significant portion of the risky driving variance. To test this suggestion, we first performed a multiple regression in which only ego control and gender were entered into the equation. This model accounted for 28.7% of the risky driving variance. We then performed a multiple regression in which ego control, gender, PTP, and the interaction between PTP and gender were entered into the equation. This model accounted for 31% of the variance. We then tested to see if the percentage of variance accounted for by the model containing the time perspective variables

Table 4. Correlations and disattenuated correlations between time perspective, discriminant validity variables, and risky driving

Scale	Risky Driving	Time perspective correlations		Disattenuated correlations	
		Future	Present	Future	Present
Future	-0.25***	-	-0.30***	-	-0.48***
Present	0.34***	-	-	-	-
Sensation seeking	0.45***	-0.24***	0.45***	-0.33***	0.65***
Ego undercontrol	0.42***	-0.28***	0.55***	-0.39***	0.79***
Preference for consistency	-0.32***	0.41***	-0.40***	0.57***	-0.57***
Aggression	0.26***	-0.24**	0.37***	-0.31***	0.50***
Consideration of future consequences	-0.23**	0.50***	-0.42***	0.70***	-0.61***
Family income	-0.05	0.06	-0.06	-	-
Impulse control	-0.18*	0.22***	-0.22***	0.32***	-0.33***
Novelty seeking	0.26***	-0.32***	0.47***	-0.45***	0.68***
Reward dependence	-0.20**	0.33***	-0.15*	0.49***	-0.23***

Note: * = $p<0.05$, ** = $p<0.01$, *** = $p<0.001$.

was significantly greater than the model without the time perspective variables. Indeed, it was. The F-statistic testing this question was significant ($F(2,194)=3.19, p<0.05$), indicating that the two time perspective variables accounted for a significant portion of the variance above and beyond the variance accounted for by ego control and gender.

Preference for consistency

Consistency and time perspective were both significant predictors of frequency of risky driving, accounting for 27% of the risky driving variance ($F(4,197)=18.06, p<0.01$). Present orientation was a somewhat more significant predictor of risky driving than was consistency (consistency: ($t(201)=-2.97, p<0.01$; present time perspective: ($t(201)=3.47, p<0.01$), and gender ($t(201)=5.20, p<0.01$), and the interaction between PTP and gender ($t(201)=1.73, p<0.10$) also added to the model.

Variables not predictive of risky driving

None of these scales were significant predictors of the risky driving scale: Aggression, Impulse Control, Novelty Seeking, Reward Dependence, nor Consideration of Future Consequences, or Family Income.

DISCUSSION

Most previous results were replicated in this final study: females are more future-oriented than males; males are marginally more present-oriented than females; males report more risky driving; speeding and taking risks driving are most highly reported, and the effects of PTP on risky driving are independent of any contribution of FTP. Before considering the comparisons between time perspective and the host of other relevant variables matched against it, the marginal gender effect on PTP needs mention. It appears that while both males and females from this sample scored higher on the PTP measure than was typical in Studies 1 and 2, females scored relatively higher and that is what minimized the gender difference. Also worth noting is the fact that the correlations between time perspective and risky driving were higher in this sample than in either of the earlier ones, being $r=.34$ for PTP and -0.25 for FTP.

Generally favorable results emerged from comparing the effects of our time perspective measures against those of a variety of other scales that have been related to risky driving, or to an alternative, more narrowly focused time scale. First, gender differences were found on only a few measures: males were more aggressive and somewhat higher on sensation seeking, while females were higher on reward dependence than males. Next, we highlight the set of variables which failed to show any relationship to risky driving. Nonsignificant predictors of risky driving include measures of: aggression, impulse control, novelty seeking, and reward dependence, as well as for Consideration of Future Consequences and family income. The CFC measure would appear to be similar to FTP, and does correlate significantly with it, but a low score on CFC is not the same as a high score on our PTP scale. The significant effects of both our time scales on risky driving, coupled with the absence of such effects for CFC, invites closer inspection of the content of those scales to determine what different psychological properties they are tapping.

Of the three measures that did predict risky driving, preference for consistency, PFC (Cialdini *et al.*, 1995) was surprising since it had not been associated previously with that outcome. In an earlier comparison, we found strong positive correlations with our measure of FTP and negative ones with PTP. In the current discriminant validity evaluation we found PTP to be a more important predictor of risky driving than PFC, but it is worth determining what aspects of this measure are responsible for its non-obvious links to risky driving.

As in Study 2, sensation seeking is an important predictor of risky driving. While PTP remains an independently significant predictor contributing to the model with SSS and gender, the statistical effect of SSS is greater than that of PTP. However, it is important to note that this combination of variables account for a substantial 34% of the variance in risky driving.

The strongest predictor of risky driving proved to be a new measure by Block and Kremen (1996) the Ego-Control Scale, EC. It is actually a measure of undercontrol or lack of ego control, and is a

composite of endorsing unconventional behavior, excitement seeking, and impulsivity. Although EC dominated the PTP scale in predicting risky driving, with additional statistical analysis, we showed that a significant portion of the variance in risky driving can still be predicted by PTP over and above that shown by EC. One might note that the 38 items on the EC scale have a much higher internal reliability than does our briefer 9 item PTP scale.

GENERAL DISCUSSION

The robust, consistent pattern of results reported across these three studies encourages us to conclude that time perspective is a significant and independent predictor of risky driving. Given the large and diverse samples of participants, the strength of the relationships uncovered, and the outcome of systematic comparisons with alternative individual differences measures, it is apparent that risky driving increases among those higher on present time perspective. Although weaker, there is also a significant, negative relationship between future-orientation and risky driving. These results are most powerful for our youngest sample of males.

While present time perspective, PTP, remained a significant predictor of risky driving when challenged by each of a multitude of alternative measures previously related to risky driving or to an alternative construct of psychological time (CFC), an ideal predictive composite includes PTP along with Ego Control (Block & Kremen, 1996), and Sensation Seeking (Zuckerman, 1994). These pairings account for about a third of the variance in reported risky driving. They clearly point to the importance of personality and individual difference measures in understanding the nature of this societal problem of risky drivers causing crashes and fatalities.

The vitality of time perspective

We are encouraged by the predictive utility of time perspective measures, especially as present time perspective relates to risky driving. Time perspective is a general psychological construct permeating much human motivation and decision making (Gonzalez & Zimbardo, 1985). It can be thought of as a unique cognitive style of processing information and acting based on a learned, preferred focus on one or another dimension of the temporal environment, past, present, or future. When that preference becomes chronic—the person typically uses only a narrow or biased temporal frame for dealing with the world—it then functions as a personality trait. However, this dispositional aspect of human functioning is modifiable by situational manipulations and contingencies (see Zimbardo *et al.*, 1971). Despite its overlap with a number of other individual difference variable, the ZTPI sustains a degree of independence and uniqueness from each of them. While most current research on time perspective is narrowly directed on only the future dimension by relating it to achievement motivation and anticipated action consequences (see Nuttin, 1985; Strathman *et al.*, 1994; Zaleski, 1994), the results reported here invite a broader inclusion of the importance of present along with future-orientation. Moreover, current research from our laboratory is revealing conditions under which a past orientation (positive or negative) also contributes in important ways to a fuller appreciation of complex human thought, feeling, and action. It is evident from the data in all three of our reported studies that the present and future time perspectives are conceptually distinct and not merely polar opposites, low levels on one are not isomorphic with high levels on the other. This functional differentiation of PTP and FTP can also be seen in companion research that reveals how PTP predicts substance use, alcohol, smoking and illegal drugs, while FTP does not (Keough *et al.*, under review). These two temporal perspectives are also related to host of other risk behaviors and health maintenance behaviors, with present-oriented individuals acting in more Dionysian fashion in contrast to the Apollonian futures, the former endorsing more libidinous behaviors, while the latter follow convention and social norms generally doing what is good, right, and proper (Zimbardo, Boyd & Keough, 1997).

The portrait of the risky driver

Our findings fit perfectly with a growing body of literature that characterizes those at greatest driver risk as: high risk takers in other areas, unconventional or somewhat deviant, mildly anti-social, impulsive, sensation seeking, overconfident in their driving ability, engrossed in the thrill of

the present moment, and male (see Burns & Wilde, 1995; Clement & Jonah, 1984; Donovan, Umlauf & Salzberg, 1988; Dorn & Matthews, 1995; Elander *et al.*, 1993; Furnham & Saipé, 1993; Gibbons & Gerrard, 1995; Loo, 1972; Matthews, Dorn & Glendon, 1991; West *et al.*, 1992; Williams & Jonah, 1985). Risky driving represents an interaction of driving skills and socially constructed attitudes, and may be influenced by improving these skills and changing these attitudes.

Since we have found that present time perspective increases the likelihood of substance use and abuse, there will be a synergistic interaction between drinking, risky driving habits, and impaired judgments that combine to elevate crash risk. Personality factors that minimize perceptions of one's state of fatigue, stress, anger, or degree of intoxication will lead to decisions to drive, or to continue driving, under risky conditions that increase chances of accidents. That risk is greater for males than females because they are higher on present-orientation, sensation seeking, and also drink more.

The need to reframe driver education

Risky driving causes crashes, crashes cause injuries and deaths, and the personal toll on those involved and the cumulative financial costs to society are considerable. We conclude with a call for new strategies of required driver education that take into consideration some of the psychological and behavioral factors we and others have shown impact on driver risk. Media campaigns against drunk driving have worked to lower the incidence of that traffic violation, as have campaigns to wear seat belts, but the focus needs to be widened considerably. Publicly emphasizing the specific practices that cost lives, such as speeding, reckless driving, not wearing safety belts, does save lives (Hingson, Howland, Schiavone & Damata, 1990). However, more sophisticated approaches are needed in intensive instruction in our schools to reframe the attention of adolescents on personal factors that contribute to their accident proneness. In addition to learning driving skills, they need to become aware of personally risky driving style tendencies that can be demonstrated as they engage in computer-simulated driving scenarios, some with friends beside them. In addition, they could benefit from other demonstrations of the ease of making faulty judgments, misperceptions, and using negative heuristics (e.g. lowered judgments of drunkenness as number of drinks increase). The goal here is to better calibrate their sense of personal confidence in various driving situations with reality constraints. Finally, it might help to have all potential drivers screened on a set of personality measures shown to predict risky driving, such as the PTP, EC, and SSS, and then make them sensitive to their risk status and potential to kill or be killed behind the wheel. Once beyond the controls and norms of such training facilities, driving is a self-regulated activity, therefore, all training must take into account the need to generalize key lessons from safe school settings to danger-laden traffic settings.

Driving is freedom to explore new places, it can be romantic, a sign of maturity, and more. But it is a privilege licensed by society whose vested interest is in the survival of its members. As such, societies need to experiment with and implement more effective approaches for driver training and education that recognize the central role of the kind of psycho-social variables shown to predict risky driving and to enhance the exercise of control through self-efficacy (Bandura, 1997).

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