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A multi-factorial framework for understanding reckless driving—appraisal indicators and perceived environmental determinants ☆

Orit Taubman - Ben-Ari [a,*], Mario Mikulincer [b], Amit Iram [c]

[a] *School of Social Work, Bar-Ilan University, Ramat Gan, Israel*
[b] *Department of Psychology, Bar-Ilan University, Ramat Gan, Israel*
[c] *Keshev—Thema Analysis, Israel*

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Abstract

The current study adopted an approach, in which reckless driving is perceived as related to both personal and environmental factors. Young drivers ($N = 295$) reported on reckless driving related threat and challenge appraisals, their perceived control over reckless driving, their disregard for negative consequences of this specific behavior, positive feedback received on their driving, environmental driving-climate and negative driving modeling. The dependent measure was self-reported frequency of reckless driving. Findings indicated that challenge and self-efficacy appraisals, along with negative environmental influences were related to higher frequency of risky driving, whereas threat appraisals, as well as positive feedback, were related to a lower frequency of reckless driving. In addition, whereas for men, self-efficacy in driving strongly predicted reckless driving, disregard for negative consequences was an important predictor for women. The results are discussed in view of an evaluating process of personal cognitive-emotional resources and environmental support proposed by Lazarus. Recommendations are made regarding the potential effectiveness of using positive appeals in prevention interventions.

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* Corresponding author. Tel.: +972 3 531 8066; fax: +972 3 534 7228.
E-mail address: taubman@mail.biu.ac.il (O.T. Ben-Ari).

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1. Introduction

In recent years, much theoretical and empirical effort has been invested in studying the psychosocial basis underlying reckless driving. Worldwide data reveal that car accidents are the leading cause for fatal injuries and death among adolescents and young adults (Department of Transport, 1990; Elander, West, & French, 1993; NHTSA, 2003), mainly among young men (Arnett, Offer, & Fine, 1997; Jonah, 1986). Evidence that young drivers are more likely to perform risky maneuvers or neglect precautions (Arnett et al., 1997; Evans & Wasielewski, 1983; Jonah, 1986) focused the attention of researchers on young drivers.

It has long been acknowledged that focusing on one or two factors that may contribute to reckless driving is not sufficient to investigate the multi-faceted nature of this phenomenon. Therefore, the multiple causality approach adopted in the current study follows an interactionistic tactic, in which such behavior is perceived as the result of both personal and environmental factors. In this respect, human behavior may stem not only from inherent personality traits or from environmental conditions, in which the individual lives and reacts to, but also from the way he/she subjectively perceives and interprets that environment (e.g., Lazarus, 1991). Hence, the current study examines the joint contribution of personal perceptions of reckless driving and its environmental determinants.

2. Cognitive appraisal

One basic personal factor that may underlie reckless driving is the way people appraise this behavior. Appraisal has been defined as involving the appreciation of a particular harm or benefit in the relationship with the environment (Lazarus, 1991). Initially used to relate to the realm of coping responses to stress, Lazarus and his colleagues (e.g., Folkman & Lazarus, 1985; Lazarus & Folkman, 1984) defined two basic kinds of appraisal—primary and secondary. Primary appraisal relates to whether something—positive or negative—of relevance to the person occurred, which might affect his/her social-image or self-esteem. Secondary appraisal relates to coping options, and the individual's evaluation of his/her available personal resources to cope with the situation.

One aspect of the primary appraisal defined by Lazarus and Folkman (1984) is that of threat appraisal, namely the person's beliefs that a transaction with the environment may endanger his/her well-being. With regard to driving, one can speak of the extent to which young drivers perceive reckless driving as dangerous and as a source for potential harm. Most studies of adolescents' cognitions reveal that they strongly believe in their own immunity and that their ability to perceive risk accurately is lower (Elkind, 1967, 1978; Finn & Bragg, 1986). One example is young drivers' tendency to rate themselves as more skillful and less likely to be engaged in an accident in comparison to their own age peers (Glendon, Dorn, Davies, Matthews, & Taylor, 1996; Matthews & Moran, 1986). Moreover, young men consider risky behaviors less serious and less

likely to result in an accident than did young women (DeJoy, 1992; Mundt, Ross, & Harrington, 1992). Millstein (1993) notes that since this tendency is not necessarily rationally based, it is essential to examine the individual's own perceived risk assessments and related appraisals in order to understand the way he/she thinks and reacts to reckless driving. We hypothesized that, high appraisals of threat in reckless driving would be related to less frequent risky driving behavior. In addition, we hypothesized that a tendency to neglect the negative consequences of risky driving would be related to a higher frequency of reckless driving. We also predicted that women will report on a higher appraisal of driving as a threat than men.

A complementary aspect of primary appraisal is the evaluation of the challenge involved in a transaction with the environment (Lazarus & Folkman, 1984). The driving literature reveals that motivations like competitiveness, sense of power and control, or just pursuing sensual pleasure may impinge on the way one drives and may influence a person's decision to drive recklessly (Evans, 1991). Drivers, especially males, often use vehicles to show-off, to attract attention or impress members of the opposite sex, to obtain excitement and to display competitive courage (Evans, 1991; Iram & Taubman, 1994). Vehicles are often used as an outlet for independence, emotional expression, rebelliousness, and to satisfy peer-acceptance needs of young drivers (Jessor, 1984, 1987). Sensation seeking and trait aggressiveness were found to be strongly related to risk taking in general and to reckless driving in particular among young men and less among young women (Arnett et al., 1997; Jonah, 1997; Kohler, 1996). Because the literature has shown that reckless driving may comprise several positive or challenging personal meanings for young drivers, we hypothesized that those who perceive reckless driving as a tool to obtain self and social benefits, or in other words—perceive reckless driving as a challenging experience—would report on higher frequency of reckless driving. In addition, we predicted that men will report on a higher appraisal of driving as a challenge than women.

Another kind of appraisal, which may account for individual differences in social behavior, is the extent to which one believes he/she can control what is happening in a transaction with the environment (Lazarus & Folkman, 1984). This control, or self-efficacy appraisal refers to whether and how a person perceives his/her ability to manage the demands of an encounter or to actualize personal commitments (Lazarus & Folkman, 1987). A review of the relevant literature seems to indicate that the extent of perceived control over reckless driving is an important factor involved in the decision whether to take risks during driving (Brown, 1986; Horswill & McKenna, 1999; Svenson, 1978). Studies have shown that young men use the car to enhance self-efficacy (Farrow & Brissing, 1990), and have a higher sense of driving competency in a variety of dangerous driving behaviors (DeJoy, 1992; McKenna, Stanier, & Lewis, 1991) more than young women. We thus hypothesized that perception of higher self-efficacy during driving will be related to more frequent risky driving. In addition, we predicted that men will perceive their driving self-efficacy as higher than women.

3. Environmental factors

The crucial part played by family and peers in moderating or encouraging risk behaviors has been pointed out in several studies (e.g., Baumrind, 1987; Ferguson, Williams, Chapline, Reinfurt, & De Leonardies, 2001; Horvath & Zuckerman, 1993; Irwin, 1990, 1993; Simmons & Bleyth,

1987). The psychosocial Problem-Behavior Theory (Jessor, 1984), for example, states that the perceived environment, together with the personality system and the behavioral system, act dynamically to generate a resultant normative transgression or problem-behavior, expressed in smoking, reckless driving, violence, etc. The perceived environment includes aspects of the social context and is related to social norms and expectations, sanctions and control, and exposure to particular models. Empirical findings indicate that lower parental support and control, lower social control, lower parent-friends compatibility, greater influence of friends than of parents, lower parental disapproval of problem-behavior, and more frequent exposure to models of problem-behavior are related to higher proneness to problem-behavior (Jessor & Jessor, 1977). Another theoretical model, the theory of planned behavior (Ajzen, 1985) holds that behavioral intentions are the function of three determinants: attitudes toward the behavior, subjective norms, and self-efficacy. Subjective norms are perceptions of social pressure to perform or not to perform a certain behavior. They are a function of normative beliefs that specific referent individuals or groups will approve or disapprove of the behavior, weighted by the motivation to comply with these referents. Applying this theory to reckless driving, Parker, Manstead, Stradling, and Reason (1992) found that drivers that feel that their referents would disapprove of their committing any of the violations, also report weaker intentions to commit the violations. Moreover, Ferguson et al. (2001) found that youngsters driving records in the first two years of licensure are related to their parents' driving records (crash involvement as well as traffic violations), and Taubman - Ben-Ari, Mikulincer, and Gillath (2003) found significant relationships between parents' and offspring's driving style.

Findings also emphasize environmental factors that may exclude such behaviors. For example, the presence of a parent in the car as a passenger was found to inhibit adolescents' reckless driving, whereas the presence of friends did not influence them to drive more recklessly than when they were alone (Arnett et al., 1997). In comparison to older drivers, younger drivers were found to perceive less pressure from others to abstain from committing driving violations and were also highly motivated to comply with the perceived wishes of their friends (Parker, Manstead, Stradling, Reason, & Baxter, 1992). Longitudinal-studies provide evidence that reported parental negative attitudes toward teen drinking at age 13 were inversely related to later involvement of youngsters in first-year driving crashes and offenses at age 17 (Shope, Waller, & Lang, 1996). Others, like Furby and Beyth-Marom (1992), argue that although adolescents may care very much what their peers think of them, it does not necessarily mean that their decisions about engaging in risky activities are heavily influenced by peers. We hypothesized that the perceived social environment is strongly related to youngsters driving behavior, so that young drivers might tend to imitate risky driving, be negatively influenced by risky-driving atmosphere, and be positively influenced by positive feedback of their parents and peers about their careful driving.

4. The current study

In view of the above outlines, we conducted the study in a sample of young Israeli drivers, who were asked to fill questionnaires to appraise threat and challenge of reckless driving, perceived control in reckless driving, perceived environmental driving climate, the presence of negative driving models, social feedback of their driving, and driving habits (the reported frequency of their reckless driving).

Studies in the past used various questionnaires to examine different aspects of reckless driving. For example, the Driving Style Questionnaire (DSQ, French, West, Elander, & Wilding, 1993) examines behaviors that had been shown to be related to accident involvement or risky driving behavior, such as, speed, gap acceptance (size of gap in the flow of traffic before attempting to pull out), and traffic light violations, as well as cognitions and attitudes that are supposed to be directly related to driving decision-making, such as feelings of control, route planning, and risk taking on the road. Another assessment procedure, the Driving Behavior Inventory (DBI, Gulian, Glendon, Matthews, Davies, & Debney, 1988; Gulian, Matthews, Glendon, Davies, & Debney, 1989), focuses on driving stress and taps dimensions of driving aggression, driving alertness, dislike of driving, general driver stress, irritation when overtaken, and frustration in overtaking. Yet, the Driver Behavior Questionnaire (DBQ, Reason, Manstead, Stradling, Baxter, & Campbell, 1990) examines errors made while driving, deliberate violations of normal safe driving practice, and harmless mistakes that result from inattention (lapses). These assessment procedures resulted in studies examining individual differences and predicting traffic violations and involvement in road accidents. The current study, however, takes another point of view, and tries to inspect sources for reckless driving adopting a theoretical psychological model. This rational has led us to use a list of driving behaviors as the dependent measure, trying to separate between driving behaviors and driving styles, and only predict reported driving behavior.

We examined the associations between perceptions of personal and environmental factors, on one hand, and the reported frequency of reckless driving on the other. In addition, we examined the associations among various personal and environmental factors related to reckless driving. Moreover, due to the importance of gender differences in driving styles in general and in reckless driving in particular (DeJoy, 1992; Drummond & Yeo, 1992; Elander et al., 1993; Evans, 1991; Farrow & Brissing, 1990; Harré, 2000; Kohler, 1996; Massie, Green, & Campbell, 1997; Mercer, 1989; Simon & Corbet, 1996; Taubman - Ben-Ari, Mikulincer, & Gillath, 2004), we examined whether these differences moderate the contribution of the assessed personal and environmental factors to reckless driving. Finally, since previous studies have generally failed to take into account driving exposure (annual mileage or weekly driving hours), which has been found to be related to accident rates and to propensity to drive fast (e.g., French et al., 1993; Quimby, Maycock, Carter, Dixon, & Wall, 1986), we controlled for variations in weekly driving hours while examining the above associations.

In sum, we hypothesized that reports of reckless driving would be positively related to (a) challenge perception of reckless driving, (b) neglect of the negative consequences of risky driving, (c) perception of self-efficacy and control over reckless driving, (d) reckless driving of family and friends, and (e) risky-driving atmosphere in the social environment. In addition, reports of reckless driving would be negatively related to (a) threat perception of reckless driving, and (b) positive feedback from parents and peers about driving.

Additionally, there is accumulative evidence that young men attach more positive meaning to driving (Stoddart, 1987), use the vehicles more to enhance self-esteem and self-worth (Taubman - Ben-Ari, Florian, & Mikulincer, 1999), tend to be more confident about their driving skills, feel more self-efficient while driving (DeJoy, 1992; Farrow & Brissing, 1990), and tend to be less anxious about crashes (Barjonet, 1988). Thus, we also predicted that young male drivers will perceive driving as more challenging, will feel more self-efficacious while driving, will tend to disregard potential negative outcomes, and will tend to be exposed to more negative environments, in

comparison to women. In contrast, young female drivers will perceive driving as more threatening, and will tend to receive higher positive feedback regarding their driving from their surroundings, in comparison to men.

5. Method

Participants. Two-hundred and ninety-five (152 males and 143 females) combat and service soldiers in compulsory service of the Israeli Defense Forces (IDF), were selected from different army units. [1] Their age ranged from 18 to 21 (mean age—19). The soldiers participated in the study without reward. The only criteria for inclusion in the study were possession of a driving license and at least one year of driving experience.

Materials and procedure. Data were collected individually in soldiers' respective units. Participants' consent was received after they were told that they will take part in an anonymous study on social attitudes towards a wide variety of topics, including their thoughts and feelings towards driving.

Following the above general instructions, participants completed several questionnaires, which were presented in a random order among them:

5.1. Reckless Driving Habits Scale

In order to examine the reported frequency of reckless driving, a list of 14 typical driving behaviors was constructed. All of them were legal felonies, most of which could endanger the driver and/or his/her passengers' life or well-being, or the life of drivers and passengers in other cars (see Appendix A). Participants were asked to read each item carefully and report how often they used to drive according to the described way. These ratings were made on a 6-point scale, ranging from 1 (''never'') to 6 (''always''). The Cronbach's Alpha coefficient for the 14 items was high (.85). On this basis, we averaged the 14 items into a total score, with higher scores reflecting higher frequency of reckless driving.

5.2. Threat appraisal of reckless driving scale

In order to assess the appraisal of reckless driving as a threat, we examined three subjective evaluations: The extent that participant evaluated legal felonies as risky driving behaviors; The extent he/she believed such driving behaviors might lead to car accidents; and the anxiety aroused while committing these behaviors. Participants received the above list of 14 driving behaviors 3 times, each time they related to one of the above mentioned evaluations. Thus, the participants were asked to rate each item: (a) to what extent does he/she believe that this behavior is dangerous while driving? (b) to what extent does he/she think that this behavior can cause an accident? and

[1] Most youngsters aged 18–21 in Israel, serve the IDF, which is a compulsory military service. The participants in the current study were asked to relate to driving in non-army vehicles. In fact, for the most part, they do not have access to army vehicles.

(c) to what extent does he/she feel anxiety, concern or stress while committing this behavior? These ratings were made on a 6-point scale, ranging from 1 (''not at all'') to 6 (''very much''). The Cronbach's Alpha coefficients for the 14 items were high (.91, .92, .93, respectively). On this basis, we averaged each group of 14 items into one total score. Pearson correlations between the three scores were significant and high (.54–.65), indicating that they all tapped similar meanings. In addition, the Cronbach's Alpha coefficient for the three scores was adequate (.70). Therefore, a global score of threat appraisal was calculated—higher scores reflecting higher assessment of reckless driving as a threat.

5.3. Challenge appraisal of reckless driving scale

In order to assess the challenge appraisal of reckless driving, participants received the same list of 14 driving behaviors, and asked to rate the extent they experienced challenge, excitement, or pleasure upon committing these driving behaviors. These ratings were made on a 6-point scale, ranging from 1 (''not at all'') to 6 (''very much''). The Cronbach's Alpha coefficient for the 14 items was high (.94). On this basis, we averaged the 14 items into one total score, expressing the subjective challenge appraisal—higher scores reflecting higher assessment of reckless driving as a challenge.

5.4. Self-efficacy appraisal of reckless driving scale

In order to assess the perceived self-efficacy of the participants during reckless driving, we examined two subjective evaluations: The extent the participants evaluated themselves as controlling the above 14 driving behaviors, and self confidence while committing these behaviors. The participants received the list twice, each time they related to one of the above evaluations. These ratings were made on a 6-point scale, ranging from 1 (''not at all'') to 6 (''very much''). The Cronbach's Alpha coefficients for the 14 items were high (.93, .94, respectively). On this basis, we averaged each group of 14 items into a total score. Pearson correlation between these two scores was significant and high (.57), indicating that they tapped similar meanings. Therefore, we averaged these scores into a global score of self-efficacy appraisal—higher scores reflecting a higher degree of assessing control over reckless driving.

5.5. Disregard for negative consequences scale

In order to appraise this variable, participants received the above mentioned list of 14 driving behaviors, two times, each time accompanied by another specific question. The participants were asked to rate for each behavior item (a) to what extent does he/she believe there is a chance that committing this behavior would lead to negative consequences? and (b) to what extent does he/she consider possible negative consequences, when he/she has to decide whether to employ this behavior? These ratings were made on a 6-point scale, ranging from 1 (''not at all'') to 6 (''very much''). Disregard for negative consequences was expressed as the difference between admitting possible negative outcomes and the decision to consider them. Therefore, high disregard would exist when the individual assessed that there was a high chance for negative consequences as a result of reckless driving, while he/she actually did not consider them while driving. The Cronbach's Alpha

coefficient for the 14 new scores was high (.92). On this basis, we averaged the 14 calculated scores into a total score, which represents disregard for negative consequences—higher scores reflecting higher degree of neglecting possible negative outcomes of reckless driving.

5.6. Modeling

In order to examine the influence of environmental modeling, we identified three specific groups: the army unit, family members and friends. Therefore, participants were asked to rate the frequency of each of the 14 driving behaviors among: (a) peer soldiers in their unit; (b) family members; and (c) friends. Responses were given on a 6-point scale, ranging from 1 (''not at all'') to 6 (''very often''). The Cronbach's Alpha coefficients for the 14 items were high (.90, .97, .95, respectively). On this basis, we averaged each group of 14 items into a total score—higher scores reflecting higher degree of reckless driving modeling in various environments. Pearson correlations between the three scores were significant and moderate (.34–.39), indicating similar meanings. In addition, the Cronbach's Alpha coefficient for the three scores was adequate (.70). Therefore, we averaged them into one global score of the frequencies of reckless driving in the subject's environment—higher scores indicating higher reckless driving modeling.

5.7. Negative environmental climate

In order to examine the environmental climate that encourages reckless driving, we identified four specific environments: the army unit, family members, same-gender friends, and opposite-gender friends. To appraise negative unit climate participant received a questionnaire containing 11 items, based on Zohar's (1980) organizational climate scale (partially used previously by the IDF Behavioral Science Unit), which was adjusted to address reckless driving issues (see Appendix B). The questionnaire included items regarding perceived management attitudes toward safety in driving, perceived reasons for driving carefully by other unit soldiers, and perceived effects of safe conduct regarding driving on social status and on social image. Participants were asked to rate the suitability of each of the 11 items to the reality of their unit. Responses were given on a 5-point scale, ranging from 1 (''not at all'') to 5 (''very much''). The Cronbach's Alpha coefficient for the 11 items was high (.93). On this basis, we averaged the items into one total score—higher scores reflecting higher degree of army unit-safety-driving climate.

For each of the other environments, we adopted a questionnaire previously used by Yinon (1993), in which participants were requested to point out whether family members/friends of the same gender/friends of the opposite gender encourage them to: (a) drive at a high speed; (b) violate traffic rules; and (c) take risks while driving. The answers given were ''yes'' or ''no''. The Cronbach's Alpha coefficients for the 3 items in each environment were adequate (.77, .80, .71, for the family, same gender friends and opposite gender friends, respectively). On this basis, we summed up each group of three items into one total score. Pearson correlations between the four environments (army unit, family, friends from the same or the opposite gender) were significant and moderate (.30–.45). In addition, the Cronbach's Alpha coefficient for the four scores was adequate (.67). Thus, we averaged all of them into a global score of negative environmental climate. Higher scores indicated higher environmental encouragement to drive recklessly.

5.8. Positive feedback regarding driving

In order to examine received positive feedback on the quality of driving, we related to three specific environments: family, same-gender friends, and opposite-gender friends. Participants were asked whether family members/ same-gender friends/ opposite-gender friends (a) give positive evaluations regarding your driving? and (b) give negative evaluations regarding your driving? The answers were "yes" or "no". Positive feedback score was calculated by subtracting the negative evaluation from the positive one. Higher scores indicated higher positive feedback regarding driving. Pearson correlations between these three calculated scores were significant and quite high (.45–.50), indicating that the three scores tap similar meanings. In addition, the Cronbach's Alpha coefficient for the three scores was adequate (.73). Therefore, we calculated the mean value of all the scores into a global score. Higher score represents a more positive feedback of the close environment to the participant on his/her driving.

6. Results

6.1. Relationship among cognitive appraisals and environmental determinants

We first examined the relationship between the different types of cognitive appraisals: assessing reckless driving as a threat, assessing it as a challenge, evaluating self-efficacy while driving recklessly, and disregard for possible negative consequences of reckless driving. Pearson correlations between these variables revealed that threat appraisal was negatively related to challenge appraisal and to self-efficacy appraisal ($r = -.18, -.30$, $p < .01$, respectively). Thus, the more the individual perceived risky driving as threatening, the less he/she assessed it as challenging, and the less he/she perceived him/herself as having control over it. Perceiving self-efficacy in reckless driving was positively related to perceiving it as a challenge ($r = .21$, $p < .01$). That is, the more competence a person feels about him/her driving ability, the more she/he perceives driving as a challenge.

In the next step, we examined the associations between different sources of environmental influences: modeling (frequency of reckless driving among different environmental influences, like family members, friends and army-unit peers), negative environmental climate (perceived environmental encouragement to take driving risks) and positive feedback on driving. Pearson correlations indicated that modeling was positively related to negative driving climate ($r = .31$, $p < .01$), whereas this climate was also negatively related to positive feedback ($r = -.17$, $p < .01$). Thus, the more the participant reported a high frequency of reckless driving among family and friends, the more he/she reported that his/her environment encouraged him/her to drive recklessly, and the more the environment did that, the less he/she received positive feedback regarding his/her driving.

Then, we examined the associations between the different sources of environmental influences and the various cognitive appraisals. Pearson correlations between these variables indicated that perceiving reckless driving as a threat was related to all three sources of environmental influences on driving. On one hand, this appraisal was negatively related to modeling and to negative driving climate ($r = -.23, -.23$, $p < .01$, respectively), and on the other, it was positively related to receiving a positive feedback ($r = .16$, $p < .01$). Thus, the more the subject perceived reckless driving as a

threat, the less he/she reported reckless driving models in his/her environment, the less he/she assessed driving climate as negative, and the more positive feedback he/she received for his/her driving.

Perceiving reckless driving as a challenge was positively related to modeling and to a negative climate ($r = .32, .27$, $p < .01$, respectively), whereas self-efficacy appraisals were negatively related to positive feedback ($r = -.15$, $p < .01$). Thus, higher perception of reckless driving as a challenge was related to higher assessment of negative modeling and environmental climate. Drivers that are more self-confident receive less positive feedback regarding their driving.

Disregarding consequences of reckless driving was positively related to modeling and to negative climate ($r = .18, .21$, $p < .01$, respectively), but negatively related to positive feedback ($r = -.16$, $p < .01$). Thus, higher disregard for the negative consequences of reckless driving was related to higher assessment of negative modeling and environmental climate, and to lower positive feedback.

6.2. Gender differences

In the next step, we examined gender differences in frequency of reckless driving reports on one hand, and personal and environmental factors on the other. Table 1 shows means, standard deviations and *t*-test scores for differences in the reported frequency of reckless driving, cognitive appraisals and perceived environmental sources between men and women.

The *t*-tests indicated significant differences between men and women in the frequency of reckless driving, as well as in appraising such driving as a threat and as a challenge, and in all the environmental sources. Namely, as expected, men tended to report a higher frequency of reckless driving, assessed it as less threatening and more challenging, reported a higher frequency of risky driving among family and friends, indicated a more negative driving environment, and less positive feedback about the quality of their driving than women. The same gender differences were obtained after controlling for weekly mileage (as a covariate in a series of ANOVAs).

Table 1
T-test scores, means and standard deviations for reckless driving and the predictive factors among men and women

	Men		Women		*t*
	M	SD	M	SD	
Frequency of reckless driving	1.94	0.63	1.62	0.41	5.01**
Threat appraisal	4.51	0.79	4.84	0.65	3.86**
Challenge appraisal	1.93	1.07	1.45	0.61	4.69**
Self-efficacy	2.93	1.04	2.78	1.15	1.19
Disregard for negative Consequences	0.03	0.98	0.18	0.76	1.45
Modeling	2.52	0.97	2.24	0.78	2.67**
Negative climate	0.73	0.64	0.59	0.49	2.21*
Positive feedback	0.34	0.50	0.47	0.51	2.17*

* $p < .05$.
** $p < .01$.

6.3. The predictive contribution of cognitive appraisals and environmental determinants to reckless driving

At this stage we examined the contribution of the personal and environmental factors to the frequency of risky driving. Pearson correlations revealed that the 7 factors were significantly correlated with reckless driving, hence, as predicted, higher evaluation of risky driving as threatening and more positive feedback regarding the quality of driving were related to lower tendency to report reckless driving (r's = −.45,−.26, $p < .01$, respectively). On the other hand, challenge as well as self-efficacy, disregard for negative outcomes, modeling, and negative environmental climate appraisals, were positively related to reckless driving (r's = .24, .33, .13, .37, .19, $p < .01$, respectively). Thus, those evaluating driving as a greater challenge, perceived their self-efficacy during driving situations as higher, showed more disregard for negative consequences, reported higher frequency of reckless driving in their social environment, and on being encouraged to drive recklessly, also reported a tendency to drive recklessly more frequently.

In the next step, we conducted a two-step hierarchical regression for the prediction of reckless driving. In this regression, we examined the unique effects of hours driven per week (exposure rate), gender, and the study's cognitive-personal and environmental variables, and the interactive effects between gender and each of the cognitive and environmental variables. Examination of the independent variables, indicated that they are only mildly correlated (r's = .15 −.32), thus there is no threat of collinearity between them. In step 1 of the regression, we introduced all the independent variables: weekly hours, gender (a dummy variable), threat, challenge, self-efficacy, disregard, modeling, negative climate and positive feedback as the predictors and examined their unique contributions. In step 2, we added the two-way interactive term (gender X each of the study's variables), using a step-wise procedure. Table 2 presents regression coefficients for the prediction of reckless driving.

Table 2
Hierarchical regression coefficients (beta weights) for the frequency of reckless driving

	Step 1 Beta	Step 2 Beta	Step 3 Beta
Weekly driving hours	−.08	−.07	−.06
Gender	.18***	.19***	.19***
Threat appraisal	−.29***	−.26***	−.25***
Challenge appraisal	−.07	−.07	−.06
Self-efficacy	.21***	−.21	−.22
Disregard for negative consequences	.10	.09	.54**
Modeling	.23***	.24***	.23***
Negative climate	−.03	−.03	−.02
Positive feedback	−.12*	−.14	−.14**
Gender X self-efficacy		.45***	.47***
Gender X disregard for negative consequences			−.47***
F	17.53***	17.06***	16.38***
R (**2)	39.8	41.7	43.2

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

The regression analysis revealed that the 9 factors significantly predicted the reported frequency of reckless driving, $F(11,237) = 16.38$, $p < .001$, and explained 43.2% of its variance. Only five factors had a unique predictive contribution in step 1: gender, threat appraisal, self-efficacy, modeling, and positive feedback. In other words, the regression analysis revealed two important factors, which inhibit reckless driving—assessing reckless driving as a threat and receiving a positive feedback, and two factors that seem to accelerate risky driving—self-efficacy and high frequency of reckless driving among family and friends. In addition it indicated the major role that a person's gender plays in predicting reckless driving. Moreover, in step 2, two interactions significantly predicted reckless driving, namely, the interaction between gender and self-efficacy, and the interaction between gender and disregard for negative consequences.

Examination of the sources of the significant interactions yielded results fitting our predictions concerning gender. Pearson correlation between self-efficacy and reckless driving revealed that self-efficacy was significantly, positively and quite strongly related to reckless driving for men ($r = .42$, $p < .001$). However, they were significantly, positively and quite weakly related for women ($r = .20$, $p < .05$). A Fisher Z test revealed a significant difference between the genders in the strength of the obtained correlations ($Z = 2.12$, $p < .05$). Pearson correlation between disregard for negative outcomes and reckless driving revealed that disregard was not related to reckless driving for men ($r = .08$, $p > .05$). However, they were significantly and positively associated for women ($r = .32$, $p < .001$). A Fisher Z test revealed a significant difference between the genders in the strength of the obtained correlations ($Z = 2.10$, $p < .05$).

7. Discussion

In the present study we attempted to provide new empirical evidence that a combination of personal and environmental variables seems to be related to reckless driving, by using a multi-factor framework. The findings shed light on the relationship between subjective appraisals of threat and challenge of reckless-driving, along with the personal belief in self-efficacy during reckless driving, a tendency to neglect potential negative outcomes, and three environmental sources—a negative driving climate, a high frequency of adverse modeling of risky behavior, and a positive feedback regarding driving.

Our predictions were supported in the current study, indicating factors that inhibit reckless driving, as well as factors that encourage reckless driving. The findings show that on one hand perceiving reckless driving as a threat inhibits risky driving and that positive feedback from family and friends about one's driving style acts as an environmental inhibitor. On the other hand, perceiving reckless driving as a challenge and believing that one is capable of coping successfully with its demands, combined with disregard for its possible negative outcomes, and perceived negative environmental sources, strengthened the tendency to drive recklessly.

Interpretation of the current data, indicates that the only personal factor that inhibits reckless driving is threat appraisal. That is, perceiving reckless driving as a risk to oneself, may prevent a person from actually committing it. Contrary is the perception of reckless driving as a challenge, along with a belief in having suitable inner resources to handle it. This tendency is strengthened even more by disregarding potential negative consequences of such behavior.

It is possible that young drivers adopt a present time orientation regarding reckless driving, concentrating on the pleasure and fun, and tending to ignore possible future outcomes of their behavior even though, rationally, they know it is risky, and might endanger their life and the life of others. The immediate temptation seems to override the existing learned knowledge of what might be the result of reckless driving, probably due to their strong feeling of control over the situation. Accordingly, external sources, which lend a model and encourage reckless driving further contribute to this dynamics. Not only are the negative environmental determinants related to habits of reckless driving, but they are also associated with personal perceptions of reckless driving, assessing it as challenging, and disregarding its potential outcomes. Even though in the present study we measured only the perceived environmental factors, it is still important to understand how strongly it affects one's decisions regarding his/her preferred driving style.

In accordance with previous studies (e.g., Barjonet, 1988; DeJoy, 1992; Farrow & Brissing, 1990; Stoddart, 1987), we found important gender differences. Firstly, young men report higher frequency of taking driving risks than women. Secondly, unlike women, men tend to perceive reckless driving as a challenge rather than a threat, as well as to be more influenced by an environment that presents negative models and encourages risky driving. Thirdly, in trying to predict reckless driving, it seems that whereas men tend to drive recklessly because of their belief that they can handle reckless driving efficiently, women tend to drive recklessly because they disregard potential negative outcomes of their behavior. These findings suggest that men and women use different ways to appraise reckless driving, which may in turn lead them to be involved in different kinds of accidents (e.g., Elander et al., 1993; Storie, 1977).

By attempting to combine several personal and environmental sources, which together may contribute to or inhibit the decision to drive recklessly, the present study made a step forward in studying reckless driving. We would like to suggest the use of a global psychological theoretical framework, namely Lazarus and Folkman's model (1984), which may contribute to the holism of the suggested model to explain reckless driving. In employing this model, reckless driving can be thought of as a result of a cognitive process, beginning with a primary perception of its being a challenge or a threat, continuing with an evaluation of available personal resources to cope with the demands of the task and the psychological anticipation regarding its outcomes (negative vs. positive), and a combination of environmental influences that contribute (encourage or discourage) to the decision whether to drive carefully or recklessly. We believe that in the future this theoretical model might help to predict how people may behave in situations of reckless driving.

A note of caution is required before making any conclusive generalization from the current findings. First, all the data are based on self-report measures, which may lead to increased likelihood of inter-correlations among the measured constructs and to potential self-serving biases. It would have been better to rely, at least partly, on objective (e.g., observational) data, or on multi-agent reports (e.g., family members and friends). Second, all the participants were youngsters in compulsory military service in Israel. Although the study of reckless driving is most relevant for young drivers, and most of the Israeli youngsters serve the army, future research should attempt to replicate our study by using different age and cultural groups. Third, all measures were collected at the same point in time. Future studies should tempt to use longitudinal research settings to allow an examination of developmental aspects of reckless driving. Fourth, our dependent variable was the frequency of reckless driving behaviors. Future studies should try to adopt other measures, such as driver behavior (DBQ, Reason et al., 1990) or driving style (MDSI,

Taubman - Ben-Ari et al., 2004), or records of car accident involvement, to study the associations between personal and environmental aspects of driving risk taking. Finally, though the presented model accounted for almost half of the explained variance of reckless driving, it nevertheless indicates that other factors, which were beyond the scope of the present study, should be searched to fully comprehend reckless driving. Such factors might be internal resources, such as personality traits, or external sources such as the media.

Lastly, practical recommendations may be implemented in view of the above findings. One is related to the feeling of self-efficacy, which is strongly associated with reckless driving, and is especially common among young men. This illusion of control over reckless driving is often strengthened by the common experience of committing reckless driving without meeting any of its horrible potential consequences. It seems that interventions should convert the goals youngsters try to achieve while driving. If the good feeling earned through driving is of a competent driver, that can maneuver the vehicle and its passengers as he/she wants, then one should be led to achieve these positive sensations through enhancement of values such as social and personal responsibility, to their own life and to the life of others. In other words, an attempt to divert the need to enhance young drivers' self-efficacy by showing off and driving recklessly into showing off by saving the life of their friends and family may become a key concept in future educational prevention programs. The message should be that a real competence is reflected by bringing all your friends safely home.

The second recommendation relates to the cue given in this study of the valuable contribution of a positive act, such as an encouraging feedback regarding driving. This finding is coherent with previous results, which showed—using an experimental design—that the introduction of positive self-enhancing feedback after a mortality salience induction, which served as an external source for self-esteem enhancement, allowed people to defend against the terror of their own death, reducing the increased rate of reckless driving found previously (Taubman - Ben-Ari et al., 1999).

Combining these two findings, it seems that interventions should use more positive appeals, that empower the youngsters' self-image as responsible drivers, to help reduce the levels of reckless driving. Because describing the dangerous consequences of reckless driving were found to be known but neglected, threat appeals might be left unnoticed. However, a positive, friendly, non-authoritative appeal which calls for a community enlistment to achieve shared goals, might enable to moderate the driving risks young people take so willingly.

Appendix A. The list of driving behaviors

1. Driving trough red light.
2. Parking in a non-parking zone.
3. Driving at a higher speed than allowed.
4. Not stopping in a "stop" sign.
5. Driving when tired.
6. Not obeying a "slow down" sign.
7. Overtaking another vehicle on a continuous white line (no pass zone).
8. Not keeping the right distance from the vehicle in front of me.
9. Not looking at the side mirrors while overtaking.

10. Driving slowly in a highway.
11. Entering a street with a ''no entry'' sign.
12. Not using seat-belts.
13. Driving under the influence of alcohol.
14. Turning in high speed.

Appendix B. Army Unit's Negative-Safety-Climate Scale

1. In my platoon, keeping safe driving rules is considered a nuisance.
2. In my platoon, soldiers are driving carefully only out of fear of being punished.
3. In my platoon, commanders keep safe driving rules only in order to cover themselves from being responsible.
4. My commander gives easily up safety rules in order to commit tasks in a better mode.
5. In my platoon, those who drive in high speeds are more socially accepted.
6. Usually, those who talk about safety in my unit are not really driving safely.
7. In my platoon, safe driving is less kept when in time pressure.
8. My unit colleagues make jokes on my account when they think that I drive too slowly.
9. Keeping safety rules while driving is done only out of fear from being caught.
10. In my unit, there is a considerable gap between what is said and what is done concerning road safety.
11. My unit colleagues disparage those who drive carefully.

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