

PERSPECTIVE-TAKING, PERSONALITY, DRIVING BEHAVIOR, AND THEIR RELATIONSHIP TO RISK PERCEPTION IN TRAFFIC SITUATIONS

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ABSTRACT

Traffic accidents remain a serious global issue, and human factors are recognized as important contributors to the issue. Perspective-taking has shown positive outcomes in various social domains and has also received some attention in traffic psychology research. Studies suggest that lower perspective-taking levels are related to higher antisocial behavior in traffic contexts. Additionally, individuals with experience across multiple modes of transportation tend to be less involved in traffic accidents, an effect partially attributed to increased perspective-taking. The main aim was to examine whether perspective-taking is related to traffic situation evaluations, mainly in terms of risk perception and outcome prediction. A secondary aim was to investigate whether personality traits, dark triad traits, self-reported driving behavior, and demographic variables mediate the relationship between perspective-taking, risk perception, and outcome prediction. Two studies were conducted. Study 1 employed a cross-sectional design while study 2 replicated this design and included order manipulation to test whether considering perspective-taking beforehand would influence risk perception and traffic outcome prediction. In both studies participants evaluated traffic situation videos. The results did not reveal any significant effects of perspective-taking on video evaluations, except for confidence in one's evaluations. However, dark triad traits and self-reported driving behavior were significantly associated with traffic situation perception evaluations.

Keywords: dark triad traits, personality traits, perspective-taking, risk perception, traffic psychology

Introduction

Traffic accidents and fatalities are of great concern in Europe. In 2022 it was reported that more than 20 thousand people lost their lives in traffic related accidents (Directorate-General for Mobility and Transport, 2023). Estimates have been made that close to a half (41%) of all traffic accidents are associated with human related factors (Yaacob et al., 2018).

Traffic environment can require inquiring into other traffic agent mental states, where perspective-taking plays a key role (Sheppard et al., 2010). Additionally, people in

general tend to be egocentric in their thinking, that is people often assume that others' opinions, experiences, perceptions and other psychological processes will be like their own (e.g., Dunning & Hayes, 1996). Thus, perspective-taking could act to diminish this egocentric tendency. As well perspective-taking has been linked to various positive outcomes: improved social coordination (Galinsky et al., 2008), reduced prejudice expression (Galinsky & Moskowitz, 2000), higher motivation to engage in prosocial behavior (Batson et al., 2002), which all could be beneficial in traffic situations.

Perspective-taking and Risk Perception

Perspective-taking is defined as the ability to imagine the viewpoint of another person (Epley & Caruso, 2012). Perspective-taking can further be subdivided into three distinct types: perceptual or visuospatial, cognitive, and affective perspective-taking (Enright & Lapsley, 1980). All perspective-taking types rely on the same abilities: (a) ability to realize that other social agents have mental states, (b) realization that these mental states could be different than one's own, (c) the ability to overcome one's inner egocentrism in favor of these other states (Mohr et al., 2007). In traffic contexts perspective-taking could play an important role, because a large proportion of traffic situations require one to correctly assess the spatial relationships between different traffic agents and what elements of the traffic situation are visible to different traffic agents and thus to anticipate the behavior of these agents correctly (Nakai & Usui, 2017).

Traffic situations entail many aspects, of which one is inherently social. A lot of situations on the road require interaction between multiple traffic agents, whereby for efficient interactions one needs to be able to make somewhat accurate assessments of the intentions of other road users and to be able to predict the potential actions of these other users (Sheppard et al., 2010). Just measuring the act of taking others into account shows positive effects. For example, a study by Austers and colleagues (2025) found that individual differences in perspective-taking when in traffic situations are associated with lower self-reported violations, and one's readiness for others' mistakes in traffic situations is associated with lower self-reported lapses and errors.

Some indirect evidence exists where people with experience across multiple different transportation modes show less traffic accident involvement concerning the modes of transport, they have experience with (Nakai & Usui, 2017). Nakai and Usui (2017) found that having a license of another transportation mode (e.g. motorcycle) was related to safer behavior towards that transportation mode when using a different mode of transportation. They argued that this result could be explained by the participants' increased ability to understand the perspective of the other mode of transportation better because of their own experience with it. Another study exposed drivers to videos filmed from the motorcyclist's perspective found decreased negative attitudes and increased safer attitudes towards motorcyclists (Shahar et al., 2011). In a couple of simulation studies, using a simulated driving game to see if perspective-taking was related to prosocial behavior on the road, showed that lower perspective-taking levels were associated with higher anti-social driving behavior (e.g. not trying to avoid pedestrians; Ju et al., 2016; Uijong et al., 2019). Finally, a study (Dimdiņš et al., manuscript under review) directly manipulating

perspective-taking, found a very minor effect on increased risk perceptions of traffic situations. The same study found a stronger positive link between individual differences in perspective-taking and risk perception.

The present study

The main objective of this study is to understand whether individual differences in perspective-taking and manipulated perspective-taking can predict differences in traffic risk perception and outcome prediction.

To measure perspective-taking specifically in traffic context we used the Driver Situational Reflection Scale (DSRS; Austers et al., 2025). DSRS was chosen because it was developed specifically for traffic context. The scale is comprised of two subscales – (1) perspective-taking and (2) caution. Whereas perspective-taking measures the driver's tendency to reflect on other traffic members' point of view whilst driving, the caution scale measures one's readiness to react and consider other potentially unexpected situations. Both subscales show good internal reliability (above .8) in the original study and its content validity has been shown by the developing authors (Austers et al., 2025).

Additionally, we added various individual difference measures. Research shows that individual differences account for variability in driving behavior. For example, meta-analytical studies (e.g. Akbari et al., 2019; Luo et al., 2023) find that various big five traits relate to risky driving behavior. In addition, more deviant personality traits such as the dark triad traits have been shown to relate to risky driving. Dark triad traits in general can be described as self-serving, manipulative, and characterized by emotional detachment and aggressiveness. Dark triad traits include three subcategories – narcissism, psychopathy, and machiavellianism (Paulhus & Williams, 2002). In traffic context dark triad traits as well have shown links to riskier driving (Endriulaitienė et al., 2018) and aggressive driving (Burtäverde et al., 2016).

Finally, self-reported driving behavior and specifically measured via the driving behavior questionnaire (DBQ; Reason et al., 1990) has consistently been linked to various driving outcomes such as traffic accidents (e.g. Oluwadiya et al., 2020; Singh & Kathuria, 2023), erratic driving patterns, whereas lapses subscale showed a negative correlation with steering and throttle control performance (e.g. Zhao et al., 2012) and other driver characteristics like age, gender, and driving experience (Liu et al., 2021; Useche et al., 2021).

Based on the above, an additional aim was to test whether personality traits, self-reported driving behavior, and demographic variables interact with the relationship between perspective-taking and traffic risk perception and outcome prediction.

Study 1 predictions

- H1. One's readiness to take the perspective of others (as measured by DSRS) positively relates to more risky predictions of outcomes of traffic situations.
- R1. How do control variables such as Dark Triad Traits, Big Five personality traits, Drivers' Behavioral patterns, and demographic variables relate to evaluating outcomes of traffic situations?

Method

Participants

A total of 154 participants with a valid driving license (self-reported) took part in the study sampled via social media (e.g. Facebook), 46.1% being female with the age ranging from 19–76, with the mean age being 44.69 with a standard deviation of 13.62. On average, the participants had a driver's license for 20.67 years with a standard deviation of 12.59.

Measurements and Materials

To measure risk perception, 8 traffic situations were presented to participants in the form of a video. The situations varied in length from 10 -20 seconds. Situations were acquired by placing an advertisement on social media platforms inviting individuals to submit dashboard camera footage of real-life traffic situations. The submitted videos were then screened and evaluated by the research team of the current study. The chosen situations ranged from city to highway contexts, thus representing various traffic conditions regarding speed, maneuvers, and traffic congestion. The final selection consisted of 4 videos with a hazardous situation and 4 control videos without any hazards. In a previous study by our research group, the hazardous videos were rated by participants to be riskier than the control videos, and they also showed differential eye movement patterns (Èvelis et al., manuscript under review), thus adding to the content validity of the videos. The videos were edited so that the participants would not see how the situation resolved in the video. The videos would stop on a frame before the resolution of the situation and the participants would be asked to predict the resolution of the situation by choosing one of two options. One of the options was the written description of the actual resolution that followed later in the video but was not shown to the participants. The other option for hazardous situations was an equally likely safe resolution of the situation, but for the control situations it was an equally likely hazardous resolution of the situation. All the actual behaviors depicted in the videos and the descriptions of alternative behaviors were independently rated by two experts to make sure that the alternatives described for each video were feasible and realistic, given the traffic situation depicted in the video. Participants' predictions were then classified as being correct or incorrect. The prediction was categorized as being correct if the actual continuation of the video was chosen and incorrect if the alternative prediction was made. According to this categorization, the proportion of correct predictions was calculated for each participant. In addition, for each situation, one of the two alternatives was pre-categorized to be riskier. Thus, for each participant, the proportion of risky choices was calculated based on whether they chose the risky option. Finally, after predicting the outcome of the traffic situation, participants were asked two additional questions about the outcome option they chose:

- (1) Accident likelihood – What is the likelihood of an accident if the situation unfolds in the way you predicted? (0–100%)
- (2) Accident likelihood confidence – How confident are you about your prediction of an accident? (0–100%)

To measure perspective-taking the Driver Situational Reflection Scale (DSRS; Austers et al., 2025) was used. The scale has eight questions in total, comprising two subscales – perspective-taking (sample items “When I see a cyclist, I wonder how I would act in his place.”) and caution (sample item “I am cautious because dangerous situations on the road can arise completely unexpectedly.”), each consisting of 4 questions. The questions are rated on a 7-point Likert scale, from “Very uncharacteristic to me” to “Very characteristic to me”.

To measure driving behavior, a modified version in Latvian language of the Driver Behavior Questionnaire (Reason et al., 1990) was used (Reņģe et al., 2012). The modified version consisted of 29 items comprising 3 subscales: (1) violations (sample items “Become angered by driver and given chase”, “Raced to beat other driver”), (2) errors (sample items “Missed give way signs”, “Attempt to overtake a vehicle making a left turn”), and (3) lapses (sample items “Forget where I parked my car”, “Misread signs and get lost”). Measured on a 1- 7 Likert scale, where 1 is never and 7 is very often.

To measure big-five personality traits, Ten Item Personality Inventory (TIPI; Gosling et al., 2003) was used. Measuring Openness, Conscientiousness, Extraversion, Neuroticism, and Agreeableness with two items per factor. Participants have to indicate on a 7 – point Likert scale how much do they agree that a trait description characterizes them. Where 1 is “Completely disagree” and 7 is “Completely agree”. The inventory has been translated to Latvian language by Reņģe and colleagues (2012).

To measure dark triad traits Short Dark Triad Scale (SDTS; Jones & Paulhus, 2014) was used. The scale consists of 27 items, measuring three facets – Psychopathy, Machiavellianism, and Narcissism with 9 items each. Measured on a 5 – point Likert scale ranging from completely disagree to completely agree. The scale has been translated into Latvian by Baldiņa (2017).

Procedure

Participants were recruited via social media posts, and by posting participation links on various group forums. The survey was hosted on QuestionPro platform. First the participants filled out demographic questions, then proceeded with watching 8 videos and answering questions about each video. After watching the videos, participants filled out DSRS, DBQ and TIPI. After finishing everything, participants were debriefed, they were shown the full videos with the endings for each. The research methodology was approved by the Humanitarian and Social Science Ethics Committee of the University of Latvia (approval no. 71-46/76), which applied to both study 1 and study 2. For data handling and statistical analysis, R version 4.3.2 (R Core Team, 2023) and RStudio version 2024.04.1 were used.

Results

Initially, the descriptive statistics and Cronbach alpha scores for the main variables were calculated (see Table 1).

Table 1 Descriptive statistics and Cronbach alpha scores for the main variables (*N* = 154)

Variable	<i>M</i>	<i>SD</i>	<i>alpha</i>
Traffic video evaluations			
Correct predictions	0.48	0.16	
Risky predictions	0.44	0.21	
Accident likelihood	42.66	21.87	
Accident likelihood confidence	70.32	17.43	
Big Five traits			
Openness	4.97	1.17	
Conscientiousness	5.37	1.14	
Extraversion	4.25	1.39	
Agreeableness	5.29	1.09	
Neuroticism	4.59	1.37	
Dark triad traits			
Machiavellianism	4.12	1.04	.74
Narcissism	3.05	0.86	.58
Psychopathy	2.19	0.87	.63
DSRS			
Caution	5.78	1.05	.81
Perspective-taking	4.80	1.53	.84
DBQ			
Violations	2.57	0.93	.81
Lapses	2.31	0.77	.73
Errors	1.79	0.62	.81

As can be seen in Table 1, all the scales except Narcissism reached acceptable reliability scores since Cronbach alpha scores were above .60, Narcissism scale was just below .60 which would be considered poor reliability and thus should be interpreted with caution (Izah et al., 2023).

To test the first hypothesis that “one’s readiness to take the perspective of others (as measured by DSRS) positively relates to more risky predictions of outcomes of traffic situations” a correlation analysis was done (see Table 2).

Correlation analysis did not reveal any significant correlations between DSRS Caution and Perspective-taking subscales with any of the metrics measured regarding traffic situations. Only the DSRS subscales caution and perspective-taking showed a strong positive correlation.

To answer the research question of “How do control variables such as Dark Triad Traits, Big Five personality traits, Drivers’ Behavioral patterns, and demographic variables relate to evaluating outcomes of traffic situations?”, first a stepwise multiple regression (both directions) was performed to assess whether Big Five traits, Dark Triad traits, self-reported

Table 2 Pearson correlations between DSRS and video ratings (*N* = 154)

Variable	Caution	Perspective-taking
Perspective-taking	.67***	
Correct predictions	.00	.01
Risky predictions	-.13	-.12
Accident likelihood	.02	.03
Accident likelihood confidence	.08	.03

Note. ****p* < .001

Table 3 Results of stepwise multiple regression (both directions) for predicting correct answer proportion from Big 5, Dark triad, self-reported driving behavior, and demographic variables (*N* = 154)

Predictor	<i>b</i>	<i>SE B</i>	<i>Beta</i>	<i>t</i>	<i>p</i>
Openness	-0.16	0.09	-0.15	-1.71	.089
Narcissism	0.34	0.12	0.23	2.72	.007
Driving license years	0.00	0.00	0.14	1.83	.069

Note. Model summary statistics for the final step: $R^2 = .07$, $F(3, 150) = 3.83$, $p = .011$.

Table 4 Results of stepwise multiple regression (both directions) for predicting risky answer proportion from Big 5, Dark triad, self-reported driving behavior, and demographic variables (*N* = 154)

Predictor	<i>b</i>	<i>SE B</i>	<i>Beta</i>	<i>t</i>	<i>p</i>
Extraversion	-0.14	0.09	-0.12	-1.51	.134
Psychopathy	0.29	0.16	0.15	1.75	.082
Violations	0.22	0.16	0.12	1.40	.164
Age	-0.02	0.01	-0.14	-1.70	.091
Gender	-0.57	0.26	-0.17	-2.21	.029

Note. Model summary statistics for the final step: $R^2 = .16$, $F(5, 148) = 5.59$, $p < .001$.

Gender coded 0 = Male; 1 = Female

driving behavior, and demographics could predict the proportion of correct predictions. A total of 14 variables were used in the model. The final step can be seen in Table 3.

The final step of the regression analysis kept three variables – Openness, Narcissism, and the number of years one has a driving license. The only significant predictor though was Narcissism, showing that people higher in Narcissism made more correct predictions.

Another stepwise multiple regression (both directions) was performed to assess whether Big Five traits, Dark Triad traits, self-reported driving behavior, and demographics could predict the proportion of risky predictions. Again, a total of 14 variables were used in the model. The final step can be seen in Table 4.

The final step of the regression model retained five variables – Extraversion, Psychopathy, Violations, Age, and Gender. The only significant predictor of the five was Gender, showing that males more often chose the riskier option provided when evaluating the videos.

Study 2 Predictions

- H1a: Completing the DSRS but not the DBQ before the video evaluation will increase the average riskiness rating of the predicted outcome and the proportion of risky predictions.
- H1b: Completing the DSRS or the DBQ before the video evaluation will increase the average riskiness rating of the predicted outcome and the proportion of risky predictions.
- H2: One's readiness to consider others' perspectives (as measured by DSRS) positively relates to higher risky prediction proportion of traffic situation outcomes.
- R1: How do control variables such as Dark Triad Traits, Big Five personality traits, Drivers' Behaviour patterns, and demographic variables relate to the evaluation of traffic situation outcomes?

Method

Participants

Participants were sampled using a research agency. A total of 352 participants took part in study two, 48% being female with the age ranging from 19 – 76, with the mean age being 45.80 with a standard deviation of 14.36. On average, the participants had a driver's license for 22.00 years with a standard deviation of 13.90.

Measurements and Materials

The measurements and materials used were the same as in study 1. The only difference was that an additional metric was added to the video evaluations. Additionally, we were asked to rate how dangerous the situation depicted was after watching each video. The riskiness of the situation was rated on a 7 – point Likert scale where 1 – safe to 7 – very dangerous.

Procedure

The difference from the first study was in that the participants were randomly assigned to three groups. The groups differed in the order they filled out the tasks. Experimental group 1 did the DSRS questionnaire before they rated the videos and then proceeded to fill out the other measures. Experimental group 2 first did the DBQ questionnaire and then proceeded to fill out all the other measures. Finally, a control group initially filled out the demographic questions and then proceeded to fill out the rest of the measures. In any other regard, the procedure was the same as in the first study.

Results

The descriptive statistics for the main variables can be seen in Table 5. Additionally, to what was asked in the first study, in study two the participants rated how risky the situations were, and in general the situations were rated as being slightly above average riskiness.

Table 5 Descriptive statistics for the main study variables (*N* = 352)

Variable	<i>M</i>	<i>SD</i>
Traffic video evaluations		
Correct predictions	0.43	0.16
Risky predictions	0.42	0.19
Accident likelihood	44.03	19.20
Accident likelihood confidence	66.29	16.15
Average riskiness rating	4.10	0.90
DSRS		
Caution	5.89	0.94
Perspective-taking	4.80	1.47
Dark triad		
Machiavellianism	3.82	1.02
Narcissism	3.55	0.89
Psychopathy	2.49	0.85
DBQ		
Violations	2.44	0.88
Errors	1.66	0.45
Lapses	2.08	0.67
Big Five traits		
Openness	4.80	0.92
Conscientiousness	4.94	0.76
Extraversion	4.33	1.02
Agreeableness	5.12	0.78
Neuroticism	3.59	1.03

Table 6 Pearson correlations between DSRS and video ratings (*N* = 352)

Variable	Caution	Perspective-taking
Perspective-taking	.44***	
Correct predictions	.06	.04
Risky predictions	-.04	-.04
Accident likelihood	.10	.01
Accident likelihood confidence	.12*	.01
Average riskiness rating	.07	.08

Note. **p* < .05, ****p* < .001

To test the first hypothesis that “DSRS scales Caution and Perspective-taking will be correlated with traffic situation evaluations” Pearson correlation analysis was done (see Table 6). The only significant correlation was between Caution and Accident likelihood confidence, showing a weak positive correlation.

Table 7 Descriptive statistics and One-Way ANOVA results for experimental and control groups

Variable	Control group		DBQ		DSRS		<i>F</i> (2, 349)	η^2
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>		
Correct predictions	3.39	1.21	3.48	1.38	3.44	1.34	0.44	.00
Risky predictions	3.36	1.63	3.23	1.44	3.41	1.58	0.14	.00
Accident likelihood	44.93	18.67	43.70	21.54	43.55	17.61	0.18	.00
Accident likelihood confidence	66.85	15.33	69.53	15.10	63.10	17.17	4.93	.03
Average riskiness rating	4.03	0.83	4.33	0.97	3.98	0.87	5.16	.03

Table 8 Results of stepwise multiple regression (both directions) for predicting correct answer proportion from Big 5 traits, Dark triad traits, self-reported driving behavior, and demographics (*N* = 352)

Predictor	<i>b</i>	<i>SE B</i>	Beta	<i>t</i>	<i>p</i>
Openness	−0.13	0.08	−0.09	−1.74	.082
Gender	0.23	0.14	0.09	1.66	.098

Note. Model summary statistics for the final step: $R^2 = .07$, $F(3, 150) = 3.83$, $p = .011$.

Further to test the hypothesis that filling out the DSRS questionnaire first as compared to the control group or filling out DBQ first will lead to higher risk perception and higher proportion of risky predictions a One-Way ANOVA was conducted (see Table 7).

From the One-Way ANOVA results it can be seen that none of the groups differed statistically significantly in either of the video evaluation measures. Thus, not providing support for the hypothesis that the initial filling out of DSRS will lead to higher risk perception or higher proportion of risky predictions.

To answer the research question of whether personality measures both Big 5 and Dark triad traits, self-reported driving behavior, and demographic variables relate to correct and risky response proportion when evaluating traffic situations stepwise multiple regression was carried out. First a stepwise multiple regression (both directions) was performed to assess whether Big Five traits, Dark Triad traits, and demographics could predict the amount of correct predictions. A total of 14 variables were used in the model (final step can be seen in Table 8).

The final step of the regression analysis kept two variables – openness and gender. Though none of the variables in the final step reached significance.

Another stepwise multiple regression (both directions) was performed to assess whether Big Five traits, Dark Triad traits, self-reported driving behavior, and demographics could predict the amount of risky predictions. Again, a total of 14 variables were used in the model (final step can be seen in Table 9).

Table 9 Stepwise multiple regression (both directions) for predicting risky answer proportion from Big 5, Dark triad and demographics (*N* = 352)

Predictor	<i>b</i>	<i>SE B</i>	<i>Beta</i>	<i>t</i>	<i>p</i>
Agreeableness	−0.30	0.12	−0.15	−2.48	.014
Psychopathy	−0.42	0.12	−0.23	−3.57	< .001
Narcissism	0.21	0.10	0.12	2.19	.029
Violations	0.32	0.11	0.18	2.83	.005
Errors	−0.56	0.22	−0.16	−2.58	.010
Gender	−0.53	0.17	−0.17	−3.10	.002

Note. Model summary statistics for the final step: $R^2 = .16$, $F(5, 148) = 5.59$, $p < .001$.

Gender coded 0 = Male; 1 = Female

The final step of the regression model retained six variables – agreeableness, psychopathy, narcissism, violations, errors, and gender. All the variables in the final step reached significance. Agreeableness, psychopathy, errors and gender showing a negative relationship, but narcissism and violations showing a positive relationship with proportion of risky answers.

Discussion

Two studies were carried out with the aim to test if perspective-taking is related to traffic risk perception and whether various individual differences like personality traits, dark triad traits, self-reported driving behavior and demographics mediate this relationship. Study 1 followed a cross-sectional design and tested the hypothesis whether perspective-taking and caution (as measured by DSRS) are related to risk perception. Study 2 went a step further by adding experimental manipulation to see whether thinking about perspective-taking questions by filling out the DSRS questionnaire first will lead to differences in risk perception.

Study 1 did not find any support for perspective-taking and caution being linked to risk perception, while study 2 found only one very weak association between perspective-taking and accident likelihood confidence. Therefore, overall, our study did not find support for the hypothesis that perspective-taking as an individual difference is related to risk perception. Within study 2, the order of filling out the questionnaire as well did not show any effect on risk perception. Additional study by our research group carried out with the same traffic video stimuli and using DSRS measurement found weak associations between caution and perceived riskiness (Dimdiņš et al., manuscript under review). Although perspective-taking is assumed to facilitate the ability to correctly understand the affordances another person has in a given situation (Creem-Regehr et al., 2013), Eyal and colleagues (2018) note that experimental testing finds little evidence in the idea that perspective-taking increases the ability to intuit another's mental states. They even argue that perspective-taking might not increase or even show detrimental effects to one's ability to predict another's inner mental states. Their study additionally found an increase

in confidence in the accuracy of the prediction when perspective-taking was induced. Coincidentally, that is the only relationship we found between caution and video evaluations, where higher caution was related to higher confidence in one's prediction.

As for the research question "How do control variables such as Dark Triad Traits, Big Five personality traits, Drivers' Behaviour patterns, and demographic variables affect the evaluation of traffic situation outcomes?", Study 1 found that out of all the individual difference variables higher narcissism predicted more correct prediction proportion whereas study 2 did not find any significant predictors for correct prediction proportion. Study 1 found that gender was the only variable to predict a higher proportion of risky answers. Study 2, on the other hand, showed multiple significant predictors for risky answers – agreeableness, psychopathy, errors, and gender showing a negative relationship, but narcissism and violations showing a positive relationship. Thus, the results were not consistent across the studies and contradicted existing literature. For example, higher psychopathy predicted lower risky choices, but higher narcissism predicted higher correct answers and higher risky choices. Other studies have as well shown links to driving behavior for dark triad traits (e.g. Uijong et al., 2019), the results in those studies, though pointed to positive relationships with antisocial behavior (e.g., running over pedestrians). In the context of the current study, the dark triad trait relationship with some of the video evaluations could be more of an indication of the nature of the methodology rather than an actual relationship between the variables. It could be that individuals higher in psychopathy, characterized as more manipulative and image sensitive (De Brito et al., 2021), might try to represent themselves as more socially appropriate, hence choosing safer options when evaluating the situations.

The results of the current study further showed that violations were positively related, but errors were negatively related to risky choice proportion, making it hard to discern whether choosing more risky choices is beneficial or not to traffic safety. In both studies, males chose more risky answers than females. It might be that riskier mental models (McKenna & Crick, 1997) are more available to males as it has been documented that males tend to engage in more risky driving, but the ability to correctly predict the outcome of the situation was not different between the genders, similar results have been found in other similar studies, for example studies show that hazard perception skills do not differ between genders (e.g. Scrimgeour et al., 2011).

Limitations

The correct answer proportion was below 50% in both studies. Since there were only two choices to choose from, the observed result was lower than what one would expect by chance. This could mean that the traffic situations depicted in the videos were rather rare and not what one would generally expect. This would imply that the measurement might not actually capture risk perception ability. Additionally, since DBQ measures one's driving patterns which should be related to risk perception ability (e.g. Scialfa et al., 2013), the lack of relationship between DBQ subfactors and the correct answer proportion could also indicate the lack of validity of the videos used.

Suggestions for future research

In terms of traffic safety, various factors could play a role, and accounting for everything is unlikely to be possible. Nevertheless, future studies should aim for laboratory experimental designs with the aim to capture the perspective-taking effect. As the complexity of stimuli increases, successful answers on situation evaluation might depend on other factors, not our direct ability to identify the specific behavior. Additional studies that consider adding physiological measurements (e.g. HRV, EDA) or eye tracking measurements together with perspective-taking could indicate patterns or mechanisms on how perspective-taking allows us to analyze certain traffic situations. Then, combining that with personality and driving characteristics can shed light on why we lean toward safe or risky driving.

Conclusions

- Perspective-taking was not consistently related to traffic risk perception, only to confidence in one's choices, and priming perspective-taking experimentally did not show any differences.
- Individual differences, including personality traits and driving behavior, showed inconsistent and sometimes contradictory associations with risk perception across the two studies.
- Gender differences were observed in risky choices, with males choosing more risky responses, though prediction accuracy did not differ.
- The findings suggest that perspective-taking may not be a reliable target for interventions aimed at improving traffic risk perception.
- Future efforts should focus on more direct methods, such as training or simulations, to enhance traffic safety skills.

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