

Personality factors as predictors of persistent risky driving behavior and crash involvement among young adults

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Objectives: The aim of this study was to examine the relationship between personality factors assessed during adolescence and persistent risky driving behavior and traffic crash involvement among young adults.

Design: Data for this investigation were drawn from the Dunedin Multidisciplinary Health and Development Study, a longitudinal study of a cohort born in Dunedin, New Zealand.

Subjects: The study population was 1037 young people born between 1 April 1972 and 31 March 1973.

Main outcome measures: The main outcome measures were persistent risky driving behaviors and crash involvement, collected in a face-to-face road-safety interview at ages 21 and 26.

Results: The only outcomes for which there were sufficient numbers of females were a driver involved in any crash and a driver involved in an injury crash. Univariate logistic regression revealed that there were no significant predictors for either of these outcomes. For the males, at the univariate level, aggression, traditionalism, and alienation were the personality scales most frequently associated with risky driving behavior and crash risk. After adjusting for driving exposure, only high levels of aggression predicted being a driver involved in a crash, and alienation predicted being a driver involved in an injury crash.

Conclusion: These results suggest that road-safety interventions seeking to deter young adult males from persistent risky driving behavior need to be directed at those who do not endorse traditional views, are aggressive, and feel alienated from the rest of society.

Those aged 15–24 years are at the highest risk of motor-vehicle traffic crashes in New Zealand.¹ In the USA, Canada, and the EU, road crashes are the most common cause of death among those aged less than 25 years.² Evidence has suggested that as adolescents “come of age” for learning to drive, they demonstrate risky attitudes towards dangerous driving practices, such as speeding and not wearing a seat belt.³ These riskier attitudes may be the result of a general overconfidence that young people have with regard to their driving ability⁴ and an overestimation of their ability to recover from error, should one occur.⁵ Not all young people, however, engage in risky driving behavior. Therefore, to develop interventions that will effectively target the high-risk group, the personality characteristics of those most likely to engage in these behaviors need to be elucidated and taken into consideration when developing road-safety campaigns.⁶

Several studies have examined the personality factors that relate to involvement in dangerous driving behavior or crash involvement. From a prospective study of high school students in Canada,⁷ Beirness and Simpson reported that students aged 13–19 years who showed less attachment to traditional values and displayed less attitudinal intolerance of deviance, were more likely to be involved in a crash.⁸ In a study conducted in the UK, West reported that novice drivers who experienced a motor-vehicle crash in the 3 years immediately following their driving test had “inattentive” and “impatient” characteristics, compared with drivers who did not crash.⁹ Dahlen and colleagues have shown that sensation seeking, impulsiveness, boredom proneness, and driver anger predicted crash-related conditions (eg, losing concentration, having a minor loss of control, having a “close call”), and aggressive and risky driving behavior in young American adults (median age 19 years).¹⁰ In a series of investigations conducted in Dunedin, New Zealand to identify the characteristics of persistent risky drivers,^{11, 12} Begg and Langley reported that high levels of aggression and low constraint (a super-factor in the Multidimensional

Personality Questionnaire (MPQ)) predicted persistent risky driving behaviors such as driving fast for the thrill of it, driving faster than 120 km/h on the open road, and following closely behind slower drivers.¹² Low levels of constraint have also been shown to be a risk factor for males for persistent driving after using marijuana¹¹ and for traffic crashes.¹³

The MPQ is a measure of personality factors, developed and standardized with non-clinical populations, that has been established as a predictor of a range of health-risk behaviors such as problem alcohol use, cannabis use, dangerous driving, violent crime, and unprotected sex.⁶ The MPQ contains three super-factors (constraint, negative emotionality, and positive emotionality), each of which contains several scales (table 1).⁶ Constraint, the super-factor that has been consistently associated with driving behaviors, is made up of three factors, traditionalism, harm avoidance, and control. Individuals with low levels of constraint are characterized as impulsive, incautious, and endorsing a radical social environment.⁶ While it has been assumed that impulsivity and incautious behavior are the sub-scales “driving” these results, at this stage, it is unknown which aspects of the constraint super-factor predict crash involvement.

The aim of the present study was to investigate each personality trait measured by the MPQ to determine which factors predicted persistent risky driving behavior and involvement in traffic crashes in young adults.

METHOD

The study population was the Dunedin multidisciplinary health and development study (DMHDS), which is a longitudinal study of the health, development, attitudes, and behavior of a cohort of 1037 people born at the only obstetric hospital in Dunedin, New Zealand between 1 April 1972 and 31 March

Abbreviations: DMHDS, Dunedin Multidisciplinary Health and Development Study; MPQ, Multidimensional Personality Questionnaire

1973. Members of this cohort have been assessed at two-yearly intervals from age 3 to 15 years, and again at 18, 21, 26, and 32 years. The DMHDS is characterized by follow-up rates of 90–95% and the wide variety of studies included at each assessment. A full description of the cohort and the DMHDS is provided elsewhere.¹⁴

Although all of the data presented in this investigation are based on self-report, validity is considered to be somewhat higher than would be the case in a one-off survey of a community or school. The cohort members have a long history of reporting sensitive information without breach of confidentiality¹⁵ and are familiar with the process. In addition, there is a high level of agreement between cohort crash reporting and traffic crash reports recorded by the New Zealand police.¹⁶

Outcome measures

These data were obtained from study members who participated in a road-safety interview at the age 21 and 26 assessments. The road-safety interview was a face-to-face interview, conducted by a trained interviewer using a standardized questionnaire.

Risky driving behaviors

Information was sought on how many occasions, in the past month, study members had: (1) driven a car when they thought they perhaps had too much to drink to be able to drive safely, or (2) driven a car within 2 h of using marijuana. If the behavior had occurred once or more, study members were categorized as “risky”. Study members were also asked how often they: (3) drive fast just for the thrill of it or (4) drive faster than 120 km/h on the open road. Response options for these questions were: never, rarely, occasionally, fairly often, often. The responses of “often” or “fairly often” were considered risky. Study members categorized as risky at ages 21 and 26 years were classified as persistent risky drivers for each of these behaviors.

Crash involvement

Study members were asked to report whether they were the driver of a car that was involved in a crash and whether they were a driver in a car that was involved in a crash in which someone was injured. A crash was defined as that which occurred on a public road and involved vehicle damage. An

injury crash was that which resulted in at least one of the car occupants requiring medical attention. Crash involvement since the previous DMHDS road-safety interview was recorded. Therefore, age 21, self-reported crash involvement was for the period between the age 18 and 21 interviews. At age 26, self-reported crash involvement was for the period between the age 21 and 26 interviews. Responses were dichotomized to yes/no.

Explanatory factors

Personality measures: age 18

Personality was assessed at age 18 using a modified version of the MPQ.¹⁷ For this study, each of the 10 individual scales that make up the three super factors of the MPQ was used: constraint—traditionalism, harm avoidance, control; negative emotionality—aggression, alienation, stress reaction; positive emotionality—achievement, social potency, well-being, social closeness.

For the purposes of this investigation, individual scores for each of the MPQ scales were categorized as low, medium, or high. Those who scored at the 25th percentile or below were categorized as “low”, those who scored between the 25th and 75th percentiles were categorized as medium, while those who scored at the 75th percentile or above were categorized as “high”.

Exposure: age 21 and 26

At ages 21 and 26, a measure of traffic exposure was obtained by asking participants how far they would usually drive in a week. Response options for the age 21 and 26 assessments ranged from 1 (0–25 km/week) to 5 (greater than 100 km/week). Response categories for each assessment period were summed to produce an estimate of exposure over the two periods. Distance traveled was then categorized into low (less than 50 km/week), medium (50–200 km/week), or high (greater than 200 km/week).

Statistical analysis

Univariate relationships between each of the explanatory and outcome variables were explored using logistic regression. As crash risk may be a function of distance driven, for crash outcome variables, multivariate analyses were conducted to assess the strength of the association between the predictors and the outcome after adjusting for exposure to driving. The data collected for this study were obtained over three phases (ages) of a longitudinal investigation. Data from all study members present at each phase were used for the univariate analysis, while only members with complete data for all phases were included in the multiple logistic analysis.

RESULTS

Of the study members who participated in the age 18, 21, and 26 assessments, 969 (93% of the cohort) participated in all three assessments and are included in the present study. Of these, 477 (49%) participants were female and 492 (51%) were male.

Table 2 provides a description of the number of study members for each outcome variable. The only outcomes where there were sufficient numbers of females to undertake a reliable analysis of potential predictors were a driver involved in a crash or a driver involved in an injury crash (table 2). Logistic regression revealed that personality factors did not predict either of these outcomes, and so no further analysis were conducted for the females.

As driving exposure is a crash risk, the relationship between personality characteristics and exposure was assessed (table 3). Driving exposure was associated with traditionalism, well-being, and social closeness. For each of these personality variables, there was a higher proportion of those with a low

Table 1 MPQ scale descriptions (from Caspi *et al*⁶)

MPQ scale	Description of a high scorer
Constraint	
Traditionalism	Desires a conservative social environment; endorses high moral standards
Harm avoidance	Avoids excitement and danger; prefers safe activities even if they are tedious
Control	Is reflective, cautious, careful, rational, and planful
Negative emotionality	
Aggression	Hurts others for own advantage; will frighten and cause discomfort for others
Alienation	Feels mistreated, victimized, betrayed, and the target of false rumors
Stress reaction	Is nervous, vulnerable, sensitive, and prone to worry
Positive emotionality	
Achievement	Works hard, and enjoys demanding projects and working long hours
Social Potency	Is forceful and decisive; fond of influencing others; fond of leadership roles
Well-Being	Has a happy, cheerful disposition; feels good about self and sees a bright future
Social closeness	Is sociable; likes people and turns to others for comfort

level of driving exposure that also reported low levels of these personality characteristics.

The results of the logistic regression for the males are presented in tables 4–6. For the substance use outcomes, no personality traits were associated with unsafe drink driving. Lower levels of traditionalism (odds ratio = 0.24 (95% CI 0.10 to 0.57)), harm avoidance (odds ratio = 0.36 (95% CI 0.16 to 0.80)), and control (odds ratio = 0.28 (95% CI 0.12 to 0.62)), as well as higher levels of aggression (odds ratio = 8.80 (95% CI 3.31 to 23.41)) and alienation (odds ratio = 3.14 (95% CI 1.36 to 7.25)), predicted persistent driving after using marijuana (table 4).

For the risky driving behavior outcomes, higher levels of aggression (odds ratio = 10.93 (95% CI 2.48 to 48.11)) and lower levels of control (odds ratio = 0.39 (95% CI 0.15 to 1.01)) predicted persistent driving fast for the thrill of it. Lower levels of traditionalism (odds ratio = 0.40 (95% CI 0.20 to 0.79)) and higher levels of aggression (odds ratio = 1.81 (95% CI 1.46 to 5.38)) and well-being (odds ratio = 2.06 (95% CI 1.05 to 4.02)) all predicted persistent driving faster than 120 km/h on the open road (table 5).

For males, the same procedure was used to examine the association between each of the personality factors and crash involvement. At a univariate level (data not shown), similar personality traits predicted being a driver involved in any crash and being a driver involved in an injury crash. High levels of aggression (any crash, OR = 2.09 (95% CI 1.28, 3.40); injury crash OR = 2.29 (95% CI 1.09, 4.81)) and alienation (any crash OR = 1.74 (95% CI 1.00, 3.08); injury crash OR = 4.30 (95% CI 1.42, 12.99)) predicted both of these outcomes. Low levels of traditionalism predicted involvement in an injury crash (OR = 2.88, (95% CI 1.19, 6.98)). Interaction between the personality predictors was investigated. However, likelihood ratio test comparison of each logistic model with and without the inclusion of interaction effects revealed no improvement. After adjusting for exposure to driving, aggression was the only predictor of involvement in a crash, while alienation and traditionalism both independently predicted involvement in an injury crash (table 6). Analysis of the receiver operating characteristic curves for each of the models revealed a moderate level of classification accuracy (c-statistic for driver involved in any crash = 0.66, c-statistic for driver involved in an injury crash = 0.69).

DISCUSSION

The current study examined the relationships between personality measured in late adolescence and persistent risky driving behaviors between 18 and 26 years for males. Unlike previous studies that have examined relationships between the higher-order MPQ scales and driving behaviors, the current investigation

sought to examine the relationships between the individual personality traits measured by the MPQ and risky driving behaviors and the potential outcomes of risky driving behaviors, that is a driver involved in a crash or a driver involved in an injury crash as a young adult. Aggression (driver involved in any crash), alienation, and traditionalism (driver involved in an injury crash) were associated with crash risk.

Aggression and alienation belong to the negative emotionality super-factor, while traditionalism, harm avoidance and control belong to the constraint super-factor.⁶ Although low levels of constraint have previously been identified as a predictor of substance use and driving¹¹ and risky driving behavior¹³ in males, the present investigation suggests that the specific factors within this super-factor that predict risky driving behaviors are dependent on the outcome being measured. For example, all three factors were associated with persistent driving within 2 h of using marijuana, while only low levels of control were associated with persistent driving fast for the thrill of it, and low levels of traditionalism and harm avoidance were associated with persistent driving over 120 km/h on the open road. Contrary to expectations, after controlling for exposure to driving, only traditionalism was associated with crash involvement.

It is of interest that previous investigations of the relationships between the MPQ super-factors and risky driving behaviors have not established a relationship between negative emotionality and any of the outcome variables used in this study. These investigations have, however, included another measure of aggression (measured as part of a self report delinquency scale¹⁸), which has been shown to be a predictor of non-alcohol or drug-related risky driving behaviors in males.¹³ The inclusion of this alternative measure of aggression may have masked the effect of the negative emotionality super-factor. In the current investigation, the MPQ factor of aggression was one of the most consistent predictors of these outcomes, being identified as a predictor of all outcome variables except persistent driving after drinking too much and being the driver involved in an injury crash. The other negative emotionality factor was alienation, which was associated with persistent driving within 2 h of using marijuana and being involved in an injury crash.

A significant body of research points to a link between aggression and dangerous driving practices. For example, using the DMHDS data, Caspi *et al* identified that those who recorded a higher aggression score at age 18 were more likely to drive after drinking, travel as a passenger with a drinking driver, and not use their seatbelt.⁶ Unfortunately, the authors only controlled for gender in their multivariate model, and did not investigate gender differences at the univariate stage. The results of this study extended those of Caspi *et al* to show that

Table 2 Frequency of outcome variables in females and males

	Females		Males	
	Yes n (%)	No n (%)	Yes n (%)	No n (%)
Persistent driving after having too much to drink	6 (1)	453 (99)	17 (4)	457 (96)
Persistent driving within 2 h of smoking marijuana	13 (3)	446 (97)	68 (14)	404 (86)
Persistent driving fast for the thrill of it	3 (1)	455 (99)	35 (7)	441 (93)
Persistent driving over 120 km/h on the open road	11 (2)	448 (98)	80 (17)	396 (83)
Driver involved in any crash	133 (29)	344 (71)	214 (43)	278 (57)
Driver involved in an injury crash	42 (9)	435 (91)	60 (12)	432 (88)
	n (%)		n (%)	
Driving exposure				
Low	202(44)		120 (25)	
Medium	197(43)		198 (42)	
High	61(13)		158 (33)	

Table 3 Chi-squared analysis of relationship between personality factors (age 18) and exposure (age 21–26), males only

	Exposure			Total	χ^2 (4df)	p
	Low n (%)	Medium n (%)	High n (%)			
Traditionalism						
Low	38 (38)	27 (27)	35 (35)	100	18.11	0.001
Medium	47 (21)	112 (49)	69 (30)	228		
High	32 (26)	47 (38)	46 (37)	125		
Harm Avoidance						
Low	40 (30)	53 (40)	40 (30)	133	7.90	0.09
Medium	56 (27)	76 (37)	75 (36)	207		
High	21 (19)	57 (50)	35 (31)	113		
Control						
Low	27 (28)	40 (42)	29 (30)	96	7.02	0.13
Medium	54 (23)	90 (38)	90 (38)	234		
High	36 (29)	56 (46)	31 (25)	123		
Aggression						
Low	33 (24)	58 (42)	47 (34)	138	4.87	0.30
Medium	56 (30)	76 (41)	53 (29)	185		
High	28 (21)	52 (40)	50 (38)	130		
Alienation						
Low	19 (23)	41 (50)	22 (27)	82	6.96	0.14
Medium	65 (26)	95 (38)	90 (36)	250		
High	33 (27)	50 (41)	38 (31)	121		
Stress Reaction						
Low	23 (24)	43 (45)	30 (31)	96	4.38	0.36
Medium	61 (24)	103 (40)	92 (36)	256		
High	33 (33)	40 (40)	28 (28)	101		
Well-Being						
Low	39 (31)	50 (40)	35 (28)	124	7.8	<0.001
Medium	51 (25)	91 (44)	63 (31)	205		
High	27 (22)	45 (36)	52 (42)	124		
Social Potency						
Low	44 (25)	70 (44)	49 (30)	163	2.16	0.71
Medium	47 (26)	73 (41)	58 (33)	178		
High	26 (23)	43 (38)	43 (38)	112		
Achievement						
Low	25 (31)	32 (40)	23 (29)	80	5.53	0.24
Medium	59 (28)	79 (37)	73 (35)	211		
High	33 (20)	75 (46)	54 (33)	162		
Social Closeness						
Low	42 (35)	39 (32)	40 (33)	121	9.58	0.05
Medium	39 (24)	66 (41)	56 (35)	161		
High	36 (21)	81 (47)	54 (32)	171		

aggression is also associated with persistent risky driving behavior as well as being the driver in a crash. The Driver Anger Scale has been associated with crash-related conditions such as loss of concentration, loss of control, and having a “close call”, as well as non-aggressive risky driving behaviors such as speeding and driving without a seatbelt.¹⁰ In an earlier study, Hemenway and Solnick reported that “youth and hostility toward other drivers are two of the most significant and important correlates of bad driving”.¹⁹

There is a smaller body of research reporting a link either between alienation or traditionalism and crash involvement. In an investigation of the attitudinal predictors of “interpersonally aggressive” violations on the road, Parker and colleagues suggested that those who get involved in aggressive driving behavior more often develop less negative affective attitudes and possibly “quite enjoy the buzz they get”. Alternatively, they may look forward to the “buzz” and get themselves involved in situations where an aggressive driving incident is more likely.²⁰ Parker also presented another suggestion, that there are certain people who choose to present themselves as drivers who commit driving violations. Such people, considered to have mild levels of social deviance have been reported to have an aggressive driving style, which has been linked to more active

Table 4 Results from the univariate logistic regression to identify personality predictors (age 18) of persistent driving after substance use for males*

	Persistent driving after drinking too much Odds ratio (95% CI)		Persistent driving after using marijuana Odds ratio (95% CI)	
	(Lower to upper)	p	(Lower to upper)	p
Traditionalism				
Medium	2.74 (0.60 to 12.45)	0.2	0.66 (0.36 to 1.19)	0.2
High	1.21 (0.20 to 7.41)	0.8	0.24 (0.10 to 0.57)	0.001
Harm Avoidance				
Medium	1.03 (0.33 to 3.23)	0.9	0.72 (0.41 to 1.29)	0.3
High	0.95 (0.25 to 3.62)	0.9	0.36 (0.16 to 0.80)	0.01
Control				
Medium	0.91 (0.31 to 2.68)	0.9	0.52 (0.29 to 0.95)	0.03
High	0.15 (0.02 to 1.30)	0.08	0.28 (0.12 to 0.62)	0.002
Aggression				
Medium	3.09 (0.65 to 14.79)	0.2	4.93 (1.86 to 13.12)	0.001
High	3.90 (0.80 to 19.14)	0.09	8.80 (3.31 to 23.41)	<0.001
Alienation				
Medium	1.16 (0.24 to 5.71)	0.9	1.11 (0.49 to 2.57)	0.8
High	2.83 (0.59 to 13.69)	0.1	3.14 (1.36 to 7.25)	0.007
Stress Reaction				
Medium	1.70 (0.36 to 8.02)	0.5	1.61 (0.77 to 3.35)	0.2
High	2.93 (0.58 to 14.92)	0.2	1.48 (0.63 to 3.48)	0.4
Well-Being				
Medium	0.72 (0.22 to 2.41)	0.6	0.84 (0.43 to 1.64)	0.6
High	1.22 (0.36 to 4.11)	0.7	1.62 (0.82 to 3.18)	0.2
Social Potency				
Medium	5.33 (1.16 to 24.44)	0.03	1.27 (0.70 to 2.32)	0.4
High	3.01 (0.54 to 16.72)	0.2	1.00 (0.49 to 2.03)	1.0
Achievement				
Medium	3.95 (0.50 to 31.37)	0.2	0.95 (0.46 to 1.96)	0.9
High	3.06 (0.36 to 25.84)	0.3	1.00 (0.47 to 2.12)	1.0
Social Closeness				
Medium	0.64 (0.21 to 1.95)	0.4	1.42 (0.75 to 2.71)	0.3
High	0.39 (0.11 to 1.36)	0.1	1.02 (0.51 to 2.01)	1.0

* For all potential predictors, the “low” group is the reference group.

accidents (where the driver is to blame).²¹ It is possible that those who scored high according to the alienation factor and/or low on the traditionalism factor may have misrepresented themselves as persistently dangerous drivers, resulting in a spurious relationship between alienation/traditionalism and crash involvement. However, the personality measures and risky driving behaviors or outcomes were measured in separate interviews (at age 18 and age 21 and 26, respectively). In addition, research by Underwood and colleagues suggests that those with mild levels of social deviance do have more aggressive driving styles²¹ and, as such, are at higher risk of crash involvement.

The MPQ scales of alienation and aggression have been shown to be correlates of abnormally high levels of delinquent acts in 18-year-olds,¹⁵ and as predictors for multiple risk behaviors including unsafe sex, dangerous driving habits, participation in violent crime, and alcohol abuse in 21-year-olds.⁶ Moffitt *et al*¹⁸ describe those involved in high levels of antisocial behavior throughout the early part of their life (“life-course persistent”) as having high levels of negative emotionality and callousness. It is possible that the outcome variables measured for this investigation represent an extension of the antisocial behavior in which this group engage. If so, it is unlikely that they will divert from this path of dangerous driving behavior and may well go on to become “hard core offenders”¹² in whom it may be extremely difficult to change their behavior.

One limitation of this study was the rough estimate of driving exposure. The driving exposure measure was designed

Table 5 Results from the univariate logistic regression to identify personality predictors (age 18) of persistent risky fast driving for males*

	Persistent driving fast for the thrill of it		Persistent driving over 120 km/h on the open road	
	Odds ratio (95% CI)		Odds ratio (95% CI)	
	(Lower to upper)		(Lower to upper)	
Traditionalism				
Medium	0.97 (0.43 to 2.21)	0.9	0.49 (0.28 to 0.87)	0.01
High	0.33 (0.10 to 1.11)	0.08	0.40 (0.20 to 0.79)	0.008
Harm Avoidance				
Medium	0.84 (0.39 to 1.85)	0.7	0.65 (0.38 to 1.12)	0.1
High	0.47 (0.16 to 1.37)	0.2	0.53 (0.27 to 1.04)	0.06
Control				
Medium	0.38 (0.17 to 0.84)	0.02	1.09 (0.60 to 2.00)	0.8
High	0.39 (0.15 to 1.01)	0.05	0.51 (0.24 to 1.11)	0.09
Aggression				
Medium	5.14 (1.14 to 23.16)	0.03	1.30 (0.67 to 2.52)	0.4
High	10.93 (2.48 to 48.11)	0.002	1.81 (1.46 to 5.38)	0.002
Alienation				
Medium	0.84 (0.29 to 2.44)	0.8	1.28 (0.64 to 2.56)	0.5
High	2.17 (0.76 to 6.25)	0.1	1.23 (0.57 to 2.65)	0.6
Stress Reaction				
Medium	1.13 (0.40 to 3.20)	0.8	0.43 (0.24 to 0.78)	0.05
High	2.69 (0.92 to 7.86)	0.07	0.66 (0.33 to 1.29)	0.2
Well-Being				
Medium	0.58 (0.25 to 1.33)	0.2	1.30 (0.68 to 2.47)	0.4
High	0.73 (0.30 to 1.80)	0.5	2.06 (1.05 to 4.02)	0.03
Social Potency				
Medium	1.27 (0.57 to 2.86)	0.6	1.35 (0.75 to 2.44)	0.2
High	0.92 (0.35 to 2.45)	0.9	1.84 (0.98 to 3.47)	0.06
Achievement				
Medium	0.60 (0.25 to 1.44)	0.3	0.74 (0.38 to 1.47)	0.4
High	0.46 (0.18 to 1.22)	0.1	1.07 (0.54 to 2.11)	0.9
Social Closeness				
Medium	0.60 (0.25 to 1.44)	0.3	1.36 (0.72 to 2.58)	0.3
High	0.46 (0.18 to 1.21)	0.1	1.17 (0.62 to 2.21)	0.6

* For all potential predictors, the "low" group is the reference group.

to be an indicator of those who would be at the highest risk of being involved in a crash simply because they were exposed to more time on the road. It was not designed to be a highly sensitive indicator of the increase in crash risk for each unit increase in time spent driving. As such, we believe that this measure served the purpose for which it was designed.

A second limitation of this study was the inability to explore this issue for females. The small size of the cohort, combined with the small proportion of females who are involved in risky driving behaviors, prevented this analysis.

IMPLICATIONS FOR PREVENTION

This, and previous investigations, have highlighted the importance of certain personality determinants of risky driving behaviors and crash involvement for males. Given that those at risk do not endorse traditional values, are aggressive and feel alienated from society, interventions should be directed towards this group to prevent persistent involvement in these behaviors and their outcomes. Such interventions should branch out from mainstream advertising and tap in to the culture of this group of society, perhaps by focusing on the world-wide web or other alternative forms of media. If personality traits can be identified at a young age, perhaps they could be targeted before these individuals start driving, to try and prevent them developing these behaviors.

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Table 6 Results from the multivariate logistic regression to identify personality predictors (age 18) of traffic crash involvement

	Driver involved in a crash at age 21 or 26 years	p
	Odds ratio (95% CI)	
	(Lower to upper)	
Aggression		
Low	1.00	
Medium	1.59 (0.99 to 2.56)	0.06
High	1.78 (1.04 to 3.02)	0.03
Alienation		
Low	1.00	
Medium	1.09 (0.64 to 1.86)	0.7
High	1.59 (0.86 to 2.94)	0.1
Exposure (age 21–26)		
Low	1.00	
Medium	2.71 (1.62 to 4.54)	<0.001
High	3.97 (2.32 to 6.79)	<0.001
	Driver involved in an injury crash at age 21 or 26 years	
	Odds ratio (95% CI)	
	(Lower to upper)	
Traditionalism		
Low	1.00	
Medium	0.74 (0.37 to 1.48)	0.4
High	0.35 (0.14 to 0.90)	0.03
Aggression		
Low	1.00	
Medium	1.01 (0.46 to 2.23)	1.0
High	1.32 (0.58 to 2.99)	0.5
Alienation		
Low	1.00	
Medium	2.48 (0.83 to 7.39)	0.1
High	3.85 (1.22 to 12.10)	0.02
Exposure (age 21–26)		
Low	1.00	
Medium	1.81 (0.75 to 4.40)	0.2
High	3.22 (1.37 to 7.56)	0.01

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Key points

- There is a higher incidence of persistent risky driving behaviors in young adult males than in young adult females.
- Personality characteristics are associated with persistent risky driving behaviors, and their potential outcomes, in young adult males.
- For males, high levels of aggression are associated with being a driver involved in a crash.
- High levels of alienation and low levels of traditionalism are associated with being a driver involved in an injury crash in young adult males.

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SPECIAL ANNOUNCEMENT**Barry Pless—a celebration of his editorship of *Injury Prevention***

Barry Pless' term of office as Editor of *Injury Prevention* is ending. He has edited the journal since its foundation in 1995, and was involved in its development before the first issue. To celebrate his huge contribution, a festschrift is being presented in Merida, Mexico, to coincide with the 9th World Conference on Injury Prevention and Safety Promotion.

The festschrift, which is being organized with assistance from the ISCAIP (International Society for Child and Adolescent Injury Prevention), will immediately follow the ISCAIP Conference on Friday 14 March 2008 (for details of the ISCAIP Conference, visit <http://www.iscaip.net>).

There is no charge for attendance, but pre-registration is required to allow us to manage numbers. Final details of the program, timings, and venue will be published in due course. If you would like to attend, please contact Mike Hayes (mike.hayes@capt.org.uk).