PERSONALITY AND SPEEDING
– Some Policy Implications –

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While there has been extensive research on the effect of sensation seeking on risky driving, relatively little research has been conducted on Type-A personality. The motivations for speeding are likely to be different for each group and these differences have important implications for the design, implementation and expected efficacy of road safety countermeasures. This paper examines the influence of sensation seeking and Type-A behavior pattern on speeding behaviour. A sample of 139 staff and students in an Australian university were surveyed in July 2001 to gather information on their gender, age, personality and self-reported speeding behaviour. The data were analysed using correlations and analysis of variance procedures. Finally, some implications for road safety are discussed.

Key Words: Road safety, Speeding, Sensation seeking, Type-A behaviour, Road safety policy

1. INTRODUCTION

Road crashes are one of the major causes of death in many developed and developing countries and the leading cause of fatalities of younger people[1-3]. Among the contributing factors to road crashes, speeding is widely recognised as one of the major causes of fatal crashes[4-7]. In Australia, for example, the social cost of road crashes is estimated at AU$15 billion a year[8] and excessive speed is implicated in about a third of the fatal crashes. Similarly, the social cost of road crashes in New Zealand was estimated at NZ$3.6 billion a year and speed was implicated in 39.3% of all road fatalities in 1994 and 32.1% in 1998[9].

The conventional approach to addressing the trauma associated with excessive speed on the road is to impose a sanction on drivers who violate the posted legal speed limit. This approach is based on the presumption that by increasing the expected cost of speeding, drivers could be deterred from engaging in such behaviours. Economic theory posits that a driver's choice of speed depends not only on the expected costs of speeding but also on the expected benefits associated with speeding. In addition to the monetary benefit accruing from the time saved, one of the major intrinsic benefits of speeding, at least for the more sensation-seeking segment of the driving population, is the thrill and adventure associated with the experience.

Sensation seekers generally include persons possessing "a trait defined by the seeking of varied, novel, complex, and intense sensations and experiences, and a willingness to take physical, social, legal, and financial risks for the sake of such experience"[10]. In the area of road safety, the sensation seeking propensity of drivers has been extensively researched and found to be highly correlated to many risky driving behaviours such as drink-driving and speeding[11-16].

Relatively less research, however, has been conducted in the road safety arena, on another source of the demand for speed - people who have a psychological need to speed without actually experiencing the thrill and sensation associated with the experience. These drivers typically have a strong need to get from point A to point B quickly and also to get ahead of others in the traffic flow. Such drivers can be described as having a Type-A behaviour pattern, which is characterised by a strong sense of competitiveness, time urgency, aggressiveness, drive and achievement striving[17,18]. Although much of the research on Type-A behaviour pattern has been conducted in relation to coronary heart disease, several studies have been conducted on the effect of this personality trait on risky driving behaviours. Drivers with Type-A personality were found to have higher rates of traffic violation and crashes, take more risks, drive more erratically, and reported higher incidences of aggressive driving and speeding[18-22].

The purpose of this paper is to explore the relative influence of sensation seeking and Type-A behavior on drivers' self-reported speeding behaviour and their asso-

ciation with age and gender of the driver. More importantly, this paper also attempts to discuss some policy implications for deterring excessive speed on the roads resulting from the two personality traits and their prevalence within different segments of the driving population.

2. METHOD

A survey questionnaire was designed and pilot tested on 20 staff and postgraduate students at the Centre for Accident Research and Road Safety in the Queensland University of Technology. The revised questionnaire was then administered to a convenient sample of 139 participants. The majority of the respondents were university students (67%), with the remaining one third being volunteers recruited by the research team to ensure a more representative spread in age and gender. About 56% of the respondents were female and the age distribution was as follows: under 20 years old (20.1%), 20–24 (15.1%), 25–29 (10.8%), 30–40 (21.6%), 40–50 (10.8%), and above 50 years old (21.6%).

Although the sample contains a very important segment of target population (young male drivers), it consists of a relatively higher portion of the more educated segment of the population. Since the effects of education level on perceptions and intentions towards speeding in Australia have not been well researched and documented, we are unable to judge if any systematic bias exists due to our sampling framework. This study should thus be regarded as an exploratory study that provides some useful insights to understand the roles of two important personality traits on speeding and their policy implications. The results obtained, however, should be confirmed by a broader study using a more comprehensive sample.

Participants completed a self-administered questionnaire that gathered information on their driving behaviour as well as the standard demographic data and measured the two speed-related personality traits using well-established scales. Table 1 summarizes the relevant instruments used and their estimated reliability using Cronbach's Alpha. Four self-report standard 5-point Likert scale items were utilized to measure the extent of speeding behavior on both urban and open roads. The items were scored from 1 to 5 so that larger numbers are associated with more self-reported speeding. As shown in Table 1, the Cronbach Alpha value of 0.79 for the four items on self-reported speeding behavior was fairly high, indicating that this scale was very reliable. It also indicates that the items were highly correlated and multicollinearity may be a problem if the items were used separately. Thus a composite speeding score was created using the sum of the four items.

Sensation seeking was measured by the 10 item forced choice version (Form V) of the widely used "Thrill and Adventure Seeking" sub-scale[23]. This sub-scale was selected because it has been demonstrated to possess the strongest relationship to risky driving[15]. A Cronbach Alpha value of 0.75 was obtained for the items on the sensation seeking scale, indicating that this scale was also very reliable. Again, a composite score representing the number of sensation seeking items selected by the respondent was created, with a higher number representing a greater sensation-seeking propensity.

Type-A behavior pattern was measured by "Bortner's Short Rating Scale of Pattern A Behaviour"[24]. The items were scored from 1 to 11 so that a higher score was associated with a higher likelihood of exhibiting Type-A behavior pattern. Although the original scale had 8 items, only four were used in this analysis because of some concerns regarding its reliability. The reliability of the 8 items Bortner's short scale for Type-A personality was not very high, with an estimated Cronbach Alpha value of only 0.33. Nevertheless, the reliability of this scale was greatly improved, to a Cronbach Alpha value of 0.53, when only the four items shown in Table 1 were used. Again, a composite score for Type-A personality was created using the total of the four item scores.

Pearson's product moment correlation coefficients and probabilities were computed to assess the relationships between self-reported speeding and each of the two personality traits. Also, both the composite sensation seeking and Type-A behavior pattern scores were correlated with age to determine if these personality traits are associated with age. Finally, Analysis of Variance (ANOVA) was performed on the self-reported speeding behaviour and both the personality traits to determine if they differ according to the gender and age (under 25 years old) of the driver.

3. RESULTS

As shown in Table 2, the self reported speeding behaviours were positively correlated with both personality traits. The estimated correlation coefficient for sensation seeking was 0.28 and statistically significant at $\alpha \leq 0.001$, while the estimated correlation coefficient for

Table 1 Summary of mesures

Self-Reported Speeding Behavior
a. I often drive greater than 10 km/h over the speed limit on urban roads.
b. I often drive greater than 20 km/h over the speed limit on urban roads.
c. I often drive greater than 10 km/h over the speed limit on open roads or highways.
d. I often drive greater than 20 km/h over the speed limit on open roads or highways.

Note: Coded from 1 = strongly disagree to 5 = strongly agree. Cronbach Alpha = 0.78. Mean item scores ranged from 1.78 to 2.96. Composite Score is the sum of the four items; mean = 9.51 and standard deviation = 3.61.

Sensation Seeking
For each of the following pairs of statements, please tick the one that most describes your likes or the way you feel.
a. I often wish I could be a mountain climber. I can't understand why people would want to risk their necks climbing mountains.
b. A sensible person avoids activities that are dangerous. I sometimes like to do things that are a little frightening.
c. I would like to take up the sport of water-skiing. I would not like to take up water-skiing.
d. I would like to try surfboard riding. I would not like to try surfboard riding.
e. I would not like to learn to fly an airplane. I would like to learn to fly an airplane.
f. I prefer the surface of the water to the depths. I would like to go scuba diving.
g. I would like to try parachute jumping. I would never want to try jumping out of a plane with or without a parachute.
h. I would like to dive off the high board. I don't like the feeling I get standing on the high board or I don't go near it at all.
i. Sailing long distances in small crafts is foolish. I would like to sail a long distance in a small but seaworthy sailing craft.
j. Skiing fast down a high mountain slope is a good way to end up on crutches. I think I would enjoy the sensations of skiing very fast down a high mountain slope.

Source: Zuckerman (1978)[23]. Coded as 0 for non-sensation seeking and 1 for sensation seeking. Mean item scores ranged from 1.34 to 1.72. Cronbach Alpha = 0.75. Composite score is the sum of the item scores and its mean and standard deviation are 15.82 and 2.68 respectively.

Type-A Behaviour		
Please indicate with an X on the line where you belong between these two descriptions of some common behaviours.		
a. Not competitive	< - >	Very competitive
b. Can wait patiently	< - >	Impatient when waiting
c. Take things one at a time	< - >	Try to do many things at once
d. Fast (eating, walking, etc)	< - >	Slow doing things

Source: Bortner (1969)[24]. Lines Divided into equal segments, and coded such that 1.0 = least Type-A and 11.0 = most Type-A. Item d was reverse scored. Mean item scores ranged from 5.58 to 6.93. Cronbach Alpha = 0.51. Composite score is the sum of the four items and its mean and standard deviation are 25.65 and 7.17 respectively.

Type-A behaviour pattern was 0.24 and statistically significant at $\alpha \leq 0.001$. Although sensation seeking was more highly correlated with self-reported speeding behaviours than Type-A personality, the difference in the correlation coefficient was not very large. These estimates are consistent with those obtained in other studies on the relationship between sensation seeking and speeding[15,25-28], as well as studies on the relationship between speeding and Type-A personality[18,21].

In contrast to previous findings, this study found that self-reported speeding behaviour was not correlated with age. The estimated correlation coefficient (0.019) was very small and not statistically significant (p-value = 0.822). This result was further confirmed by the results

Table 2 Estimation results

Correlations	Speeding Behaviour	Sensation Seeking	Type-A	Age
Speeding Behaviour	—	0.275 (0.001)	0.235 (0.006)	0.019 (0.822)
Sensation Seeking		—	0.092 (0.283)	−0.257 (0.003)
Type-A			—	0.038 (0.660)

Note: Age coded from 1 = under 20 years old to 7 = 65 years old & above. Correlation coefficients and p-values reported in the first and second rows respectively.

ANOVA	Young	Mature	F-Statistics	P-values
Speeding Behaviour	9.32 (3.62)	9.61 (3.62)	0.191	0.663
Sensation Seeking	16.59 (2.21)	15.39 (2.83)	6.568	0.011
Type-A	25.73 (7.82)	25.60 (7.17)	0.010	0.919

Note: Means and standard deviations reported in the first and second rows respectively. Young drivers are under 25 years of age and mature drivers are 25 years old and above.

ANOVA	Male	Female	F-Statistics	P-values
Speeding Behaviour	10.16 (3.91)	9.02 (3.31)	3.315	0.071
Sensation Seeking	16.17 (2.59)	15.56 (2.73)	1.750	0.188
Type-A	26.48 (7.49)	25.01 (6.90)	1.407	0.238

Note: Means and standard deviations reported in the first and second rows respectively.

of the Analysis of Variance procedure, which showed that the mean of the composite self-reported speeding behaviour score for young drivers (under 25 years old) was not significantly different from those of the more mature drivers. The higher reported incidences of speed-related crashes involving young drivers may partly be due to their inexperience or greater exposure rather than their higher likelihood to speed.

On the other hand, consistent with previous studies, this study found that whereas the sensation-seeking propensity of the drivers was correlated with their age, the Type-A behavior pattern was not. The estimated correlation coefficient for the former was 0.24 and statistically significant at $\alpha \leq 0.01$; a result that is consistent with previous studies[15]. Similarly, the estimated correlation coefficient for the latter was 0.04 and not statistically significant (p-value = 0.66); a result that is consistent with a previous finding[21]. Again, these results were confirmed by the Analysis of Variance procedure and are consistent with findings of other studies.

With the results discussed above, it was thus not surprising that our study also showed that the sensation-seeking propensity of a typical driver was independent of his/her tendency to exhibit Type-A behavioural pattern. The estimated correlation coefficient between the two personality traits was only 0.092 and was not statistically significant (p-value = 0.283). The relationship between sensation seeking and Type-A behavior pattern has thus far received relatively little attention in the literature, especially with respect to risky driving behavior. Another interesting result was the similarity in the composite sensation seeking scores and the composite Type-A personality scores between male and female drivers. The Analysis of Variance procedure did not detect any significant difference between males and females in these scores (p-value = 0.663). However, it did detect a slight difference in the self-reported speeding behaviour between the two groups, albeit only at $\alpha \leq 0.10$.

4. DISCUSSION

Consistent with previous studies, this study found both sensation seeking and Type-A behavior pattern to be positively correlated with self-reported speeding behaviour. Furthermore, this study found that the linear association was only slightly stronger for sensation seeking than for Type-A behavior pattern. The latter result implies that sensation seeking may be a slightly better predictor of speeding behavior than Type-A personality. However, this induction has to be qualified since the reliability of the Bortner's short scale used was only moderately high. Further research using other scales to measure Type-A behavior pattern should be conducted to improve its reliability with respect to measuring driving behavior. A result with relatively greater policy implications, however, is the finding that whereas the sensation-seeking propensity of a driver is correlated negatively with age, Type-A behavioral pattern is not.

5. POLICY IMPLICATIONS

One interesting implication of the above results for road safety is that whereas sensation seekers will outgrow their desire for speed, drivers with the Type-A personality trait will not. The tendency of many road safety professionals in some countries to focus more on sensation seeking is partly based on the crash statistics in these countries that indicate an over-involvement by younger drivers in speed related crashes. However, since it is likely that Type-A behavior pattern is a more enduring influence than sensation seeking, it may be argued that relatively more emphasis should be placed on addressing the demand for speed arising from the latter group of drivers.

A review of the literature on sensation seeking in relation to risk taking and anxiety concluded that high sensation seekers do not deliberately seek out risky situations more than low sensation seekers; they just do not perceive the risk[10]. Therefore, it may be possible to change their behaviour by altering their perceived risks associated with speeding through education, enforcement, or a combination of both activities. High sensation seekers, however, also like to drive fast[10], and learning theories, such as Operant Conditioning, suggest that the exhilaration and other intrinsic rewards they receive from driving fast reinforces and so strengthens the behaviour[29]. Therefore, it may be difficult to change the driving behaviour of sensation seekers through education alone and increased enforcement and punishment may be necessary to alter their behavior.

On the down side, however, sensation seekers are willing to take physical, social, legal and financial risks for the sake of the thrill and adventure associated with the speeding experience[10]. Therefore, the likely success rates of the current road safety education and enforcement campaigns on changing the behaviours of these drivers may be limited because these campaigns tend to focus on either the crash risks (physical risks) or apprehension and fines (legal and financial risks). These risks themselves may have the counterproductive effect of acting as an attraction instead of as a deterrent to risk takers. Hence, it may be better to rely on either exposure controls or engineering solutions to address the speeding problems of these risk takers.

Another alternative approach that has been occasionally suggested is to encourage younger drivers to seek their thrills and adventures off-road. The presumption here is that these alternative sources of thrills and adventures are substitutes. However, the extremely high positive correlations among the various forms of thrills and adventure, as measured by the "Thrill and Adventure Sub Scale" indicate that these activities may be complementary and may reinforce the incidences of speeding on the roads rather than reduce them. Nevertheless, since the sensation seeking scale measures only respondents' preferences and not choices, it may still be possible to influence the choices of sensation seekers by changing the relative prices of these activities. By increasing enforcement and punishment, the expected cost of speeding on the road will be increased. If the costs of other thrill and adventuresome activities remain constant, then the change in the relative cost may induce some sensation seekers to engage in less speeding on the road and more of the other activities to satisfy their desire for thrill and adventure.

Among the current road safety strategies, the one that has a fairly high likelihood of success in reducing the problems associated with speeding by sensation seekers is graduated licensing and other forms of exposure constraints. These exposure controls can be gradually removed as the drivers mature and their sensation seeking propensity decreases. In addition, road safety publicity and enforcement campaigns should focus more on license loss and its resultant hardship rather than on the financial, social, or physical risks. Graduated licensing also has an advantage over driver screening since it is less discriminatory and less drastic. Screening out high sensa-

tion seekers when issuing learners' permit is not politically acceptable because it is not only highly discriminatory but presumes a person to be guilty until proven innocent but does not provide the person with an opportunity to prove otherwise. Another advantage of graduated licensing is that it also addresses some of the driving problems associated with inexperience.

With respect to drivers with Type-A personality, the likely effects of the different strategies on their choice of speed may be different from those of sensation seekers. The main motivations for drivers with Type-A personality to speed are competition and time urgency/impatience. The competitive spirit of Type-A personalities may be channelled into more positive activities on the road. The promotion of safe driving activities is an area that has often been overlooked in the road safety arena, which tends to focus more on apprehending and punishing drivers who exhibit unsafe driving behaviours than on rewarding drivers who exhibit safe and courteous behaviours on the roads. Also, since Type-A personalities are not necessarily risk seekers, the likely success of the current education and enforcement campaigns in changing their attitudes and behaviours is relatively higher than for sensation seekers. Furthermore, there are several existing counseling, exercise and other treatment programs that are quite successful in improving the recipients' time and stress management skills[30].

6. CONCLUSION

Consistent with previous studies, this research found that the self-reported speeding behaviour of a convenient sample of 139 drivers were significantly correlated with both their sensation seeking propensity and Type-A behavioral pattern. Also, whereas sensation-seeking propensity tends to decrease with age, Type-A behavioral pattern does not. More importantly, this paper attempts to provide a more elaborate discussion on the policy implications for road safety. It appears that current road safety initiatives, such as education and enforcement activities, are more likely to be effective in changing the behaviour of drivers with Type-A behavioural patterns than drivers who are sensation seekers. The problems associated with sensation seeking on the road can best be addressed by implementing some forms of age-related exposure constraints, such as the graduated licensing scheme.

It should be noted that although efforts have been invested in obtaining a more representative sample with respect to age and gender, the sample is still a convenient sample and the results should be confirmed by further research using a broader sample. However, despite the sample being drawn primarily from the university sector, which presumably comprises the more educated and socially responsible population, respondents reported relatively high sensation seeking propensity, fairly high Type-A behavioral pattern and frequently engaged in speeding. More importantly, the results obtained are consistent with those obtained in other studies. Therefore, the results obtained in this study are likely to be replicated at a higher confidence level when the survey is administered to the general population.

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