PERSONALITY, RISK AVERSION AND SPEEDING: AN EMPIRICAL INVESTIGATION

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ABSTRACT

Evidence suggests that in addition to demographics, there are strong relationships between facets of drivers' personality (e.g., aggression, thrill-seeking, altruism), aversion to risk and self-reported measures of driving behaviour, particularly speeding. However, evidence is muted by the reliance on people to self-report driving behaviour and how this compares to what is observed in the field. This paper reports on a study of 133 drivers in Sydney, who are asked to complete a short survey to develop their personality and risk aversion profiles and self-reported speeding behaviour. A Global Positing System (GPS) device is then installed in their vehicle for a 10 week period as part of a major investigation of driving behaviour from which empirical measures of speeding are derived based. Among the most pertinent findings are: 1) the tendency for drivers to both under and over-estimate their propensity to speed, 2) significant heterogeneity in speeding with a small, but notable number of drivers exceeding the limit for more than 20 percent of the distance driven, 3) weak relationships between the personality/risk-aversion measures and actual speeding, and 4) the suggestion that different personality traits appear to influence behaviour in different situations both from self-reported and actual speeding behaviour.

Keywords: Personality, speeding, GPS

INTRODUCTION

Despite strategies to the contrary, exceeding the posted speed limit remains an all too common occurrence on Australia's roads. For instance, one recent study conducted in South Australia, found that almost one-third of licensed drivers were caught speeding in 2007 (Wundersitz et al., 2009). Similar percentages are reported for New South Wales, where speeding was reportedly a factor in one-third of fatal crashes in 2007 (New South Wales Centre for Road Safety, 2008). Focusing on the 'human' element behind speeding, researchers have uncovered a number of personality traits that appear to be correlated with a greater likelihood of speeding including sensation seeking (Tay et al., 2003),

efficacy/confidence and less aversion to risk (Machin and Sankey, 2008). This in turn has had ramifications for behavioural strategies designed to reduce the desire to speed.

While these studies have undoubtedly uncovered crucial information in the battle against excessive speed, almost without fail they rely on self-assessments from participants on their own speeding behaviour. Limited evidence suggests that people under- or over-estimate their speed depending on the particular context (Hatfield et al., 2008). However, comparisons are thwarted because of a lack of empirical evidence of on-road driving. Most evidence on speeding comes via enforcement records, but this is basically a snap-shot at a point in time. It does not capture the prevalence, magnitude and variability in speeding for drivers on a day-to-day basis.

With this in mind, this paper reports on a study of 133 drivers in Sydney, who were asked to complete a short survey to develop their personality and risk aversion profiles and self-reported speeding behaviour. A Global Positing System (GPS) device was then installed in their vehicle for a 10 week period as part of a major investigation of driving behaviour from which empirical measures of speeding are derived (Greaves et al., 2010). Combining both the empirical evidence from the GPS with the self-assessments of personality and speeding provides some intriguing insights into both the prevalence of speeding and the extent to which perceptions match reality.

LITERATURE REVIEW

Speeding Measurement

Essentially, there are three methods for assessing the prevalence and magnitude of speeding, namely enforcement records, self-reports of speeding and observed driving behaviour. Each of these has advantages and disadvantages. It should be noted that crash information is not included in this assessment because while it indicates whether speeding was a factor in an accident, it does not indicate the prevalence of speeding in all situations.

Speeding Enforcement Records

Speeding enforcement records are based on police reports and/or automated devices (cameras). Manual enforcement by police suffers from police leniency in enforcing speed limits. In many cases police reduce the speed for which drivers are fined or provide only a verbal warning. This leniency understates the extent and magnitude of speeding (Schafer and Mastrofski, 2005). Furthermore, manual and automated speed enforcement is limited by operational resources which restrict the amount of time and the number of locations for which enforcement can take place (Wilson et al., 2006). Automated speed enforcement records also suffer from the inability to identify the driver – thereby hampering the collection of additional driver measures such as gender and age (Delaney et al., 2005). The advantages of using speed enforcement records – especially when including records from automated enforcement – includes the relatively large number of records and the inclusion of speeding data when no crash had occurred. In Victoria, during 2003, automated enforcement devices alone issued an average of 96,000 citations each month (Delaney et al., 2005).

Self-Reported Speeding Behaviour

As with speed limit enforcement records, self-reported speeding suffers from under-reporting of speeding behaviour (Hatfield et al., 2008). The extent to which drivers understate their driving speed is greater the faster they drive. In contrast, at lower speeds many drivers over-state their driving speed (Corbett, 2001). Nonetheless, self-reported speeding data is useful because:

- It may include incidences of speeding that did not result in a reported crash or were not caught through enforcement measures;
- There is an opportunity to collect demographic or personality variables from respondents; and
- Depending on the selected sample, may be more representative of the general population than enforcement and crash records.

In addition to the impact of under-reporting and at times over-reporting of speeding behaviour, self-reporting studies are limited by the complexity of the survey questionnaires or interviews and how much data it is feasible to collect (Goldenbeld and Schagen, 2007).

Observed Speeding Behaviour

While crash information, enforcement records and self-reported driving behaviour provide an indication as to the prevalence of speeding across drivers they are limited by:

- The number of measuring locations;
- The inability to monitor the same drivers in multiple situations across time;
- The lack of detailed data on the frequency of speeding by driver;
- The perceived under-reporting of speeding when using self-reporting surveys; and
- The limited possibility of collecting demographic and psychological data about drivers recorded using speed cameras.

Until recently, it has essentially been impossible to derive such information because it necessitates monitoring of speeds while people are driving around as per normal. However, developments in GPS technology have opened up new possibilities with the potential to discretely monitor speeds over an extended period of time. The most comprehensive example of this was undertaken in Atlanta, where 172 vehicles were equipped with GPS devices and speeds (among other parameters) monitored for several months (Ogle, 2005). The main findings of this study were that on average, (an astonishing) 40 percent of all driving activity was above the posted speed limit and there was considerable intra as well as inter-driver variability in speeding. Clearly, while these types of approaches offer more complete information on individual drivers' behaviour, they are resource intensive (limiting sample sizes) and there is the danger of contamination – that is the driver changes behaviour because they are being monitored.

Personality Characteristics and Speeding

A wealth of knowledge has been built up in the understanding of speeding and how this is linked to personality characteristics (Ulleberg and Rundmo, 2003). In a recent self-reported survey of speeds, Fleiter and Watson (2005) found that over one-third of drivers would prefer to exceed the speed limit in 60 km/h zones with over half preferring to exceed the speed limit in 100 km/h zones. They also found that younger drivers preferred higher speeds in both zones and that males preferred higher speeds in the 100 km/h zone. In terms of personality traits, several researchers have shown that the sensation seeking propensity of drivers is highly correlated with risky behaviours such as speeding (e.g. Jonah et al., 2001). Others have focused on the 'classic' personality types, demonstrating Type-A personalities are more likely to speed (Tay et al., 2003). Conversely, characteristics such as altruism and aversion to risk have been shown to be negatively correlated with speeding (Machin and Sankey, 2008).

METHODS

Recruitment

The original aim was to recruit 148 motorists (based on the number of available devices) with equal proportions of young (17-30 year-old drivers) and middle-aged (31-65 year-old drivers). Drivers were recruited using an online panel with face-to-face delivery and installation of GPS devices. Note, the true purpose of the study was masked from participants because of the potential for affecting their driving in the before period. All participants were told was that the aim of the study was to follow a number of drivers and track their vehicle usage to help transport planning in Sydney. An incentive of AU$30 was payable for participation (note, this was unrelated to the money they could make by changing driving behaviour).

Driving Personality Survey

The driving personality survey was designed to capture facets of personality, risk perception, and driving behaviour shown by previous research to be correlated with self-reported speeding behaviour[1]. Demographics and other personal information had been captured through the original recruitment process, so the survey itself comprised five sections (50 questions total), which took around ten minutes to complete and were as follows.

- Personality scales covering variables shown by previous research to be correlated with self-reported speeding behaviour: namely Aggression, Excitement-Seeking, and Altruism measured on a ten point scale ranging from 'Not at All' to 'Very Much' (Ulleberg and Rundmo, 2003).

[1] The authors wish to acknowledge and thank Prof. Anthony Machin for sharing his survey developed for young drivers in Queensland with us for adaptation for this study.

- Risk perception scales comprising a Worry and Concern five-point scale (Rundmo and Iversen, 2004) and three cognition-based scales, namely a Likelihood of Accident (both for self and other drivers) ten point scale, an Efficacy five-point scale and an Aversion to Risk five-point scale (Machin and Sankey, 2008).
- Driving Behaviour scale covering six questions designed to determine the (self-reported) extent to which participants exceeded the speed limit by 10 km/h and 20 km/h in 50 km/h, 60-80 km/h and 100-110 km/h zones on a five point scale ('Never', 'Rarely', 'Occasionally', 'Often', 'Very Often'). A further four questions were included to capture general indicators of 'undesirable' driving behaviour, including overtaking the car in front when it is driving at the speed limit, driving too close to the car in front, and bending or ignoring road rules to get ahead.

The GPS Survey

The GPS component of the survey involved each participant taking an in-vehicle GPS device for a ten-week period (see Greaves et al. 2010 for details). The first five weeks of the survey involved monitoring driving habits as per usual, while the second five weeks involved monitoring driving habits following the imposition of a variable-rate charging scheme. **Only the information from the first five week period was used for the analysis here and it is important to stress that drivers were not informed at that stage the study was about speeding to avoid the contamination issue**. The information from the device was manipulated to provide the following information for each trip: start and end times, travel time, distance, and speeding behaviour. Note that speeding was identified through map-matching to a GIS-based representation of the Sydney street network, which includes accurate speed limits. The speed limit database has been developed from the ground up by driving all the streets in Sydney and includes temporal variations in speed limits such as school zones[2]. These data were then uploaded on a daily basis to provide the basis for an Internet-based survey in which participants were able to view their trips from the previous day and provide additional trip information (purpose, who was driving, number of passengers) in a Google-map style interface.

Data Processing

A data processing tool written in Visual Basic for Applications (VBA) was developed to collate and process data from multiple sources including:

- Second-by-second GPS and speed limit information;
- Trip-level information such as the trip purpose, driver and number of passengers;
- Demographic and psychological data collected from study participants;
- Hourly rainfall measurements from 15 observation stations in Sydney provided by the Australian Bureau of Meteorology (BOM); and
- Location and street address of schools in New South Wales to identify school zones.

[2] School zones typically operate from 8:00 a.m. – 9:30 and from 2:00 p.m. – 4 p.m. in Sydney during which time the speed limit is reduced to 40 km/h.

Data which had been marked as invalid in the database were excluded. GPS points, trips and drivers for which there was incomplete information were also excluded. Although all valid data were imported into SPSS, the analysis otherwise excluded valid data when the actual speed was equal to zero. The reason for this is that including points where the vehicle was stopped would clearly understate the extent of speeding. Data for locations for which the speed limit was 10, 20 or 30 km/h and locations for which the speed limit is not available – identified in the database by a speed limit of 999 – were also excluded. The final output of this stage of the processing was two files – one at the second-by-second level and one file segmented by speed limit, which were then imported into SPSS for analysis.

Second-by-Second Dataset

The second-by-second dataset contained driver-level, trip-level and observation-level information for each data point. This included the latitude, longitude, actual speed, speed limit, time and date, trip purpose, number of passengers and the driver name. Table 1 describes each of these variables.

Table 1 – Variables generated for second-by-second dataset

StopNormSpeed	Indicates if the driver is stopped (-1), is driving at or below the speed limit (0) or speeding (1).
Speeddif	Is the difference between the driver's actual speed and the speed limit. This can be a positive or negative number.
Speed75P	Indicates if the vehicle is moving in excess (1) of 75 percent of the speed limit or not (0).
SpeedO1B **SpeedO10B** **SpeedO20B**	Indicates if the vehicle is moving at or above 1 km/h, 10 km/h or 20 km/h above the posted speed limit (1) or not (0)
TimeCat	Is a nominal variable indicating the time of day. The possible values cost of Morning (05-08:59), Day (09-14:59), Afternoon/Evening (15-19:59) and Night (20-04:59).
TimeWkd	Is similar to TimeCat except comprises of only two categories: Day (05-19:59) and Night (20-04:59).
Day	Is a nominal variable indicating the day of the week
Weekend	Indicates if the event took place on Saturday or Sunday (1) or Monday to Friday (0).
PrimaryDriver	Indicates if the stated driver for this trip is the primary driver (for which demographics and psychological data is available) (1) or not (0).
SchoolZone	Indicates if the event occurred within a school zone (1) or not (0). This only applies during the days and times for school zone speed limits apply.
Rain	Indicates if there was any rainfall recorded at the closest observation station during this time (1) or not (0).[3]

[3] The closest observation station was calculated by measuring the distance between the vehicle and all 15 observation stations using a formula derived from the Great Circle Distance.

Segment-level Dataset

The second-by-second data resulted in millions of rows of data and processing time aside, was difficult to use and interpret. It was therefore deemed necessary to aggregate the data in some way for further analysis. After experimenting with aggregation at both the trip and speed limit level, it was resolved that aggregating based on speed limit segments created a manageable data set, which maintained the intrinsic characteristics of the original data. This process of aggregation involved a new segment starting at the beginning of each trip, at the beginning and end of school zones and every time the speed limit changed - Figure 1 depicts how segments were defined.

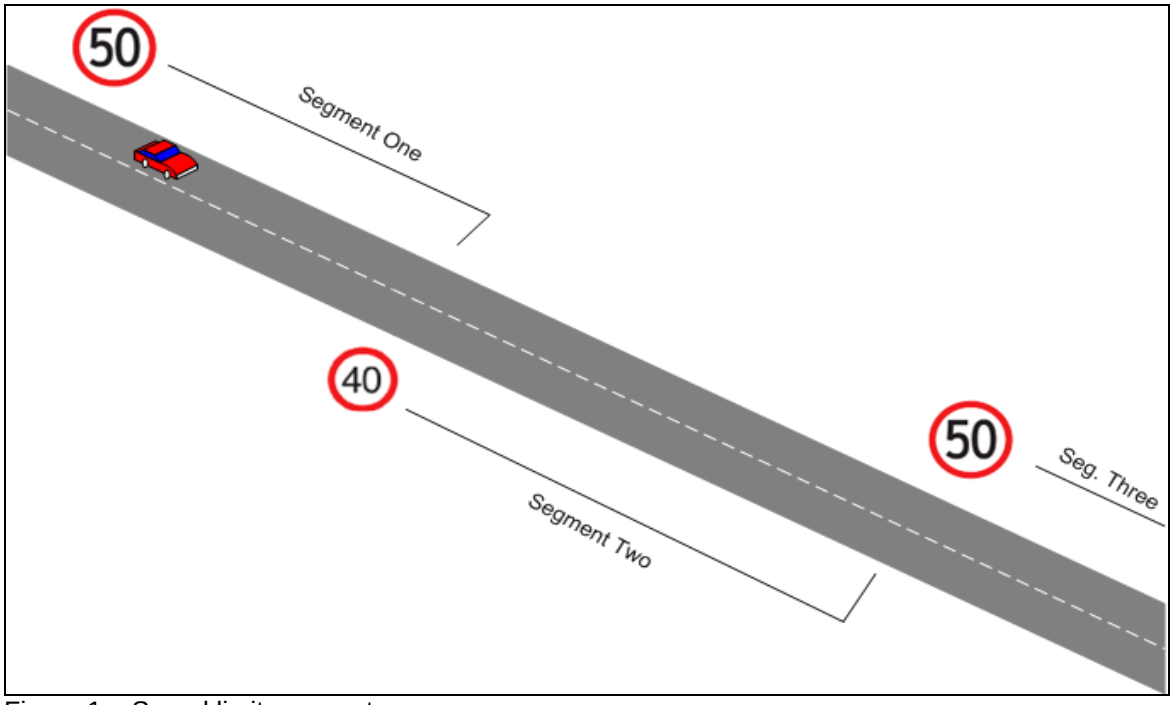

Figure 1 – Speed limit segments

Like the second-by-second dataset, the segment-level dataset contained driver-level, trip-level and observation-level data. However, the aggregation by segment required additional variables to account for speeding within a segment as opposed to only a single point in time. A key issue here in the aggregation was the speeding was based on the *distance* spent speeding (not the time) within a segment. The rationale behind this is that a greater distance is covered every second at higher speeds than at lower speeds (Ogle, 2005). Therefore, measuring speeding by time would overstate the amount of speeding at slower speeds and understate the amount of speeding at higher speeds.

An additional consideration was to try to identify the propensity to speed given the opportunity to speed, which is impacted by the traffic and road conditions under which the driver is operating. Clearly, we do not know these conditions for each driver for every second they drove so a proxy is needed (e.g. time-of-day, road type etc). A simple approach is to take speeds exceeding some percentage of the speed limit as a proxy. While obviously a far from perfect indicator, this has been shown to be a reasonable indicator of opportunity to speed (Lin & Niemeier, 2003). In our case, we took speeds exceeding 75% of the speed limit as this proxy, based on recent evidence from California in which the average speed in

congested conditions was found to be approximately 75% or less of the speed limit, while the average speed in congested conditions was higher than 75% of the speed limit.

A summary of the variables used in the analysis is provided in Table 2.

Table 2 – Additional variables generated for segment-level dataset

NumObs	The number of second-by-second observations included in each segment.
AvgSpeed	Is the average speed recorded within the segment (excluding points where the speed is 0 km/h).
Speed1S	Indicates if the vehicle exceeded the speed limit by 1 km/h or more for at least 20 percent of observations included in the segment.
DistSpeed75P	Is the distance travelled during the segment at a speed exceeding 75 percent of the speed limit.
DistSpeed01 **DistSpeed10** **DistSpeed20**	Is the distance travelled during the segment at or above 1 km/h, 10 km/h or 20 km/h above the speed limit.
TotSegDist	Is the total distance of the segment.
Rain	Indicates if there was rainfall recorded for at least 50 percent of observations included in the segment (1) or not (0).
Speed75Pp	Is the percentage of observations recorded in excess of 75 percent of the speed limit.
SpeedO1p **SpeedO10p** **SpeedO20p**	Is the percentage of observations recorded at or above 1 km/h, 10 km/h or 20 km/h above the posted speed limit.

ANALYSIS

Sample Composition

Following many challenges and delays during the recruitment phase, the composition of the final sample of 148 drivers was as follows: 16 Males 17-30 years-old (11%), 25 Females 17-30 years-old (17%), 52 Males 31-65 years-old (35%) and 55 Females 31-65 years-old (37%). In particular, it proved particularly problematic to recruit young drivers, especially males and clearly this must be borne in mind when interpreting results. Note that due to drop-outs and other data problems, a final sample of 133 drivers was used for the analysis presented here.

Self-Reported Speeding Behaviour

Table 3 provides descriptive statistics, Cronbach's alphas and intercorrelations among the variables for the self-reported speeding behaviour. Cronbach's alphas (α) are a measure of the internal consistency (or reliability) of a scale, with a generally accepted level for interpretation of α >=0.70 (Machin and Sankey, 2008). The mean value for speeding is approaching two, suggesting that overall participants believe they rarely exceed the limit by 10 km/h or more. Speeding was positively correlated with two of the personality variables,

excitement (*r* = 0.402) and aggression (*r* = 0.227) as expected. Efficacy/confidence also emerged as a positive correlate (*r* = 0.274), while aversion to risk was negatively correlated (*r* = -0.384), again in line with expectations. Interestingly, the perceived likelihood of an accident was only marginally correlated (*r* = 0.180) at the 0.05 level of significance suggesting people do not see a strong connection between this and speeding (at least when it relates to themselves).

Table 3 - Descriptive statistics and intercorrelations among speeding, personality and risk perception

N = 133	Mean	S. D.	1	2	3	4	5	6	7	8
1. Speeding/5	1.881	1.207	0.857	.227**	-0.157	.402**	-0.007	.180*	.274**	-.384**
2. Aggression/10	4.693	1.444		0.765	0.063	.359**	-0.014	.198*	-0.086	-0.164
3. Altruism/10	7.089	1.385			0.643	-0.041	0.098	-0.158	-0.019	.220*
4. Excitement/10	2.470	1.954				0.858	-0.068	0.158	.184*	-.376**
5. Worry and Concern/5	2.218	1.043					0.893	.171*	-0.012	.212*
6. Likelihood of Accident/10	3.055	1.870						N/A	-.166	.038
7. Efficacy/5	3.788	1.404							0.890	-0.100
8. Aversion to Risk/5	3.749	0.868								0.639

**Significant at 0.01 level (2-tailed); *Significant at 0.05 level (2-tailed); Cronbach alphas on the diagonal

Breaking the speeding information down by speed limit and magnitude (Table 4) suggests that participants self-report comparatively more speeding overall in 50 km/h zones, with a greater extent of higher magnitude speeding in 100-110 km/h zones. Given 50 km/h is the default limit for residential areas in Sydney, this is of particular concern. The other interesting point to note is that the significant personality and risk variables appear to influence behaviour in different situations. For instance, it appears that aggression is the main driver of speeding in 50 km/h zones, efficacy in 60-80 km/h zones and excitement for the other four speeding scenarios. In terms of traits associated with less self-reported speeding, aversion to risk dominates all speeding scenarios and there is now some suggestion that the likelihood of an accident is a factor in higher magnitude speeding.

Table 4 – Correlations between self-reported speeding behaviour, personality and risk perception

N=133	Mean	S.D.	2	3	4	5	6	7	8
>10 km/h in 50 km/h zones	2.466	.909	.234**	-.115	.147	-.030	.050	.118	-.343**
>10 km/h in 60-80 km/h zones	2.338	.834	.167	-.239**	.280**	-.094	.078	.300**	-.354**
>10 km/h in 100-110 km/h zones	2.278	.907	.200*	-.175*	.399**	-.166	.161	.331**	-.270**
>20 km/h in 50 km/h zones	1.338	.576	.157	-.038	.336**	.124	.151	.108	-.247**
>20 km/h in 60-80 km/h zones	1.346	.663	.155	-.081	.339**	.195*	.233**	.178*	-.289**
>20 km/h in 100-110 km/h zones	1.519	.794	.123	-.039	.388**	.038	.195*	.193*	-.259**

**Significant at 0.01 level (2-tailed); *Significant at 0.05 level (2-tailed)

2 = Aggression; 3 = Altruism; 4 = Excitement; 5 = Worry and Concern; 6 = Likelihood of Accident; 7 = Efficacy; 8 = Risk Aversion

GPS Speeding Behaviour

A summary of speeding behaviour by speed limit derived from the GPS data is presented in Figure 2 for the 133 motorists over the five-week sampling period. Overall, 19 percent of the distance driven was spent above the speed limit, four percent of the distance was spent more than 10 km/h above the speed limit and 0.8 percent greater than 20 km/h above the speed limit. Based on the metric of speeds exceeding 75 percent of the posted speed limit, the respective percentages were 28 percent (speeding), 6 percent (>10 km/h) and 1 percent (>20 km/h). Figure 2 suggests that both speeding per se and higher speeding are most prevalent on motorways and more worryingly at the lower speed limits which are implemented in residential areas.

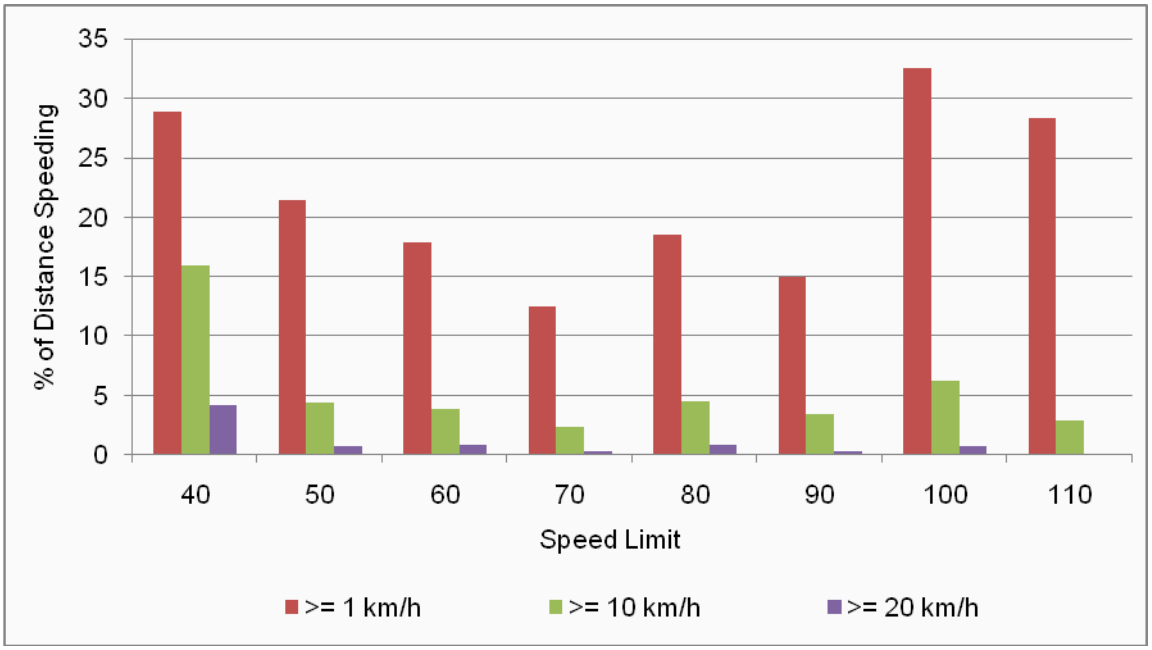

Figure 2 – Speeding by Speed Limit (GPS Data)

In terms of other variables, the distance spent exceeding the speed limit was found to be marginally higher on week-ends (21.5 percent) compared to weekdays (18.3 percent) and higher at night (22.5 percent) than during the day (18.7 percent). Speeding was highest when driving alone, decreasing with one or two passengers before increasing again with three passengers. In terms of trip purpose, speeding was highest on commuting trips to work (21 percent) and lowest on trips related to education/childcare (16 percent). Intuitively this reflects the fact that people drove more carefully with children in the vehicle.

While the use of averages and aggregate figures gives some overall sense of speeding across the sample, it masks the considerable heterogeneity across the sample. Figure 3 provides the speeding behaviour across the 133 drivers with several interesting insights. First, every driver exceeded the speed limit at some point in the five-week period and only one driver did not exceed the speed limit by more than 10 km/h. Second, 57 drivers

exceeded the speed limit for more than 20 percent of the distance they drove with 14 drivers exceeding it for more than 30 percent of the distance - the most prevalent speeding was an almost improbable 61 percent. Third, eight drivers exceeded the limit by more than 10 km/h for more than 10 percent of the kilometres driven, with the most prevalent speeding approaching 20 percent of the distance, again a staggering amount. The pattern that emerges is that while the majority of drivers' exhibit relatively marginal speeding behaviour, there is a small, but notable minority who are regularly exceeding the speed limit by large amounts.

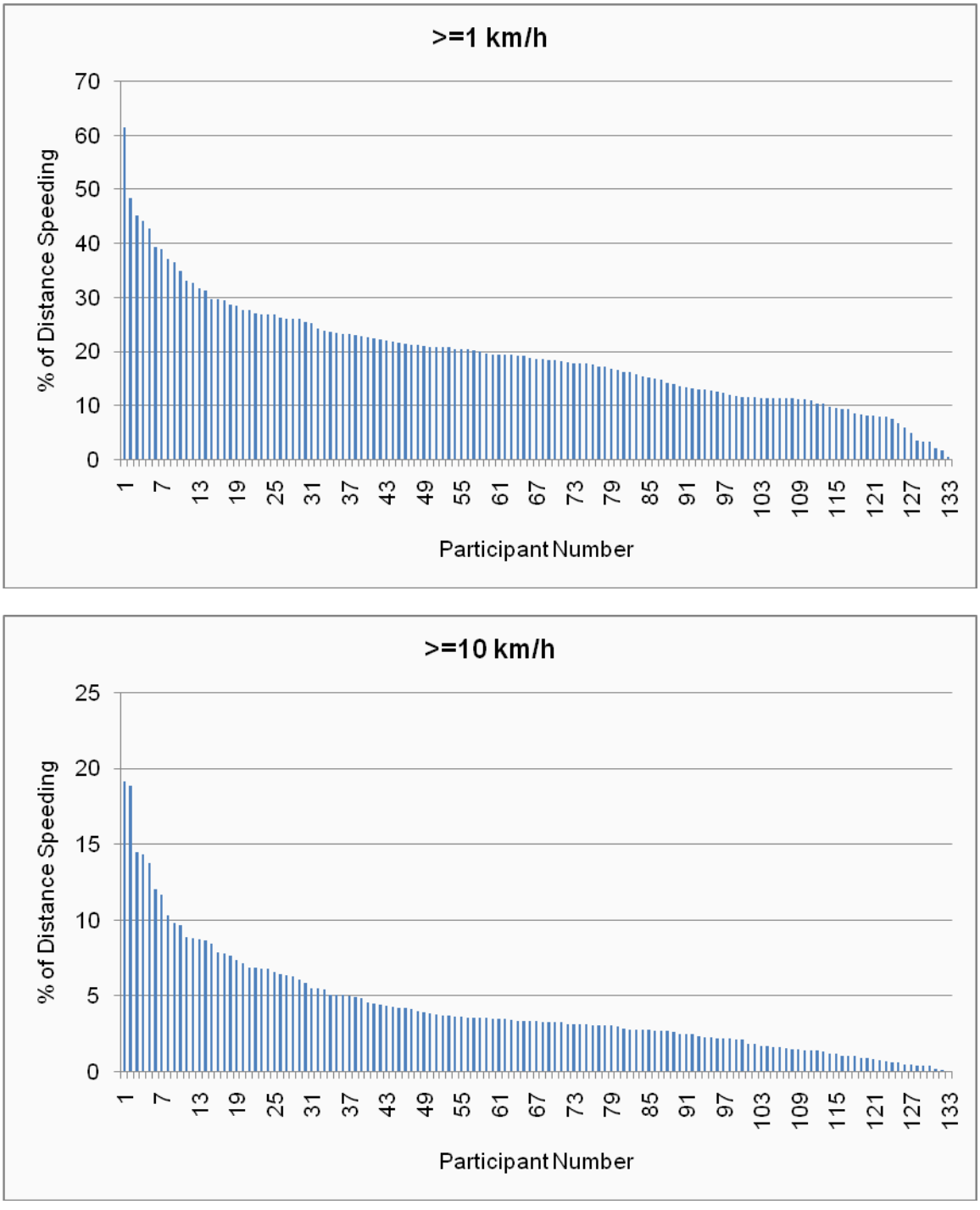

Figure 3 – Speeding by Participant (GPS Data)

Self-Reported versus GPS-Based Speeding Behaviour

Overall, there was a significant positive correlation (*r=0.334, p<0.01*) between the self-reported and GPS-based speeding behaviour. Viewing this information by participant (Figure 4) provides a more comprehensive picture with the suggestion that there are several instances of both under- and over-estimating speeding propensity backing up the findings of other research (Hatfield et al., 2008; Corbett, 2001).

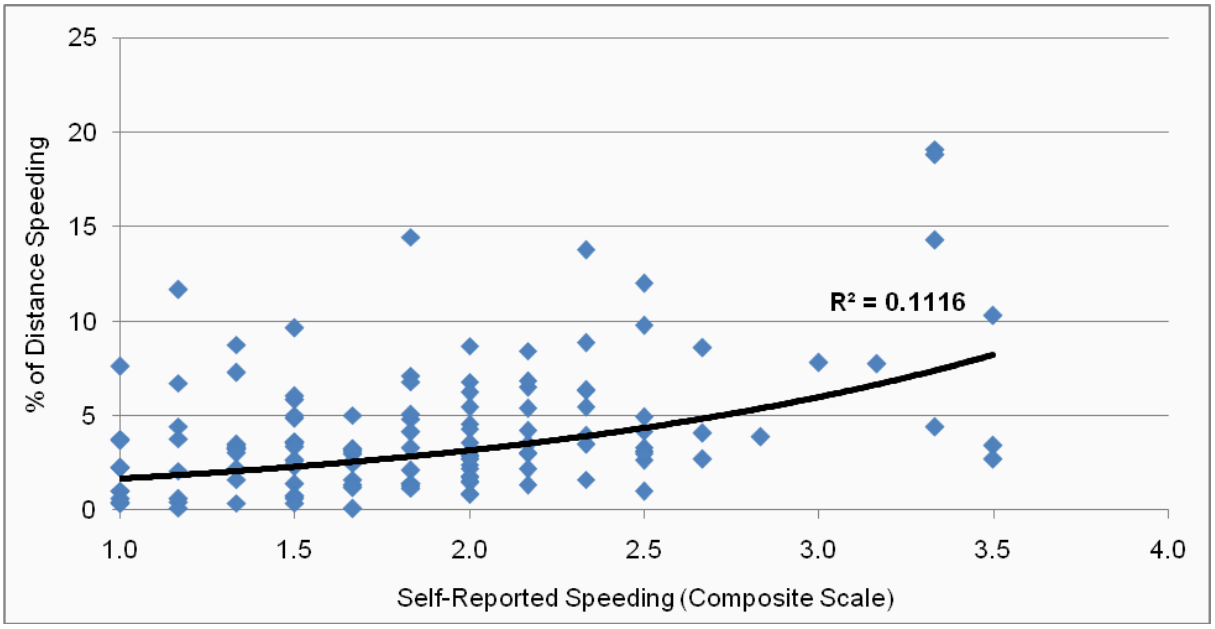

Figure 4 – Self-Reported speeding versus GPS-Based speeding

Correlations were run for the six self-reported speeding behaviours and the corresponding actual speeding behaviours computed from the GPS data. For the 50 km/h zones, correlations were positive and significant (*r =0.243, p<0.01*) as was the case with 60-80 km/h zones (*r =0.349, p<0.01*). However, correlations for the 100-110 km/h zones were (perhaps surprisingly) not significant. Looking further into this issue, Figure 5 shows the self-reported assessment of exceeding the speed limit by more than 10 km/h in the three speed zones versus the GPS information. The trend is marginally upward until the highest category (Very Often), when the increase is dramatic. The other notable feature of the graph is that those reporting they never speed apparently do, all be it at marginal levels.

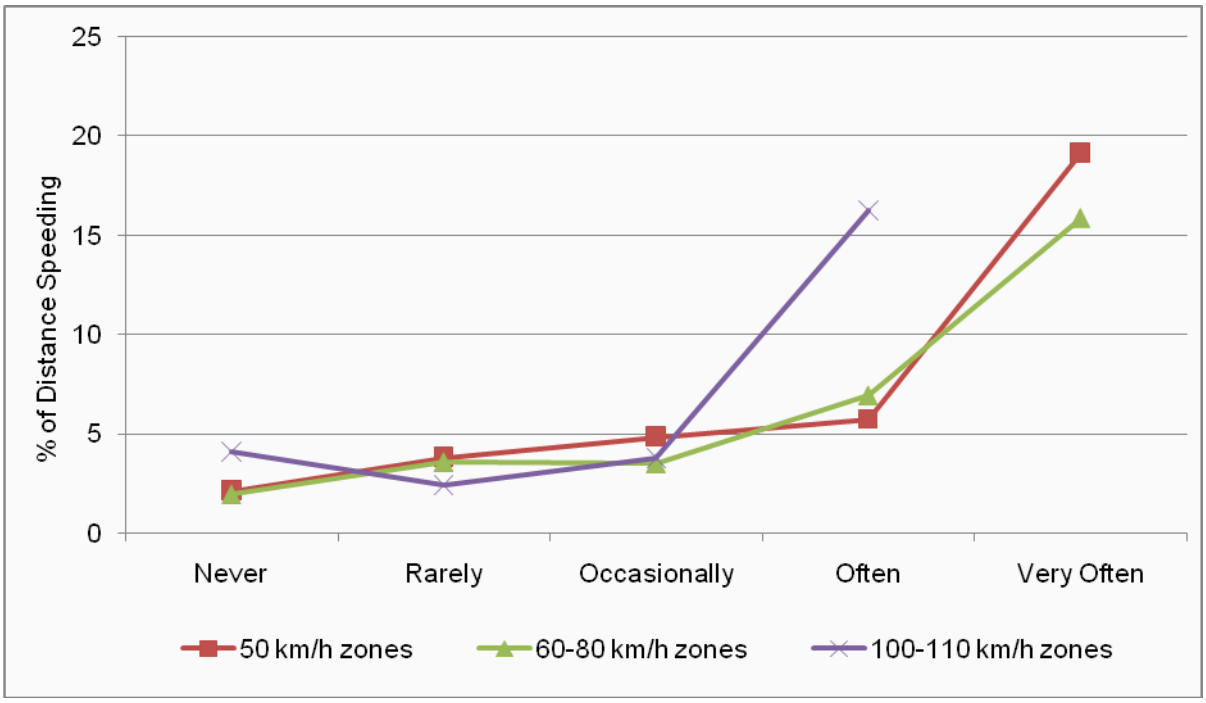

Figure 5 – Percentage of Distance Speeding by Speed Zone by Self-Reported Speeding Behaviour

To assess how actual speeding compares to self-reported speeding by personality and risk aversion, the GPS-based speeding information was correlated with the original variables – results are shown in Table 5. The weaker correlations than those in Table 3 (self-reported speeding) point to further evidence of differences in how drivers perceive their own behaviour compared to their actual behaviour. The other interesting insight is that as with the self-reported assessment different personality variables appear to influence behaviour in different situations. For instance efficacy appears to (marginally) be the primary driver of speeding per se and speeding in 60-80 km/h zones while excitement is the main issue behind speeding in 50 km/h zones.

Table 5 – Correlations between GPS-based speeding behaviour and personality variables

N=133	Mean	S.D.	1	2	3	4	5	6	7	8
GPS-Based Speed										
>1 km/h in 50 km/h zones	0.232	0.111	.310**	.083	-.109	.145	.070	.101	.060	-.212*
>1 km/h in 60-80 km/h zones	0.160	0.093	.411**	-.039	-.166	.160	.087	-.033	.244**	-.160
>1 km/h in 100-110 km/h zones	0.154	0.216	.065	-.062	.070	.054	-.020	-.090	.188	.077
>10 km/h in 50 km/h zones	0.049	0.052	.358**	.150	-.062	.210*	.065	.064	.052	-.145
>10 km/h in 60-80 km/h zones	0.034	0.037	.378**	-.004	-.083	.143	.043	-.078	.268**	-.022
>10 km/h in 100-110 km/h zones	0.019	0.053	.027	-.001	-.061	.101	.031	.011	-.089	.167
>20 km/h in 50 km/h zones	0.010	0.020	.323**	.029	-.027	.228**	.073	.059	.102	-.094
>20 km/h in 60-80 km/h zones	0.007	0.014	.250**	.044	-.026	.101	.048	-.081	.183*	.110
>20 km/h in 100-110 km/h zones	0.001	0.003	.074	.021	-.102	.036	-.021	.001	.053	.146

**Significant at 0.01 level (2-tailed); *Significant at 0.05 level (2-tailed)
1 = Speeding (composite scale); 2 = Aggression; 3 = Altruism; 4 = Excitement; 5 = Worry and Concern; 6 = Likelihood of Accident; 7 = Efficacy; 8 = Risk Aversion

CONCLUSIONS

This paper details an investigation into personality traits, self-reported speeding and actual speeding captured by a GPS device over several weeks for 133 motorists in Sydney, Australia. Among the most pertinent findings are the following. First, personality correlates with self-reported speeding behaviour suggest that aggression, excitement, and efficacy are all associated with more speeding per se while aversion to risk is associated with less speeding. This finding reinforces recent research (Machin and Sankey, 2008). However, what also emerged was that speeding behaviour in different speed zones appears to be influenced by different personality traits. Second, the empirical speeding data showed that while overall, 19 percent of the distance driven was spent above the speed limit, this disguised the substantial heterogeneity in speeding with a small, but notable number of drivers who regularly exceeded the speed limit by large magnitudes. Understanding more about the characteristics of these 'over-speeders' is the focus of further investigation. Third, comparisons between the self-reported and empirical speeding, reinforced the contention that drivers tend to misreport their propensity to speed (Hatfield et al. 2008). Fourth, personality correlates with actual speeding were much weaker than for self-reported speeding providing further evidence of differences in how drivers perceive their own speeding behaviour compared to their actual speeding behaviour.

Personality traits and risk perceptions are undoubtedly indicators of the self-stated 'desire' to speed but what is challenged here is how this relates to actual speeding behaviour. Clearly, the complication here is that actual speeding is impacted by a host of other factors (traffic, network, presence of speed cameras etc), which must be accounted for. Future work is focused on breaking out these other factors in an effort to more conclusively isolate the impacts of personality and risk perception on speeding.

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