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SPEEDING OR NOT SPEEDING? WHEN SUBJECTIVE ASSESSMENT OF SAFE, PLEASURABLE AND RISKY SPEEDS DETERMINES SPEEDING BEHAVIOUR

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Abstract

It is hypothesized that in a given situation speeding behaviour is determined by three subjective speed assessments: the speed perceived as the riskiest, the speed perceived as the safest, and the speed perceived as the most pleasurable. Specifically, if these assessments are high, drivers are expected to circulate faster. Such speed perceptions are also viewed as influenced by attitudes towards speed and speed limits. 177 car drivers, included 102 men and 75 women between 18 and 72 years ($M = 43$, $SD = 21$) and with a mean driving experience of 22 years ($SD = 19$), answered to a questionnaire about their attitudes towards speed and speed limits, the speeds they considered as the riskiest, the safest, and the most pleasurable in three different contexts, as well as their usual speed. Data analyses (ANOVA and path analyses) confirmed the influence of the three types of speed assessment on the usual speed and that the influence of attitudes on this behaviour is mediated by these three assessments. Results suggest that not only a change in attitudes and beliefs is desirable, but a concrete specification (e.g., 100 Km/h) of speeds perceived as safe, pleasurable and risky is also needed in order to reduce speeding behaviour.

Keywords: speeding; speed limit; speed assessment; attitudes; risk perception.

Resumen

Se presume que la conducción con exceso de velocidad está determinada por tres evaluaciones subjetivas de la velocidad: la velocidad percibida como de mayor riesgo, la velocidad percibida como la más segura, y la velocidad percibida como la más placentera. En concreto, si estas evaluaciones son elevadas, se espera que los conductores circulen más rápido. Tales percepciones de velocidad también se supone que están influidas por las actitudes hacia la velocidad y los límites de velocidad. En un estudio de campo, 177 conductores de automóviles, de los que 102 eran hombres y 75 mujeres, con edades comprendidas entre los 18 y 72 años ($M = 43$; $SD = 21$) y con una experiencia media de conducción de 22 años ($SD = 19$), respondieron a un cuestionario de preguntas sobre sus actitudes hacia la velocidad y los límites de velocidad, las velocidades que consideran como la de más riesgo, la más segura, y la más placentera en tres contextos diferentes, así como su velocidad habitual de conducción. El análisis de los datos (ANOVA y path análisis) confirmó la influencia de los tres tipos de evaluación de la velocidad en la velocidad habitual del conducción y que la influencia de las actitudes en ésta está mediada por estas tres evaluaciones. Estos resultados sugieren no sólo la necesidad de un cambio en las actitudes y creencias generales hacia la velocidad y los límites de velocidad, sino también la especificación de las velocidades concretas (v.gr., 100 Km/h) percibidas como seguras, agradables y de riesgo, con el fin de reducir el exceso de velocidad.

Palabras clave: exceso de velocidad; límite de velocidad; evaluación de la velocidad; actitudes, percepción del riesgo.

Introduction

Since the invention of the automotive, road safety has always been a major concern for governments. Among the many factors involved in road injuries, human factors are the most important. For instance, Sabey (1983) reveals that such factors are involved in 90% of road accidents and are the only factors involved in 65% of them. Two factors are specifically considered as the major cause of road injuries: Speeding and alcohol consumption. Several policies have been put in place to reduce such damaging impacts, but 1.3 million people still die annually on roads all over the world (World Health Organization, 2009). In the relationship between speeding and road fatalities, it has been established that reducing the speed of driving systematically reduces the number of road accidents (Finch, Kompfner, Lockwood, & Maycock, 1994; Salusjärvi, 1981; Taylor, Lynam, & Baruya, 2000). Consequently, one of the most important and widely adopted policies is that of *speed limitations*. However, given that drivers may or may not comply with such limitations, speeding remains an extensively frequent behaviour (Draskóczy & Mocsári, 1997), with a majority of drivers exceeding the limit by 10% (Delhomme & Cauzard, 2000). According to Corbett and Simon (1991) such behaviour constitutes a normative pressure which leads drivers to break the rules. Moreover, Corbett (2000) shows that much of drivers regard the act of speeding as *not a real crime*; they do not understand the doggedness of politicians and police about such minor offences. That is why a number of studies have attempted to identify the underlying psychological factors of speeding and researchers have actually developed different ways to anticipate and explain them.

One method consists in studying the perception of risk associated with speed. For instance, Wilde (1982) considers that drivers generally assess the risk associated with a given behaviour. They accept the risk when they think that their behaviour allows them to gain something (e.g. time, self-esteem, image, pleasure). According to Wilde, drivers are motivated to maintain a balance in the gain/loss ratio. More precisely, drivers do not adopt a given behaviour when the risk assessed equals loss rather than gain. Another approach is the *zero-risk* theory (Näätänen & Summala, 1976; Summala & Näätänen, 1988). According to this theory drivers are inclined to avoid risky situations, just as they are inclined to avoid all kinds of pain. In other words, they need to remain in a zero-risk situation in order to feel safe. They assess the risk associated

with several behaviours in a specific situation, and choose the less risky. Accidents then occur when the assessed risk is too different from the objective risk. Van der Molen and Bötticher (1988) use a third approach. They too emphasize the importance of perceived risk in behaviour. But they also identify two different kinds of motivations. They believe in the existence of safety motivations that encourage drivers to be careful and adopt safe behaviours. They also believe in the existence of non-safety motivations (such as being in a hurry, getting pleasure out of speeding, etc.) that encourage drivers to adopt risky behaviours. Finally, Musselwhite (2006) focuses on the underlying reasons for adopting risky behaviours. He identifies several types of drivers. To some, risky behaviours are a way of satisfying personal needs. For instance, some drivers may feel it is right to take risks when they have something to gain (time, a better image, self-esteem, etc.); others feel that taking risks will help reduce the pressure they experience (because of fatigue, because they are late or lost); others yet will simply find pleasure in dangerous behaviour (seeking sensations, breaking the law).

Such approaches all emphasize risk assessments and a number of underlying motivations (to avoid or seek risk, to find pleasure, or to satisfy other needs). Therefore, it was hypothesized that drivers' speeding behaviours are directly related to three types of speed assessments. *The riskiest speed*: the higher they assess the speed associated with risk, the more they speed. *The safest speed*: the higher they assess the speed associated with safety, the more they speed. *The most pleasurable speed*: the higher they assess the speed associated with pleasure (i.e. that satisfies internal needs, whatever they may be), the more they speed.

Factors with a potential influence on these supposed speed assessments were also examined. More precisely, the potential influence of drivers' attitudes towards speed and speed limits was considered. According to Eagly and Chaiken (1993) an attitude refers to "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (p. 1). As early mentioned by Allport (1935), an attitude is a state of readiness which influence individual's responses, like evaluations of events/situations and behaviours. Indeed, attitudes are generally considered to influence the perception of reality, in the sense that individuals are motivated to perceive their environment in a congenial perspective (Kunda, 1990; Lord, Ross, & Lepper, 1979). In other words, attitudes have a *knowledge function* (see Shavitt, 1989), they give the world meanings which are consistent with them. For

instance, Lord et al (1979) observed that one's attitude towards capital punishment – whether positive or negative – affects one's perception of studies about the consequences of such legal action. Individuals perceive those studies that support their position as more convincing and dependable than those that undermine their position. Within the road safety framework, several studies illustrate the influence of attitudes towards speed and speed limits on speeding behaviour (De Pelsmacker & Janssens, 2007; Forward, 1997; Iversen, 2004; Lahaussé, Van Nes, Fildes, & Keall, 2010; Letirand & Delhomme, 2005; Newman, Watson, & Murray, 2004; Parker, 1997; Parker et al., 1992; West & Hall, 1997). These studies show that driver's attitudes towards both speed and speed limits determine the adopted speed (i.e. drivers who have a positive attitude towards speed and a negative attitude towards speed limits are inclined to speed).

According to that theoretical framework, the following study was designed to test a model which can be summarized as follows:

attitudes → speed assessments → adopted speed

This model presupposes that drivers under the influence of attitudes towards speed and speed limits, when placed in a given situation, produce assessments of the riskiest, safest, and most pleasurable speeds, in order to adopt the speed they consider most appropriate.

More precisely, it is based on four basic hypotheses:

Firstly, several theories and models of risk perception (Musselwhite, 2006; Summala & Näätänen, 1988; Van der Molen & Bötticher, 1988; Wilde, 1982) insist on the subjective assessment of risk, as well as on safety and hedonic motivations which can incite drivers to take risk (e.g. speeding) or to be careful (e.g. complying with speed limits). Thus, in accordance with the common assumptions of such theoretical approaches, it is assumed that drivers assess the safest, most pleasurable and riskiest speeds in a given situation, in order to cope with. Then, it is further assumed that these three speed assessments determine the speed generally adopted by drivers (which is less or more risky).

Secondly, mentioned past researches (De Pelsmacker & Janssens, 2007; Forward, 1997; Iversen, 2004; Lahaussé et al., 2010; Letirand & Delhomme, 2005; Newman et al., 2004; Parker, 1997; Parker et al., 1992; West & Hall, 1997) suggest that attitudes towards both speed and speed limits determine the speed generally adopted.

Specifically, more the attitudes are positive towards speed and negative towards speed limits, more the drivers go fast. This is also in line with the instrumental function of attitudes (see Eagly & Chaiken, 1993; Shavitt, 1989).

Thirdly, it is assumed that attitudes towards both speed and speed limits have an effect on the speed perceived as the safest, the speed perceived as the most pleasurable and the speed perceived as the riskiest. This hypothesis relies on the existing literature illustrating the knowledge function of attitudes (e.g. Kunda, 1990; Lord et al., 1979; Shavitt, 1989). Attitudes influence the appraisal of situations and events related to the relevant objects (e.g. speed, speed limits and so on). Thus, different attitudes lead to different appraisal of such events/situations.

Finally, it is anticipated that the speed perceived as the safest, the speed perceived as the most pleasurable and the speed perceived as the riskiest mediate the influence of attitudes towards speed and speed limits on the speed generally adopted. This is in line with the idea that attitudes foster behavioural responses by motivating and orienting appraisal of events, situations or entities (see Shavitt, 1989). In that view, an attitude predicts behaviour indirectly, while appraisal of situations is a direct predictor.

Method

Participants

One hundred and seventy-seven car drivers, included 102 men and 75 women between 18 and 72 years ($M = 43$, $SD = 21$) participated in the research. The respondents had been legally driving for an average period of 22 years ($SD = 19$ years). Annual mileage was on average 2.97 (on a scale of 1 to 5), which translates into an annual mileage of 15001 to 20000 km/year (response 3) ($SE = 0.08$).

Procedure and design

Respondents were recruited in areas, and were individually invited to respond in all honesty to questions about driving. Participants were invited to answer the following questions chronologically. First, a single item with a seven point scale assessed the drivers' attitude towards speed (*to me speed is: totally negative; negative; fairly negative; neither positive nor negative; fairly positive; positive; totally positive*). Next,

a single item with a seven point scale assessed the drivers' attitude towards speed limits (with a similar choice of answers). Then, they had to specify the speed they considered as the safest, the speed they considered as the most pleasurable, and the speed they considered as riskiest when exceeded, in three types of situation: Driving in urban areas with a speed limit of 50 Km/h, driving in rural areas with a speed limit of 90 Km/h and driving on motorways with a speed limit of 130 Km/h. Finally, participants had to specify their usual average driving speed in the three given situations.

Respondents with negative and positive attitudes were distinguished on the basis of a median split (*median for speed* = -1.00; *median for speed limits* = 1.00). Sixty-one respondents had a negative attitude towards speed and a positive attitude towards speed limits, thirty-three had a positive attitude towards speed and a positive attitude towards speed limits, twenty-nine had a negative attitude towards speed and a negative attitude towards speed limits, and fifty-four had a positive attitude towards speed and a negative attitude towards speed limits.

The chosen dependent variable was the difference between the speed limit and the speed stated by the participant. For instance, when a participant admitted driving at a speed of 110 Km/h on a road limited at 90 Km/h, the score obtained was equal to $110 - 90 = 20$. In that way, it was possible to study the differences between speed limits and the driver's assessed or adopted speed.

Results

The speed usually adopted

The differences between usual speeds and the speed limits were analysed using a 2 (attitude towards speed: negative vs. positive) X 2 (attitude towards speed limits: negative vs. positive) X 3 (road type: urban vs. rural vs. motorway) ANOVA, with the two first factors (attitude towards speed and attitude towards speed limits) as between-participants and the last factor (road type) as within-participants. Because of violation of the sphericity assumption (significant Mauchly's *W* tests), univariate results for within-participants effects are reported with adjusted degrees of freedom according to Greenhouse-Geisser correction (see Tabachnick & Fidell, 2007). However, for clarity of presentation, standard degrees of freedom are also reported in parentheses.

Complementarily, as recommended by Tabachnick & Fidell (2007), multivariate results are given below. Pillai's *Trace* statistic is used instead of Wilks' λ because of unequal covariance matrices (significant Box's *M* test). Tables 1 and 2 display corresponding results.

Such an analysis reveals a main effect of attitude towards speed, a main effect of attitude towards speed limits, a main effect of road type and an interaction effect between attitude towards speed limits and road type. The speed generally adopted is further from the speed limits among participants with a positive attitude towards speed ($M = 4.87$) than among participants with a negative attitude ($M = 1.54$), and among participants with a negative attitude towards speed limits ($M = 5.24$) compared to participants with a positive attitude ($M = 1.17$). The usual speed also deviates more importantly from the speed limits on rural roads ($M = 4.76$) than on other types of road ($M = 2.68$ and $M = 2.14$, for urban roads and motorways, respectively). Tukey's post-hoc tests confirm that the difference between urban roads and motorways is non-significant, while their differences with the rural context are significant ($p < .01$ for urban roads and $p < .001$ for motorways). In the interaction between attitudes towards speed limits and road types, differences between participants with different attitudes are maximized when driving on motorways ($M = -1.08$ vs. $M = 5.37$, positive and negative, respectively), and minimized when driving on urban roads ($M = 3.05$ vs. $M = 6.52$ positive speed limits and negative speed limits, respectively). Differences observed on rural roads are comparatively of medium importance ($M = 6.86$ vs. $M = 11.26$, positive and negative, respectively).

More generally, participants with a positive evaluation of speed and a negative evaluation of speed limits adopt higher speeds than other drivers. The results observed here are very similar to the previous results thus confirming the second hypothesis.

Table 1. Between-participants effects of the mixed analysis of variance of the difference between usual speed and the speed limit.

Source	<i>F</i>	<i>df</i>	<i>p</i>
Intercept	46.51	1	.001
Attitude speed	12.51	1	.001
Attitude speed limits	18.72	1	.001
Att. speed x			
Att. speed limits	0.38	1	<i>ns</i>
Error		173	

Table 2. Within-participants effects of the mixed analysis of variance of the difference between usual speed and the speed limit.

Source	Univariate statistics			Multivariate statistics ^a		
	<i>df</i> ^b	<i>F</i>	<i>p</i>	<i>Pillai's Trace</i>	<i>df</i>	<i>p</i>
Road type	1.82, 314.46 (2, 346)	8.86	.001	.12	2, 171	.001
Att. speed x Road	1.82, 314.46 (2, 346)	0.18	<i>ns</i>	.00	2, 171	<i>ns</i>
Att. speed limits x Road	1.82, 314.46 (2, 346)	5.23	.01	.04	2, 171	.05
Att. speed x Att. speed limits x Road	1.82, 314.46 (2, 346)	0.79	<i>ns</i>	.01	2, 171	<i>ns</i>

Note. ^a Multivariate statistics only concern effects of within-participants variables; ^b Degrees of freedom (*df*) with Greenhouse-Geisser correction are presented without parentheses. Standard *df* are in parentheses.

An additional analysis was performed. The mean score of the three safest speeds, the mean score of the three most pleasurable speeds and the mean score of the three riskiest speeds were calculated and included as covariates. This analysis reveals

that when effects of these three speed assessments are statistically controlled, effects of attitudes on the usually adopted speed are non-significant, $F(1, 170) = 0.14$, *ns*, for the attitude towards speed, $F(1, 170) = 0.68$, *ns*, for the attitude towards speed limits, $F(1, 170) = 0.98$, *ns*, for the interaction of both attitudes. Inversely, effects of the three speed assessments are significant, $F(1, 170) = 35.87$, $p < .001$ for the mean pleasurable speed, $F(1, 170) = 22.84$, $p < .001$ for the mean riskiest speed, $F(1, 170) = 5.87$, $p < .02$ for the mean safest speed. This result confirms the first hypothesis (effect of the three speed assessments on the usual speed) and gives credit to the fourth hypothesis (effects of attitudes on speeding behaviour are mediated by the three speed assessments), because it corroborates the idea of indirect effects of attitudes (see Baron & Kenny, 1986, for more details concerning this statistical rationale).

Subjective assessments of safe, pleasurable and risky speeds

The differences between assessed speeds and the speed limits were analysed using a 2 (attitude towards speed: negative vs. positive) X 2 (attitude towards speed limits: negative vs. positive) X 3 (road type: urban vs. rural vs. motorway) X 3 (assessment type: safest vs. most pleasurable vs. riskiest speed) ANOVA, with the two first factors (attitude towards speed and attitude towards speed limits) as between-participants, while the two last factors, namely road type and assessment type, are within-participants. For the same reasons that the previous ANOVA, univariate results for within-participants effects are reported with adjusted degrees of freedom according to Greenhouse-Geisser correction and multivariate results are based on Pillai's Trace statistic. Tables 3 and 4 display obtained results.

Table 3. Between-participants effects of the mixed analysis of variance of the difference between assessed speed and the speed limit.

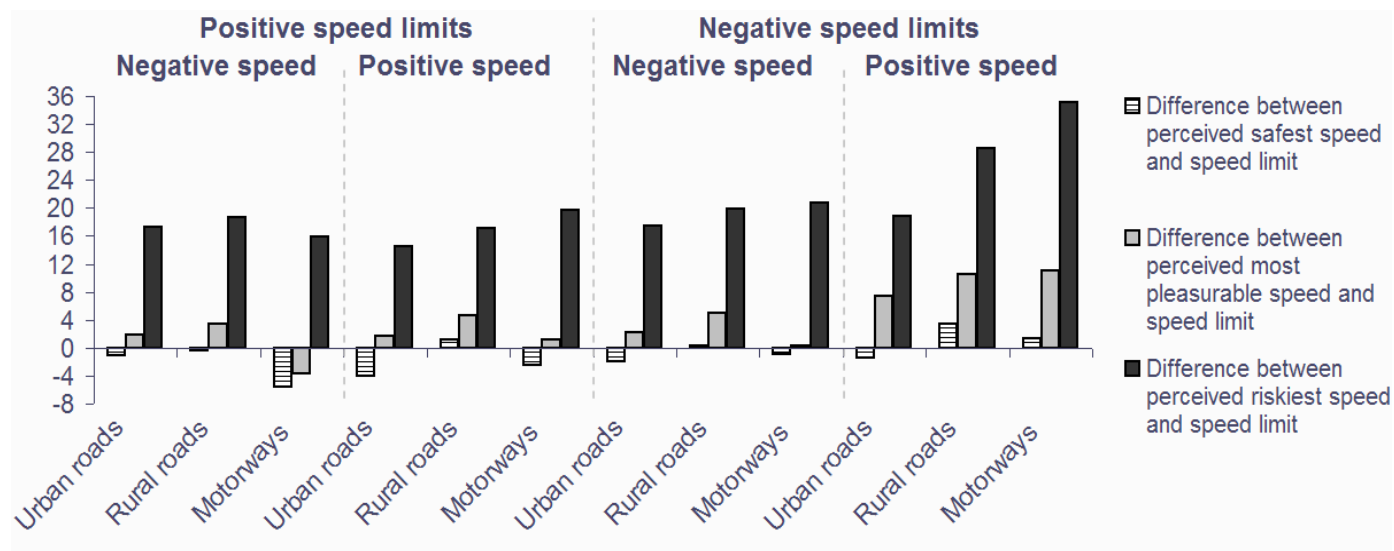
Source	<i>F</i>	<i>df</i>	<i>p</i>
Intercept	223.30	1	.001
Attitude speed	16.29	1	.001
Attitude speed limits	25.78	1	.001
Att. speed x Att. speed limits	3.18	1	<i>ns</i>
Error		172	

Table 4. Within-participants effects of the mixed analysis of variance of the difference between assessed speed and the speed limit.

Source	Univariate statistics			Multivariate statistics ^a		
	<i>df</i> ^b	<i>F</i>	<i>p</i>	<i>Pillai's Trace</i>	<i>df</i>	<i>p</i>
Road type	1.64, 281.53 (2, 344)	15.33	.001	.21	2, 171	.001
Assessment type	1.41, 241.93 (2, 344)	405.89	.001	.78	2, 171	.001
Att. speed x Road	1.64, 281.53 (2, 344)	6.09	.01	.05	2, 171	.05
Att. speed limits x Road	1.64, 281.53 (2, 344)	3.59	.05	.03	2, 171	<i>ns</i>
Att. speed x Assessment	1.41, 241.93 (2, 344)	2.54	<i>ns</i>	.07	2, 171	.01
Att. speed limits x Assessment	1.41, 241.93 (2, 344)	3.71	.05	.05	2, 171	.05
Road x Assessment	2.92, 501.63 (4, 688)	15.36	.001	.18	4, 169	.001
Att. speed x Att. speed limits x Road	1.64, 281.53 (2, 344)	1.08	<i>ns</i>	.01	2, 171	<i>ns</i>
Att. speed x Att. speed limits x Assessment	1.41, 241.93 (2, 344)	2.29	<i>ns</i>	.04	2, 171	.05
Att. speed x Road x Assessment	2.92, 501.63 (4, 688)	2.52	<i>ns</i>	.05	4, 169	.05
Att. speed limits x Road x Assessment	2.92, 501.63 (4, 688)	1.22	<i>ns</i>	.02	4, 169	<i>ns</i>
Att. speed x Att. speed limits x Road x Assessment	2.92, 501.63 (4, 688)	2.65	.05	.06	4, 169	.05

Note. ^a Multivariate statistics only concern effects of within-participants variables. ^b Degrees of freedom (*df*) with Greenhouse-Geisser correction are presented without parentheses. Standard *df* are in parentheses.

Figure 1. Assessed speed as a function of attitudes towards speed and speed limits, road type, and assessment type.

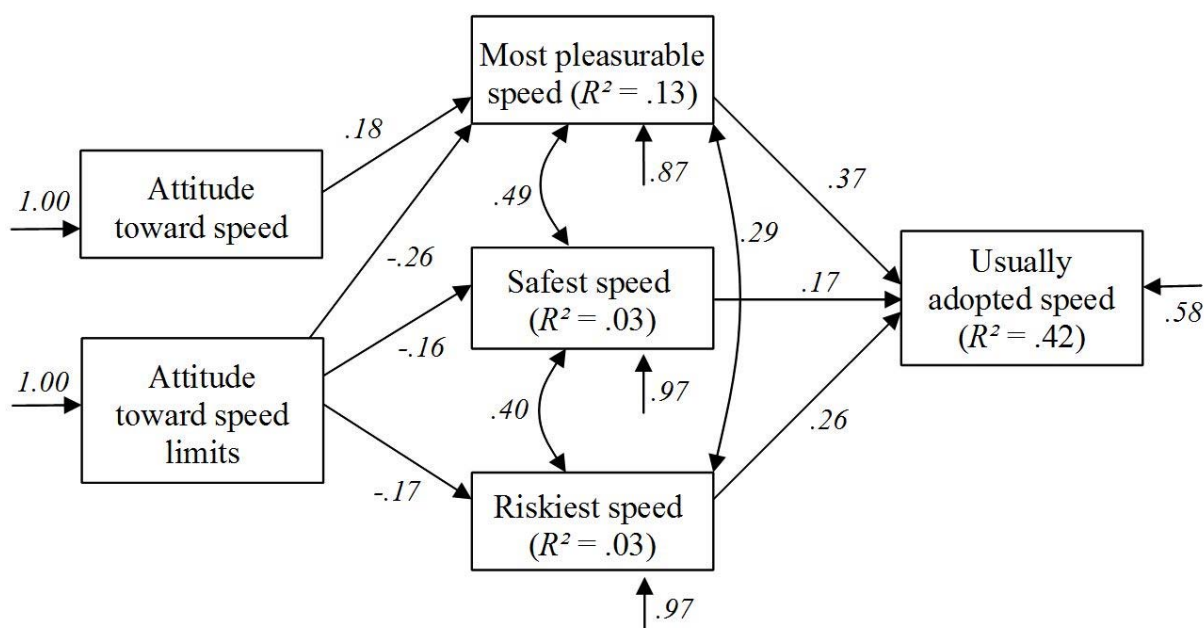


First, there are significant main effects of attitudes towards speed ($M = 9.36$ and $M = 5.38$, for positive and negative attitudes towards speed, respectively) and towards speed limits ($M = 4.87$ and $M = 9.87$, for positive and negative attitudes towards speed limits, respectively). Thus, as expected by hypothesis 3, positive attitude towards speed and negative attitude towards speed limits induce higher speed assessments than negative attitude towards speed and positive attitude towards speed limits. There are also main effects of road type and assessment type. Speed assessment deviates more importantly from the speed limit on rural roads ($M = 9.06$) and motorways ($M = 7.74$) than on urban roads ($M = 5.31$). Tukey's post-hoc tests reveal that difference between rural roads and motorways is non-significant, while their differences with the urban context are significant, $p < .001$. According to Tukey's post-hoc tests, the speed perceived as the safest ($M = -1.28$) is significantly less important, $p < .001$, than the most pleasurable ($M = 3.51$) and the riskiest ($M = 19.88$) speeds; while these two last assessment types differ significantly, $p < .001$. Other significant results are revealed. For instance, the effect of attitude towards speed and, to a lesser extent, of attitude towards speed limits is moderated by the type of road. Differences between participants with different attitudes are maximized on motorways ($M = 10.99$ vs. $M = 4.98$, positive and negative speed, respectively; $M = 4.20$ vs. $M = 11.28$, positive and negative speed limits, respectively), and minimized on urban roads ($M = 6.18$ vs. $M = 4.44$, positive

and negative speed, respectively; $M = 3.54$ vs. $M = 7.08$, positive and negative speed limits, respectively). Differences observed on rural roads are comparatively of medium importance ($M = 10.91$ vs. $M = 7.22$, positive and negative speed, respectively; $M = 6.86$ vs. $M = 11.26$, positive and negative speed limits, respectively). The analysis of the four-way interaction also provides interesting information.

As exhibited by Figure 1, the assessed speed massively increases for participants with a positive attitude towards speed and a negative attitude towards speed limits on rural roads and motorways, compared to other drivers. Differences are especially high for speed perceived as the riskiest and, to a lesser extent, for speed perceived as the most pleasurable. This result may shed light on the conditions which incite drivers to disregard speed limits.

Figure 2. Path analysis results. Influences of attitudes towards speed and speed limits on the speed usually adopted on urban roads are mediated by the three subjective speed assessments.

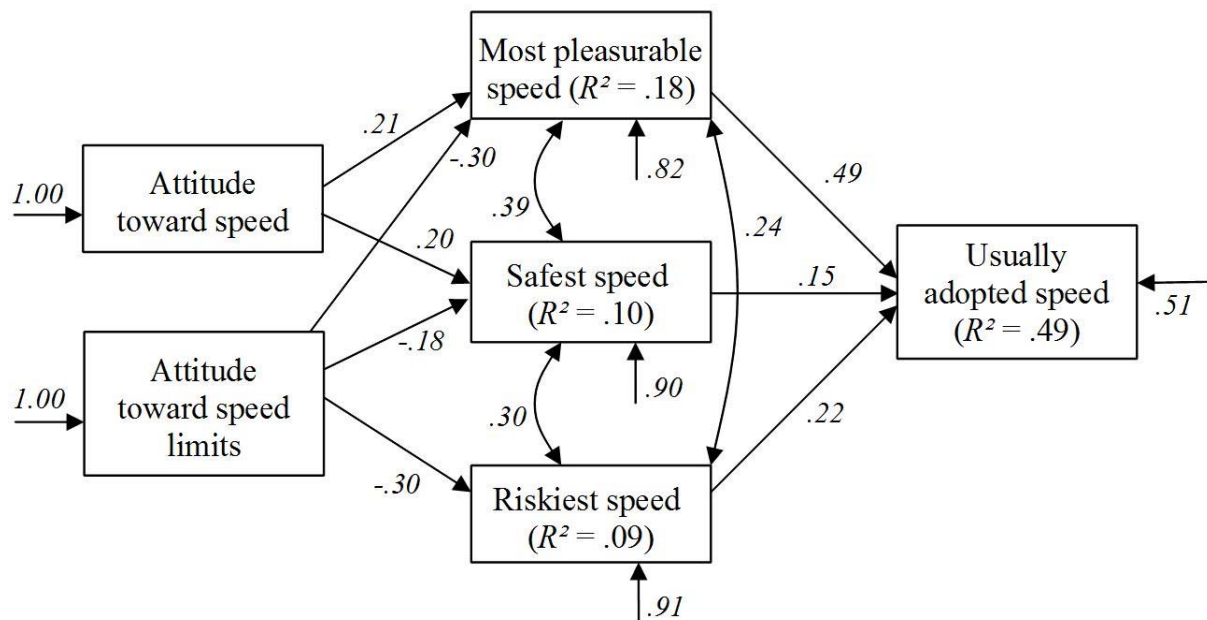


Causal analyses

In order to fully test the fourth hypothesis, assuming that the effects of attitudes on speeding behaviour is mediated by the three speed assessments, three path analyses using LISREL 8 (Jöreskog & Sörbom, 2001) with Maximum Likelihood method were

performed. Results are presented below (see Figure 3), one for each type of road. It is assumed that the speed perceived as the safest, the speed perceived as the most pleasurable and the speed perceived as the riskiest mediate the influence of attitudes towards speed and speed limits on the speed generally adopted. Initially, the analyses reveal a good fit, but they also reveal one or two non-significant paths. These models were finally tested without such paths. Figures 2, 3 and 4 summarize the results obtained.

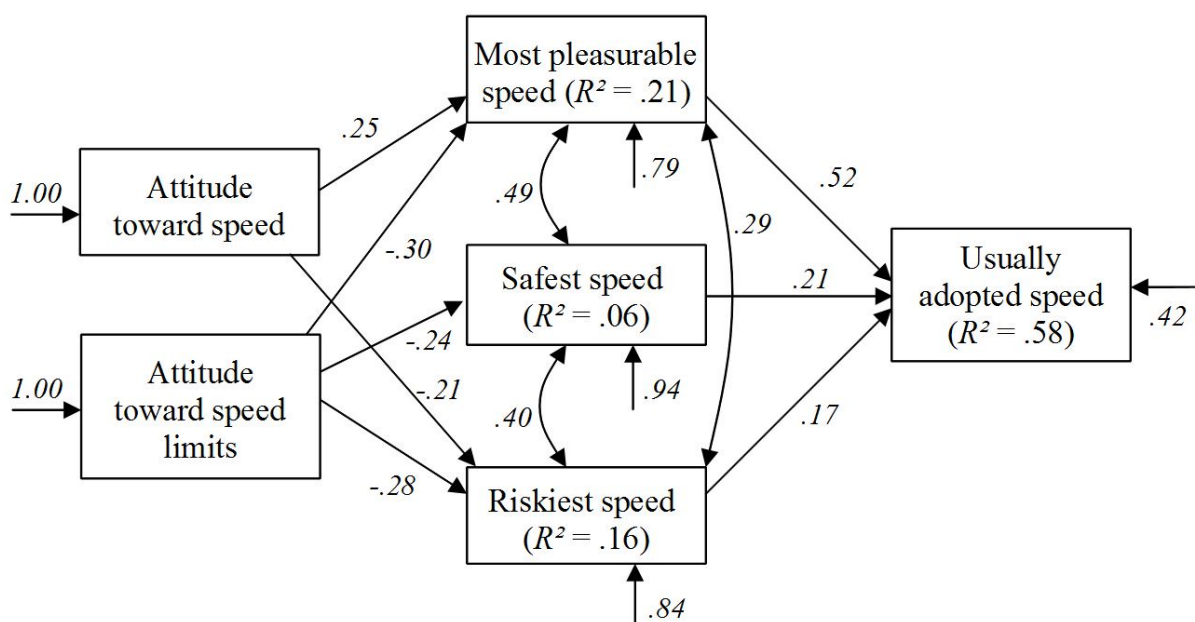
Figure 3. Path analysis results. Influences of attitudes towards speed and speed limits on the speed usually adopted on rural roads are mediated by the three subjective speed assessments.



The three models fit the data well, as the reported indexes confirmed (on urban roads: $\chi^2 = 5.32$, $p = .26$, RMSEA = .04, SRMR = .04, GFI = .99, AGFI = .95, CFI = 1.00, NNFI = .98; on rural roads: $\chi^2 = 4.11$, $p = .25$, RMSEA = .05, SRMR = .04, GFI = .99, AGFI = .95, CFI = 1.00, NNFI = .98; on motorways: $\chi^2 = 5.54$, $p = .14$, RMSEA = .07, SRMR = .04, GFI = .99, AGFI = .93, CFI = .98, NNFI = .97). The three models also explain an important part of the self-reported usual speed (on urban roads: $R^2 = .42$; on rural roads: $R^2 = .49$; on motorways: $R^2 = .58$). These results confirm the influences of attitudes towards speed and speed limits on the generally adopted speed, and the fact

that such influences are fully mediated by the three speed assessments in this way verifying the fourth hypothesis. It should be noted that the influence of attitudes towards speed on speed assessments is more fluctuant than the influence of attitudes towards speed limits. It should also be noted that a great part of the variance in speed assessments is not explained by the two attitudinal measures (R^2 statistics are always lower than .21). Finally, on all types of roads, the best overall predictor of the speed generally adopted is the speed perceived as the most pleasurable.

Figure 4. Path analysis results. Influences of attitudes towards speed and speed limits on the speed usually adopted on motorways are mediated by the three subjective speed assessments.



Discussion

In order to better understand speeding behaviours, a number of theoretical frameworks focus on risk perception, in the sense that the less speeding behaviours (i.e. exceeding speed limits) are considered risky the faster the driving. They also underline the importance of motivations in the decision on whether or not to take speeding risks. More specifically, drivers seem more or less motivated to play it safe or to satisfy personal needs when they drive. So, it was hypothesized that in a given situation,

drivers assessed the riskiest speed (the speed they consider as really dangerous when exceeded), the safest speed, and the most pleasurable speed (that satisfies their personal needs in a given situation). It was also hypothesized that the speed they usually adopt is determined by such assessments. Considering the knowledge function of attitudes, it was finally argued that attitudes towards speed and speed limits influence such assessments. Empirical studies confirmed all these assumptions.

The interest in the present approach lies in bringing to light the influence of the subjective construction of speed. Individuals not only view speed as globally risky, safe or pleasurable but it is assumed that most drivers associate those labels to a more or less *concrete* high speed. For instance, it is interesting to note that drivers generally assess the safest speed as the closest speed to the authorized limit (see Figure 1). In theory, however, exceeding the speed limit is, in a given situation, considered to be risky. The discrepancy between the authorized speed (speed limit) and the speed perceived as risky (the speed drivers consider as really dangerous when exceeded) is important and meaningful. It is particularly significant among drivers with negative attitudes towards speed limits and positive attitudes towards speed (see Figure 1). These are also the fastest drivers. Results also confirm the important influence of the three speed related assessments on the self-reported speed (see Figures 2, 3 and 4). Therefore, from an applied viewpoint, the interest of the present method is to identify such speed related assessments in order to understand speeding behaviours. Once identified, these assessments should be manoeuvred by researchers and road safety experts in a safer (more objective) way.

Results favour the proposed approach. However, empirical study is not exempt of limitations. To begin with, the speeds usually adopted by drivers in the three manipulated situations are self-reported. Studies of Åberg, Larsen, Glad, and Beilinson (1997), Corbett (2001), and Parker (1997) demonstrate that the correlation between self-reported speed and observed speed is moderately significant. Such imprecision of the self-reported measure does not call into question empirical findings, but puts forward the necessity to replicate this study with an observed measure of speed. The second limitation to be underlined is that the present approach does not specify the probable relations between speed assessments and others factors generally considered as determining speeding behaviour. This is specifically the case of the key-factors of the theory of planned behaviour (Ajzen, 1985, 1991). Effectively, several studies repeatedly

illustrate the influence of such factors on speeding behaviour (Åberg, 1997; Åberg, 2001; Åberg & Wallén-Warner, 2008; Conner, Lawton, Parker, Chorlton, Manstead, & Stradling 2007; Forward, 2006; Letirand & Delhomme, 2005; Parker, Manstead, Stradling, Reason, & Baxter, 1992; Stradling & Parker, 1997; Wallén-Warner & Åberg, 2006). It would be especially interesting to study the influence of *subjective norm* and *perceived behavioural control* on the produced assessments. Moreover, attitudes towards speed and speed limits moderately explain the variance of drivers' assessments. This suggests the existence of other contributing factors which could be relevant. It could be also relevant to study the influence of individual differences. For instance, a more dispositional approach of speeding behaviour is developed by a set of studies about *driving styles* (Bristow, Kirwan, & Taylor, 1982; French, West, Elander, & Wilding, 1993; West, French, Kemp, & Elander, 1993). Driving behaviours could be considered as under the influence of individual dispositions to decide and to act. Speeding, like other targeted behaviours, thus becomes a component of a driving style, produced by a decision-making style unrelated to driving activity (West, Elander, & French, 1993). It is probable that different styles of deciding and acting generate different speed assessments.

Despite these limitations, this study succeeds in showing that speed is subjectively constructed, and that this subjective construction influences speeding behaviour. Further research is necessary to complete and reinforce these results.

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