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The effect of norms, attitudes and habits on speeding behavior: Scale development and model building and estimation

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Abstract

In a quota sample of 334 Belgian individuals, reliable and valid scales are developed, that measure subjective, personal, normative and descriptive norms, personal identity, attitude components, perceived behavioral control, habit formation, behavioral intention and behavior with respect to speeding. A speeding behavior model is built in which the relevance of personal, descriptive and normative norms, the cognitive and affective attitude towards speeding, the affective attitude towards speed limits, and habit formation is assessed. Habit formation and the attitude towards speeding influence the intention towards speeding and self-reported speeding. Personal and to a lesser extent subjective and descriptive norms have a significant effect on attitudes towards speeding and on self-reported speeding. Recommendations for more effective and efficient anti-speeding campaigns are formulated.
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Keywords: Speeding scale development; Speeding behavior modeling; Norms

1. Introduction

Speeding is the most frequent traffic offence, and is responsible for many severe accidents (Aberg et al., 1997; Carcary et al., 2001). A lot of research has been carried out about the effect of anti-speeding campaigns on speeding behavior and on potential intermediate determining factors of speeding, such as subjective, personal and descriptive norms, attitudes towards speeding and anti-speeding and traffic safety campaigns, habit formation and perceived behavioral control (PBC) (Fockler and Cooper, 1990; Connolly and Aberg, 1993; Aberg et al., 1997; Rothengatter, 1997; Aberg, 2002, 2003). However, a consistent set of reliable and valid scales to measure these intermediate effects has to date not been developed yet, and only partial models of speeding behavior have been proposed and tested. Developing a model that explains speeding behavior, taking a number of important determining variables of speeding into account, and that is based on reliable and valid scales, would allow to develop a tracking instrument on the basis of which effective anti-speeding campaigns could be developed and by means of which their effectiveness could be tracked (Aberg, 2003).

The purpose of this study is to build and to estimate a model that assesses the influence of factors that directly or indirectly determine speeding behavior, and to develop valid and reliable scales to measure these factors. The backbone of this model is the constructs of the theory of planned behavior. Additionally, the role of normative, descriptive and personal norm and the personal identity with respect to speeding and of habit formation are also investigated. Construct development and model building are based on a sample of 334 Belgian car drivers. Implications for better speeding campaigns are discussed.

In the next section a summary of the literature on the determining factors of speeding behavior is given, leading to the proposed behavioral model. Next the research method and data collection procedure of this study are discussed. The scale development process is highlighted in Section 4. In Section 5 the estimation results of the explanatory model of speeding behavior is built. These results are discussed in Section 6. The final section offers conclusions, policy recommendations and limitations and suggestions for further research.

2. Determining factors of speeding behavior

The theory of reasoned action (TORA) and its extension, the theory of planned behavior (TPB) are frameworks that are

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frequently used in traffic behavior studies. In the TORA behavioral intention is determined by the attitude of the individual towards the behavior and his or her subjective norm. Attitudes are in turn composed of behavioral beliefs and outcome evaluations (the importance of each belief). The subjective norm stands for perceived social pressure by significant others or reference groups. It is determined by normative beliefs (the perceived opinion of significant others) and the motivation to comply with these perceptions (Fhaner and Hane, 1973; Ajzen and Fishbein, 1980; Jonah and Dawson, 1982; Aberg, 2002; Ajzen, 1985, 2001, 2002). The TORA starts from the assumption that attitudes determine intentions and that the latter determine behavior (Fishbein and Ajzen, 1975). However, in reality there is often an attitude–behavior(al intention) gap. A way to offer an explanation for the lack of explanatory power of attitudes, subjective norms and behavioral intentions is provided by the theory of planned behavior. This model states that, besides attitudes and subjective norms, intentions and behavior are also determined by perceived behavioral control (PBC), i.e. '*the degree to which an individual feels that performance or non-performance of the behavior in question is under his or her volitional control*' (Parker et al., 1992:94). PBC is determined by control beliefs (beliefs about factors that can facilitate or restrict the intended behavior) and perceived power (the perceived impact of these factors) (Levelt and Swov, 1998; Ajzen, 2002). The impact of PBC will probably be more important if the behavior is not 'new', but based on experience. The TPB, or adaptations of it, is the most often used theoretical framework of models explaining traffic safety behavior (Levelt and Swov, 1998).

In the TPB *affective components of attitudes* are not explicitly taken into account. The 'attitude' factor in this model is determined by cognitive beliefs and the relative importance that is attached to them (action is reasoned and planned). However, attitudes are generally defined as consisting of cognitive and affective components or antecedents (Eagly and Chaiken, 1993). For instance, people may rationally understand that a certain behavior (like speeding) is wrong or dangerous, but at the same time they may like speeding, because it gives them a good feeling, or because they perceive that in the end they will feel better (Manstead and Parker, 1995; Stradling and Parker, 1997; Manstead et al., 2002). Similarly, negative emotions may prevent them from engaging in behavior that seems otherwise rational (for instance, you are afraid of speeding, despite the fact that you think there is nothing wrong with it). Parker et al. (1992), Rothengatter (1993) and Levelt and Swov (1998) conclude that cognitive as well as affective attitude components have a significant impact on speeding intentions and behavior. Moreover, attitudes may consist of various affective and cognitive dimensions. Besides general cognitive and affective attitudes, also the attitude towards accident probability (Connor and Abraham, 2001; Elliot, 2001), speed limits or other legal constraints (Loo, 1984; Lehner, 1998; Cauzard and Quimby, 2000; Mitchell and Taverner, 2000) and speed controls (Levelt and Swov, 1998; Lehner, 1998; Cauzard and Quimby, 2000; Elliot, 2001) have been shown to have a significant impact on speeding intention and behavior.

In previous research, a number of important factors have been proposed that are not captured by the traditional TPB-model constructs, but that in previous research have proved to be relevant in explaining traffic safety behavior. A first important factor is 'past behavior' or 'habit formation'. Indeed, *habit formation* based on past behavior may be one of the factors responsible for the attitude–behavior gap (Wittenbracker et al., 1983; Rothengatter, 1993). As Mittal (1988:996) states: '*many well learned skills are performed almost automatically*'. Bentler and Speckart (1979) already proposed an extended TORA model in which past behavior or habits additionally determined intentions and behavior. Budd et al. (1984) and Mittal (1988) established that both attitudes and habits had a significant impact on safety belt wearing. Habit formation and perceived behavioral control can both partly account for the attitude–behavior gap in that they both can have an impact on behavioral intentions and behavior directly. However, in principle they measure different things. Habit formation leads to 'automatic' or learned behavior, while (lack of) PBC is a cognitive factor that may deliberately lead to a certain behavior. Therefore, both constructs can play a role in explaining traffic safety behavior.

Recent models increasingly stress the importance of different types of norms as determining factors of attitudes. The *subjective norm* is already part of the TPB, and reflects the perceived social pressure (what individuals believe other people think they should do). According to the TPB, the perceived opinion of significant others (subjective norm) can influence intentions and behavior. However, in a traffic situation, these significant others are often not present and their effect on behavior could therefore be absent or minimal. However, people may infer the opinion or norm of others (for instance, other people on the road) from their behavior, and may be influenced by it (Aberg, 1997; Ajzen, 2001). This factor is called the *normative norm*. Furthermore, people may or may not speed because others do it or not. Various studies show that behavior of others on the road is imitated (Rothengatter, 1991; Connolly and Aberg, 1993; Groeger and Chapman, 1997). This factor is called the *descriptive norm* (Elliot, 2001; Donald and Cooper, 2001). For instance, Aberg (1999) concludes that, depending on the speed, in Sweden 10–30% of behavior is explained by the normative and descriptive norm and only 6–10% by the subjective norm. In the same study, attitudes accounted for 19–46% of speeding behavior, and perceived behavioral control for 35–49%. Elliot (2001) identifies the *personal norm* as the moral values that people think of as important (what they personally think they should do). Before engaging in a certain behavior they will consider the consequences for their self-image. If a certain behavior is inconsistent with their personal norm, the anticipated regret related to a certain behavior will prevent them from doing it (Manstead and Parker, 1995; Connor and Abraham, 2001; Newman and Di Pietro, 2001). The combination of engrained moral values and anticipated regret (jointly called the personal norm) are two sub-factors that are highly correlated (Elliot, 2001). They may have a significant impact on attitudes, intentions and behavior. For instance, Manstead and Parker (1995) conclude that 10–15% of traffic behavior could be explained by this personal norm. Elliot (2001) concluded that, besides perceived behavior control, personal and

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