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Bi-dimensional attitudes, attitude accessibility and speeding behaviour

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ABSTRACT

Positive and negative attitude dimensions (i.e., bi-dimensional attitudes) asymmetrically predict behaviour, with the positive dimension being the better predictor than the negative dimension. These findings have been demonstrated using self-reported behaviour measures. In this study, we aimed to test the bi-dimensional attitude-behaviour relationship using objectively measured speeding behaviour derived from a driving simulator and test if the asymmetrical prediction of behaviour from the positive and negative attitude dimensions could be explained by attitude accessibility (how available an attitude is in memory and therefore how readily it is able to guide behaviour). One hundred and six drivers completed online measures of the positive and negative dimensions of their attitudes towards exceeding the speed limit. Response latency measures of the accessibilities of both dimensions were also taken. A driving simulator was used to measure speeding behaviour. Both attitude dimensions independently predicted speeding, with the positive dimension being the stronger predictor. The positive attitude dimension was also more accessible than was the negative dimension. The difference in the accessibilities of the positive and negative attitude dimensions significantly mediated the difference in their predictive validities. The results demonstrate that the positive attitude dimension is the principle predictor of speeding and a reason for this is that it is more accessible in memory than is the negative attitude dimension. Road safety interventions (e.g., education) that aim to reduce speeding and associated traffic crashes might usefully decrease the valence or accessibility of the positive attitude dimension. There would also appear to be scope to reduce speeding by increasing the valence or accessibility of the negative attitude dimension.

1. Introduction

Road traffic crashes represent a serious problem. Globally, they account for over 1.25 million deaths per year and many more serious injuries (World Health Organisation, 2017). In the UK, they account for around 200,000 casualties per year (Department for Transport, 2015). It is widely acknowledged that exceeding the speed limit ('speeding') substantially increases the risk of road traffic crashes (RoSPA, 2017). Identifying the predictors of speeding is therefore important because it provides information about the potentially most suitable levers for reducing this aberrant behaviour through the use of educational interventions such as road safety publicity campaigns, including TV, radio and poster advertisements (e.g., Stead, Tagg, MacKintosh, & Eadie, 2004) and speed awareness courses (e.g., Stephenson, Wicks, Elliott, & Thomson, 2010).

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In an attempt to identify predictors of speeding, many studies have focused on the relationship between attitudes (positive/negative evaluations) and behaviour (e.g., Conner et al., 2007; Elliott, Thomson, Robertson, Stephenson & Wicks, 2013; Elliott et al., 2016; Lheureux, Auzoult, Charlois, Hardy-Massard, & Minary, 2015). In these and studies of other driving behaviours (e.g., Elliott, 2012) it has been found that attitudes are statistically reliable predictors of behaviour. However, while the implication is that modifying drivers' attitudes is likely to reduce speeding, experimental studies typically show that interventions designed to alter drivers' attitudes engender very little change in behaviour (e.g., Chorlton & Conner, 2012; Elliott & Armitage, 2009).

There are several reasons why attitude-change interventions have been found to be generally ineffective at reducing driver's speeding behaviour (see Carey, McDermott & Sarma, 2013; Sniehotta, 2009). One potential reason is that they do not focus on the most relevant levers for behaviour-change. For example, research shows that while attitudes are statistically reliable predictors of speeding behaviour, the effects sizes are typically modest, meaning that any sized change in attitudes would be expected to return smaller-sized changes in behaviour (equivalent sized changes in behaviour would only be expected if the attitude-behaviour relationship was perfect; see Armitage & Conner, 2001). In fact, research on driver behaviour has shown that only extremely large-sized changes in attitudes (in excess of d = 0.80), which are typically not achieved in practice (e.g., Hardeman et al., 2010), are capable of generating changes in behaviour (see Elliott, 2012). Many researchers have therefore tested increasingly complex models that incorporate numerous behavioural predictors in an attempt to identify predictors of speeding that might, in addition to attitudes, constitute useful levers for interventions (e.g., Conner et al., 2007; Coogan, Campbell, Adler & Forward, 2014). While these models account for additional variation in speeding, over and above attitudes, they potentially undermine the importance of attitudes because they do not take into account recent developments in this construct. Of relevance to the present study is the concept of bi-dimensional attitudes.

The bi-dimensional conceptualisation of attitudes (e.g., Conner et al., 2002) views the attitude construct as comprising two separate uni-polar, positive and negative dimensions allowing people to independently evaluate the positivity (e.g., 'speeding is not at all positive/extremely positive') and negativity (e.g., 'speeding is not at all negative/extremely negative') of a behaviour at the same time (Thompson, Zanna, & Griffin, 1995). This is in contrast to more traditional conceptualisations of attitudes (e.g., Thurstone, 1928; Osgood, Suci, & Tannenbaum, 1957), which view the construct as bi-polar and unidimensional, allowing people to evaluate a behaviour as being either positive or negative only (e.g., 'speeding is positive/negative'). Typically, unidimensional attitudes are measured directly using semantic differential scales (e.g., Osgood et al., 1957), which reflect participants ratings of the positivity or negativity of the behaviour in question (e.g., 'speeding is extremely good/extremely bad') or indirectly using belief-based composite scales (e.g., Fishbein, 1963), which reflect the summation of participants ratings of the perceived likelihood of salient behavioural outcomes (e.g., 'speeding is very likely/very unlikely to get me to my destination quickly') weighted by their ratings of the positivity or negativity of those behavioural outcomes (e.g., 'getting to my destination quickly is extremely good/extremely bad'). Either way, these measures of attitudes are unidimensional and this unidimensionality has previously attracted criticism.

In particular, the midpoint of a unidimensional, bi-polar attitude scale (e.g., half way between 'extremely positive' and 'extremely negative') is regarded as ambiguous (Kaplan, 1972). It could indicate attitudinal indifference (a state that occurs when a behaviour is simultaneously evaluated as neither positive nor negative) or attitudinal ambivalence (a state that occurs when a behaviour is simultaneously evaluated as both positive and negative). As a solution to this problem, Kaplan (1972) recommended splitting the unidimensional, bipolar attitude scale at its mid-point, thus producing two separate dimensions of attitude: a unipolar positive attitude dimension and a unipolar negative dimension (i.e., bi-dimensional attitudes). Operationally, Kaplan (1972) recommended the split semantic differential technique as a method for measuring the two attitude dimensions. The split semantic differential technique involves asking participants to think separately about the positive and negative outcomes of a behaviour and to separately rate the positivity of the positive outcomes and the negativity of the negative outcomes using unipolar scales. Effectively, this removes the ambiguous mid-point of a unidimensional, bipolar attitude scale and acknowledges the possibility that an individual can hold both positive and negative attitudes towards the same behaviour (e.g., speeding) at the same time (Thompson et al., 1995).

Support for bi-dimensional attitudes comes from factor analytic studies, which have demonstrated that positive and negative evaluations load onto two independent dimensions (e.g., Conner et al., 2002). However, researchers have typically continued to treat attitudes as unidimensional predictors of behaviour (e.g., McEachan, Conner, Taylor & Lawton, 2011). This violates the (positive versus negative) bi-dimensional conceptualisation of attitudes. It also does not allow researchers to identify how well each attitude dimension can predict behaviour and thus gain greater insight into why drivers' might exceed the speed limit (i.e., is it primarily because they positively evaluate the perceived desirable outcomes of speeding or because they do not negatively evaluate the undesirable outcomes?). Furthermore, from an intervention perspective, this issue is potentially important for identifying the most effective levers for reducing speeding. Most notably, the majority of road safety interventions target the negative dimension of attitude with messages that are designed to persuade drivers that the negative outcomes of speeding (e.g., traffic crashes) are undesirable and likely (e.g., Carey et al., 2013; Fylan & Stradling, 2014; Plant, Irwin & Chekaluk, 2017). Given the above cited experimental studies showing that these interventions are typically ineffective at changing driver behaviour, a pressing question is: should practitioners continue with this approach? Alternatively, should they design educational messages that focus more exclusively on the positive dimension of attitude by persuading drivers that the perceived positive outcomes of speeding (e.g., getting to one's destination quickly) are not necessarily as desirable or likely as they might think? Or should both approaches be used in an attempt to discourage speeding? (For a recent discussion of these issues see Lewis, Watson & White, 2016). In order to help answer these questions,