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A perceptual map for understanding concern about unsafe driving behaviours

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ABSTRACT

The objective of this paper is to develop a model that can help explain the public's level of concern associated with six dangerous driving behaviours (drinking and driving, speeding, distracted driving, using a cell phone while driving, fatigued or drowsy driving, and using illegal drugs while driving). Understanding the genesis of concern can be useful in addressing it and leveraging it to improve safe driving. Building on a risk perception model that was developed previously, the study investigated the relationship between the level of concern about the unsafe driving behaviours and the perceived level of concern of others about the dangerous driving behaviours, the perception of the prevalence of the dangerous driving behaviours, the perception of the level of risk imposed by these dangerous driving behaviours, and the perception of the severity of injuries that can result from them. Data from two independent samples were modeled using multidimensional scaling and logistic regression analysis. Both samples come from telephone surveys; one was administered to a random sample of 750 drivers in the province of Ontario, Canada in November 2006, the other to a random sample of 1201 drivers across Canada in September 2006. Two dimensions in particular were found to fit the data well: perceived risk and the perceived level of concern of others. The results from these analyses are summarized using a perceptual map. The relevance of such a map is illustrated by explaining the factors that impact levels of concern regarding several of the unsafe driving behaviours.

1. Introduction

Much has been written in the literature about risk perception and concern for safety hazards (see Renn, 1998; Boholm, 1998, for an overview). Concern should be distinguished from fear; fear is a term used for reactions to immediate threats, while concern (or anxiety) is used for reactions to future or past events (Jackson, 2006; Warr, 2000). Concern or fear must not be equated with risk perception as it has been demonstrated that measures of the former do not measure the same phenomenon as the latter (Rountree and Land, 1996; Ferraro, 1996). "In short, fear[/concern] is not perceived risk; by all indications, it is its consequence." (Warr, 2000, p. 454) It may also be instructive to distinguish between personal concern/fear for oneself and altruistic concern/fear for others since both may be prevalent and have distinct consequences (Warr, 2000).

Several theoretical models of risk perception have been developed including the psychometric model (Fischhoff et al., 1978), the Basic Risk Perception Model (Sjöberg and Drottz-Sjöberg, 1994), the social amplification of risk (Kasperson et al., 1988; Burns et al., 1993) and the Worry about Crime Model (Jackson, 2006). Wåhlberg (2001) investigated these models (except the Worry about Crime Model) and concludes that – despite a large body of literature – not much theory is available in the field of risk perception research.

Nevertheless, several dimensions have been identified in these models as having an influence on levels of concern; they include perceived likelihood of occurring and seriousness of the consequences of the offence or risky behaviour (Jackson, 2004; Nilsson, discussed in Elvik and Vaa, 2004; Vanlaar and Yannis, 2006; Warr and Stafford, 1983; Wolfgang et al., 1985); perceived prevalence of the offence or risky behaviour (Jackson, 2004; Nilsson, discussed in Elvik and Vaa, 2004; Vanlaar and Yannis, 2006); locus of control—being in control of the situation mitigates feelings of concern while lack of control exacerbates such feelings (Jackson, 2006; Wåhlberg, 2001); and social amplification—referring to people and organizations that can amplify fear or concern through various ways of communication (Kasperson et al., 1988; Burns et al., 1993).

Of particular concern regarding the social amplification of concern is the bandwagon effect (McAllister and Studlar, 1991). It refers to the theory positing the reinforcement of a person's beliefs through communal dynamics and means that one's own beliefs will be strengthened if one is convinced that others share that belief.

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Traditionally, criminological research into concern/fear for crime has investigated these issues primarily as a reaction to irrationally high levels of concern/fear for offences that exist among the public, and which can have negative consequences on a society as a whole, such as avoidance behaviour, which may lead to social isolation of neighborhoods (e.g., Conklin, 1975; Skogan, 1990). However, low levels of public concern may be irrational as well and can be equally undesirable for a society if it leads to dangerous behaviour and to lack of public involvement and action. Conversely, public concern can have positive effects because it "can motivate an individual to take personal action by changing their behaviour or incite them to demand that action is taken by government or other responsible agencies." (Vanlaar et al., 2007, p. 15) Concern can therefore serve as a lever that can be used to influence people's behaviour.

This paper addresses the issue of what influences people's level of concern. The objective is to develop a model that can help identify the factors that influence drivers' level of concern about a variety of dangerous driving behaviours—in this case, concern about drinking and driving, speeding excessively, distracted driving, using a cell phone while driving, fatigued or drowsy driving and using illegal drugs while driving. Another objective is to obtain information that provides insight into how similar or dissimilar people think these dangerous driving behaviours are with regard to risk perception and its various dimensions as identified in previous paragraphs.

A risk perception model previously developed by Vanlaar and Yannis (2006) found that the perception of the level of risk imposed by dangerous driving behaviours and the perception of the prevalence of dangerous driving behaviours influenced levels of concern that drivers had about safety issues. This risk perception model was built using multidimensional scaling (MDS) and proved particularly useful in gauging whether or not people discern differences in risks between dangerous driving behaviours that may seem very similar but that are really different, at least to some extent.

MDS is suitable to investigate such perceived similarities and dissimilarities because its prime objective is to build a perceptual map in which distances between items in this map truly correspond to differences in perceptions. For example, in Vanlaar and Yannis' perceptional map (2006) driving while impaired by alcohol was located very closely to driving while impaired by illegal drugs, which means that the public thinks both are very similar with regard to their prevalence and risk for an accident. However, it can be concluded from the literature that this is not necessarily the case. Such belief systems that exist among the public may impede dealing efficiently with both issues, for example if there would be pressure from the public to invest too many resources than can be justified based on the evidence into one issue (e.g., driving while impaired from illegal drugs) to the detriment of the other (e.g., driving while impaired from alcohol).

Building on this previously developed model, two more dimensions were investigated in this paper: the level of concern of others about those dangerous driving behaviours (i.e., the bandwagon effect) and the perception of the severity of injuries that can result from the dangerous driving behaviours. More precisely, the study was designed to test the following hypotheses:

(1) Level of concern of others: if a person believes others are concerned about dangerous driving behaviours, this will heighten an individual's level of concern about those behaviours.
(2) Prevalence or magnitude: if a person believes that a dangerous driving behaviour is prevalent, his/her level of concern about it will increase.
(3) Level of risk: if a person believes that the dangerous driving will increase his/her chances of a crash, he/she will be more concerned about those behaviours.
(4) Severity of injuries: if a person is convinced that the dangerous driving behaviour typically leads to crashes with more severe injuries then his/her level of concern about it will increase.

Ultimately, understanding the dynamics between these dimensions and their role in the genesis of public concern about unsafe driving behaviours can be useful for ensuring that concern is consistent with the level of danger and risk posed by them. Appropriate levels of concern might motivate the public to behave appropriately and/or incite them to demand action to deal with them consistently.

2. Method

2.1. Sampling procedure and participants

Data from two independent random samples were used. Both samples come from telephone surveys; one was administered to a random sample of 750 drivers in the province of Ontario, Canada in November 2006, the other to a random sample of 1201 Canadian drivers in September 2006. Both surveys required an average of approximately 15 min to complete.

Criteria for inclusion in the Ontario survey were: having a valid driver's license, residing in Ontario, and having driven in the past 30 days. Among the 3131 households contacted in Ontario in which a person was asked to participate, 2052 (65.5%) refused, 270 (8.6%) were not qualified, and 59 (1.9%) terminated the interview before it was completed. The Ontario sample was weighted according to gender and age to avoid bias and ensure it was representative of the Ontario population. The final group of respondents for the study included 750 Ontario drivers. Their age ranged from 16 to 93 (mean of 48; median of 47). Forty four percent of all participants were male.

Criteria for inclusion in the Canadian survey were: having a valid driver's license, residing in Canada, and having driven in the past 30 days. Among the 6076 households contacted in which a person was asked to participate, 4418 (73%) refused and 457 (7.5%) were not qualified. The Canadian sample was stratified by province and also weighted according to gender and age to avoid bias. The final group of respondents for the study included 1201 Canadian drivers. The median age category was 45–49. Forty-three percent of the participants were male.

2.2. Questionnaire

To determine the level of concern associated with the dangerous driving behaviours, survey respondents were asked to rate each of them using a six-point Likert-type scale, where one means they think the behaviour is "not a problem at all" and six means they think it is "an extremely serious problem". The behaviours probed in the Canadian sample included drinking and driving, speeding excessively, distracted driving, using a cell phone while driving (both hand-held and hands-free) and fatigued or drowsy driving. The Ontario survey also included the issue of using illegal drugs while driving.

To determine perceptions about these behaviours, respondents in the Ontario sample were also asked to answer the following questions about each of the listed behaviours (including drivers using illegal drugs). First, they were asked how concerned they thought others were about each of the behaviours, using the same six-point scale as before (i.e., dimension 1: level of concern of others). Second, respondents were asked to indicate what percent of drivers they believe engage in each of the behaviours (i.e., dimension 2: prevalence or magnitude). Third, they had to indicate, on a scale from one to six, how likely they think it is for drivers engaging in each of the behaviours to cause a crash where one means "very unlikely"