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Causal attribution in explanations of near-crash events behind the wheel, and its relationship to comparative judgments

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ABSTRACT

Introduction: The development of skills essential for avoiding crashes depends, in part, on how drivers explain the causes of dangerous driving behaviors that resulted in a near crash. This study analyzes causes attributed to such behaviors by car drivers in a self-report study. We explore the relationships between the dimensions of causal attribution, attribution of responsibility for the near crash, and drivers' comparative judgments. *Method:* For approximately two months, 154 drivers (age 23 to 77 years, including 72 females) used logbooks to document the near crashes that occurred during their trips. The causes attributed in those reports to driving behaviors resulting in near crashes were then coded by two judges on the basis of several causal dimensions. Drivers also estimated their own and an average driver's skill levels, and their risk of being involved, as a driver, in a crash. *Results:* We distinguished four main types of causes of the 167 near crashes reported. Drivers had a tendency to more often attribute external causes to their own behaviors resulting in near crashes than to those of others. The probability of attributing a controllable cause increased with overestimation of one's own skills and decreased with underestimation of one's own risk in comparison to other drivers. The probability of attributing a stable cause increased with underestimation of one's own risk. *Conclusions:* When they explained their own behaviors resulting in near crashes, drivers mentioned different types of causes than when they explained those of others. Overestimation of one's own skills as compared to other drivers could be beneficial for developing crash-avoiding skills, insofar as it seems to foster attribution of controllable causes. By contrast, underestimation of one's own risk could have the opposite effect. *Practical applications:* Vulnerability to road risks should be stressed in driver's training and risk communication campaigns. However, self-confidence with respect to one's skills should not always be targeted as a safety problem.

1. Introduction

Driving a car consists of maintaining the speed needed to reach a destination within a desired time period, while keeping at a safe distance from stationary or moving entities in the road environment, in accordance with current road conditions (Summala, 1997). The driver regulates his/her activity according to the perceived level of task difficulty (Fuller, McHugh, & Pender, 2008), which depends, in particular, on driving experience (Delhomme, 1995). Near crashes, that is, interactions where safety margins are narrowed so that feelings of danger emerge, are crucial moments for the development of the skills essential to avoiding crashes (Fuller, 1984; Näätänen & Summala, 1976). It is therefore important to analyze the ways car drivers explain behaviors that lead to near crashes, in order to gain further knowledge about the factors that can facilitate or hamper the development of these skills. In the following paragraphs, we first expose a theoretical background useful for analyzing how individuals attribute causes to behaviors. Then we describe a socio-psychological phenomenon that arises when the probability of negative outcomes is estimated, and that, in line with our research aims, may have an impact on the causal-attribution process.

Causal attribution is an essential mental process for adapting to the physical and social environment (Heider, 1958; Malle, 2004). Research in social psychology has distinguished several dimensions that help systematically describe the causes attributed to behaviors, including locus of causality, controllability, and stability (Weiner, 1979). For the needs of applied research, further work has extended this categorization by adding two dimensions of specificity related to the individuals involved and the outcome (Stratton et al., 1986). *Leeds Attributional Coding System* (LACS, Stratton, Munton, Hanks, Hard, & Davidson, 1988) is a clinical tool designed for categorizing spontaneous causal attributions. According to LACS, most causes can be identified as:

- *internal*, originating in an actor's personality or behavior, or *external*, originating in situational elements or other people;

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- *controllable* or *uncontrollable*, to the extent that any individual involved in the situation can or cannot have an influence on the outcome without effort;
- *stable*, whose influence is maintained beyond one particular outcome, or *unstable;*
- *global*, which can bring about a variety of potential outcomes, or *specific*, restricted only to certain types of outcomes;
- *personal*, distinct to an individual, or *universal.*

Since individual cognitive resources and time available for processing information are limited, causal attribution is not a systematic examination, but is based on efficient mental schemes (Kelley, 1987) that are likely to produce biases. Thus, attributions (as described by the aforementioned dimensions) can vary according to the perpetrator's level of involvement and the valence of the outcome. Several attributional biases, such as the actor-observer effect (AOE, Jones & Nisbett, 1971; for a review, see Malle, 2006; Watson, 1982) and the self-serving bias (SSB, for a review, see Arkin, Cooper, & Kolditz, 1980; Mezulis, Abramson, Hyde, & Hankin, 2004), are firmly established and well documented in the psychological literature.

AOE consists on a systematic discrepancy, between the actor and an observer, in the attribution of a cause to a behavior. In this effect, the actor has a tendency to explain his/her own behavior by external causes, while the observer attributes causes internal to the actor. Three types of explanations for AOE have been proposed. First, the actor and the observer do not have the same type and/or amount of information about the actor (Nisbett, Caputo, Legant, & Marecek, 1973). Second, since the actor is naturally focusing on his/her environment and the observer is focusing on the actor, attention or visual perspective could also explain this effect (Storms, 1973). Third, as Nisbett et al. (1973) suggested, actors are thought to be motivated to refer to external causes so as not to lose their sense of freedom.

SSB is a phenomenon linked to the motivation to preserve a positive self-image (Bradley, 1978; Zuckerman, 1979). SSB is similar to AOE, but only for negative outcomes. When the outcome is negative, actors would indeed attribute external causes to explain their own behavior in order to downplay their responsibility for the outcome. However, when the outcome is positive, actors would explain it using internal causes so as to emphasize their personal qualities. Observers would either not show the same response pattern or show the reverse pattern (Wells, Petty, Harkins, Kagehiro, & Harvey, 1977).

In the realm of traffic psychology, attribution biases have been studied in research on driving behavior. A study by Bordel et al. (2007) is of particular interest because it analyzes reports of real, severe crashes, obtained by the French police from witnesses and drivers considered at fault. Moreover, since external attributions by at-fault drivers were found to be particularly frequent for very severe crashes, the authors interpreted the observed actor-observer asymmetries in attribution in terms of SSB or defensive attribution (Walster, 1966; for a review, see Burger, 1981; for an example of application in the field of traffic psychology, see Baldwin & Kleinke, 1994). Several other studies have found AOE in attributions of causes to risky driving. The driver behaviors targeted in those experiments were either defined generally (as “your” or “your friend's” risky driving; Harré, Brandt, & Houkamau, 2004) or presented to the participants by means of scenarios (videotaped or written) that showed the actor's perspective (i.e., the driver at fault) and/or the observer's perspective (i.e., a bystander or another driver; Baxter, Macrae, Manstead, & Stradling, 1990; Hennessy & Jakubowski, 2007; Herzog, 1994; Lennon, Watson, Arlidge, & Fraine, 2011).

Differences between the perception of oneself and of others are also apparent in risk assessments. In general, people tend to be overly optimistic, in such a way that they underestimate their own risk of undergoing a negative event in comparison to the risk of others (Weinstein, 1980). Claimed to play a positive role in facing health problems (Taylor & Brown, 1988), the impact of this optimism can also be seen as equivocal for behavioral adaptation to risks in a health-related context (Schwarzer, 1994). However, it seems that there are a number of relationships between such comparative optimism and self-efficacy with respect to self-protection (Desrichard, Verlhiac, & Milhabet, 2001). In the field of research on driver behavior and the risks inherent in driving, comparative judgments have also been studied extensively in terms of assessments of one's driving skills as a means of controlling risks (Delhomme, 1991, 1995; Sundström, 2008). Regardless of whether the comparative optimism is displayed with respect to the skill level or the perceived risk of being involved in a crash, research results fail to unambiguously show a link between the magnitude of the bias and actual risk-taking behavior (Delhomme, 2000). Moreover, it remains unclear to what extent the basis of drivers' comparative judgments are experiential or illusory (Causse, Delhomme, & Kouabenan, 2005a; Causse, Kouabenan, & Delhomme, 2007; Delhomme, Verlhiac, & Martha, 2009). However, studies in which drivers are explicitly asked to give explanations for their risk assessments in several specific driving situations have shown that attributions of causes to one's own risks differ from the attributions of causes to others' risks (Causse et al., 2005a; Causse, Delhomme, & Kouabenan, 2005b). More specifically, drivers tend to explain their own level of risk in terms of abiding by traffic laws while explaining others' level of risk in terms of violations and lack of control (Causse et al., 2005b). In the present study, we further explore the influence of comparative judgments on causal attributions in specific risky driving situations.

This study has three aims. First, to apply the LACS in order to categorize causes attributed to behaviors resulting in a near crash. Second, to analyze comparative judgments of driving skills and of being involved as a driver in a crash, in order to estimate the extent to which drivers display comparative optimism. Third, to explore the relationships between the dimensions of causal attribution, attribution of responsibility for the near crash, and comparative judgments. We employ a methodology that we find more ecologically valid than hypothetical scenarios, namely, the analysis of self-reports about near crashes that occurred during everyday driving.

2. Materials and methods

2.1. Participants

The participants were 154 car drivers (72 females) averaging 39 years of age ($\sigma = 13.58$, $min = 23$, $max = 77$). They had had their driver's license for 18.9 years on average ($\sigma = 13.12$) and had driven a car for an annual average of 16,366 ($\sigma = 8806.69$) kilometers. In the sample, 59 participants had been involved in at least a minor collision during the three years preceding the study, and 83 had already lost points for various driving violations. They were all holders of a vehicle insurance policy from the insurance company that financed the study and received a financial compensation of 50€ for their participation.

2.2. Measures

There were three sources of information: a pre-experimental questionnaire (“Driving Habits Sheet”), a logbook (“Near-Crash Sheet”), and a post-experimental questionnaire (“Final Sheet”). The pre-experimental questionnaire contained questions about demographic characteristics (age, gender, kilometers driven, etc.) and about the participants' driving habits (motives for car use and habitual trips by car). The logbook served to describe a near crash by means of open- and closed-ended questions. In the logbook, the participant also identified the road users involved in the event, attributed responsibility for its occurrence (to the self vs. another road user), and specified the behavior deemed to have caused it.

The post-experimental questionnaire contained additional questions about driver characteristics (habitual speeds, prior involvement in crashes, driver's license points lost, etc.), as well as questions

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