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Short communication

Effect of a road safety training program on drivers' comparative optimism

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ABSTRACT

Reducing comparative optimism regarding risk perceptions in traffic accidents has been proven to be particularly difficult (Delhomme, 2000). This is unfortunate because comparative optimism is assumed to impede preventive action. The present study tested whether a road safety training course could reduce drivers' comparative optimism in high control situations. Results show that the training course efficiently reduced comparative optimism in high control, but not in low control situations. Mechanisms underlying this finding and implications for the design of road safety training courses are discussed.

Numerous studies have shown that individuals often display comparative optimism (CO) regarding their driving behavior (Delhomme, 1991; Delhomme et al., 2009; Harré et al., 2005; Job, 1990; McCormick et al., 1986; McKenna, 1993; Svenson et al., 1985; Walton and McKeown, 2001). CO refers to individuals' tendency to perceive their own probability of encountering positive events as higher and that of encountering negative events as lower than that of others (Tyler and Rosier, 2009). In the driving behavior literature, CO is generally assessed by asking drivers to estimate their risk of having a car accident as compared to an average driver (Guppy, 1993; McKenna, 1993; Svenson et al., 1985).

Although CO among regular drivers has clearly been demonstrated, only a few studies have examined the efficiency of safety interventions on drivers' CO (see Kreuter and Strecher, 1995; McKenna and Myers, 1997, for two exceptions). This is unfortunate because CO is assumed to favor risk behavior (Deery, 1999; Harré et al., 2005) and to constitute a barrier to preventive action (Weinstein, 1989). However, how much of a risk factor CO is remains controversial (see Harré and Sibley, 2007; van der Pligt, 1996, for discussions). In the present study, we will examine whether a road safety program can reduce drivers' CO in high control situations, that is, when the situation is assumed to be under control of one's driving skills.

While most drivers estimate their chances of having a car accident as lower than that of others (DeJoy, 1989; Finn and Bragg, 1986; Guppy, 1993; Harré et al., 2005; Holland, 1993; Matthews and Moran, 1986; Quadrel et al., 1993), several factors influence level of CO. For instance, comparison target, age, type of questionnaire used to assess CO (i.e., one versus two questions for each driving situation), have all been shown to moderate level of CO (see Delhomme, 2000, for a review). Other self-enhancement biases, such as above average perceived driving ability (Harré et al., 2005; Harré and Sibley, 2007; McKenna et al., 1991; Svenson et al., 1985) and driving caution (Harré et al., 2005; Harré and Sibley, 2007) have also been reported. These self-enhancement biases are generally related to CO regarding the probability of having a car accident (DeJoy, 1989; Harré et al., 2005, study 1; Harré and Sibley, 2007; Svenson et al., 1985), although not systematically (Harré et al., 2005, study 2). Moreover, traffic safety advertisements have been shown to reduce self-enhancement biases in driving ability (Sibley and Harré, 2009).

Given the relationship between these biases and CO regarding the probability of having a car accident, it may be that the benefits of safety interventions can be extended to CO. Notably, the few studies aiming at reducing this type of CO have met with little success (Kreuter and Strecher, 1995; McKenna and Myers, 1997). This might be due to the difficulty of obtaining such an effect in car accident scenarios. For instance, McKenna and Myers (1997) demonstrated that increasing drivers' accountability (i.e., having to justify their judgments to others, p. 40) reduced self-enhancement biases in driving ability, but did not decrease CO. A possible explanation for this finding lies in individuals' tendency to attribute car accidents in general to external factors (e.g., the weather, an unexpected puncture, other drivers). When the traffic accident scenario is described in general terms (i.e., no particular features or conditions of the

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accident scenario are provided), external reasons are spontaneously provided rather than reasons related to faulty driving skills.

In support of this explanation, McKenna (1993) has shown that CO regarding the probability of having a car accident differs depending on control. That is, the more the accident situation is perceived as directly under control of one's driving skills and thus as highly controllable, the higher the level of CO. In the McKenna research (1993, study 2), 12 scenarios depicting traffic accident situations were introduced, half of which was considered to be high control scenarios, while the other half was assumed to represent low control scenarios. For each scenario, participants estimated their probability of having an accident as compared to an average driver. Results indicated that CO was higher in the high control scenarios (e.g., scenarios in which the accident was caused by changing traffic lanes or overtaking) than in the low control scenarios (e.g., accident caused by an unexpected puncture or oil on the road). It should be mentioned though that in McKenna's (1993) study, control was inferred from the scenario and not directly measured. In another study, Guppy (1993) showed that CO was higher when the situation depicted the probability of having a car accident (i.e., high control situation) than the probability of being stopped by the police (i.e., low control situation). Also, when participants had to imagine that they were the vehicle's passenger – and not its driver – CO was reduced (Kos and Clarke, 2001; McKenna, 1993, study 1, Svenson et al., 1985).

What these studies suggest is that when external factors (e.g., an unexpected puncture) cause the accident, individuals seem to realize that no one can handle the situation. In such low control situations, it does not matter whether individuals perceive their driving ability as better than average. It is only when the accident is caused by factors perceived to be related to one's driving skills (e.g., overtaking) that individuals tend to overestimate their driving ability, and hence to display CO regarding the probability of having an accident.

In sum, there is some evidence that control – at least when inferred from the situation – plays an important role in the CO phenomenon. As mentioned previously, one explanation lies in individuals' tendency to perceive their own driving skills as better than average (Harré et al., 2005; Horswill et al., 2004; McKenna et al., 1991; Job, 1990; Walton and Bathurst, 1998). Because of their confidence in their driving skills, drivers believe that the accident can be avoided in high control situations, and therefore CO does not change. However, if drivers are convinced that even in such situations they do not have the ability to control the situation because many other factors are at stake in car accidents, CO regarding the probability of having an accident may be reduced.

In accordance with such an explanation, we hypothesize that drivers' CO can be modified in high control situations. However, this will only be the case if drivers are aware of their limited ability to handle risky situations. Hence, road safety training courses that increase drivers' awareness that no one can handle risky driving situations should decrease CO in formerly high control situations. In France, training courses designed to offer driving offenders the opportunity to get some points of their driving license back may constitute an ecologically valid context to test for CO reduction. Moreover, to the best of our knowledge, no systematic evaluations regarding the efficiency of these training courses have been conducted by governmental institutions. Our study is therefore the first to test their effect on an important psychological phenomenon in the driving behavior literature (i.e., CO regarding the probability of having a car accident).

In France as in several other countries (e.g., Italy, Great Britain), a driving license with points has been established since a couple of years. This license has 12 points (or six points when drivers have held their license for less than 3 years). The penalty for each traffic offense is, at least, a fine and a point loss. For instance, when a driver fails to comply with a red traffic light, four points of the driving license are lost. When the speed limit is slightly exceeded (less than 20 km/h), one point is lost. Points are automatically returned after 1–3 years (depending on the amount of points lost) if no new traffic offenses are committed. However, because point loss is cumulative, offenders encounter the risk of having their driving license suspended before those years have elapsed. An alternative to get four points back in a much faster way is to attend a road safety training course organized by authorized organisms and the government. Participants of these training courses are thus driving offenders who have lost several points of their driving license and who need four points back to avoid having their license suspended.

In 2008, 261 676 drivers in France attended the training courses (Observatoire National Interministériel de Sécurité Routière, 2008). The training course lasts for 2 days, and its aim is to foster safer driving behavior through the study of specific driving situations. Participants are also encouraged to think about how their driving behavior is related to their lifestyle, beliefs, interactions with others and social rules, attitudes toward risky behavior, and their motivation to enact safer behavior. Eventually, a special focus is placed on increasing drivers' awareness of their limited ability to handle risky driving situations. To do so, driving behavior, driving offenses, examples of accidents, physical laws, active and passive safety, individuals' limited attentional resources, the vehicles limitations and their consequences are all thoroughly analyzed and discussed during specific workshops.

In sum, the program highlights the fact that driving and accident situations are risky by nature. There are situations that obey to physical dynamics and laws. As a consequence, individuals attending the program should become increasingly aware of their limited ability to control the situation and to avoid the accident. This, in turn, should increase risk perceptions' accuracy. Therefore, the training course should reduce perceived control in formerly high control situations, an effect that should be apparent through reduced CO.

More precisely, the present study will examine the effect of the training course by comparing levels of CO regarding the probability of having a car accident among three driver groups: one group of offenders before the training course, one group of offenders which has just attended the same training course, and one group of non-offenders. We expected the training course to reduce CO among offenders in high control situations and thus to observe lower levels of CO after the training course than before. In addition, non-offenders are likely to represent a heterogeneous group with regard to risk perceptions. Indeed, some of the non-offenders may be actual non-offenders who never – or rarely – commit traffic offenses. Others instead may often commit traffic offenses, but have not yet been caught. Risk perceptions are likely to be high among the former, but low among the later. Because of this heterogeneity, we expected CO to be lower for offenders after the training course than for non-offenders.

1. Method

1.1. Participants

Sixty drivers (aged 25–44 years) agreed to take part in the study. They represented three driver groups of twenty participants each: (i) a group of "non-offenders" (i.e., drivers who had never lost a single point of their driving license); (ii) a group of "offenders before training course" (i.e., traffic offenders who had enrolled for a training course but had not taken it yet); (iii) a group of "offenders after training course" (i.e., traffic offenders who had just attended the training course). Offenders were met by a male experimenter either just before the training course (for the "offenders before

training course" group) or just upon finishing the 2-day training course (for the "offenders after training course" group). These two offender groups were thus very similar. The only difference was that offenders were randomly asked to complete the questionnaire either before or after the training course.

Non-offenders were recruited from a community sample living in the same area as the offenders. Non-offenders were invited to take part in the study if they belonged to the same age groups as the two offender groups, if they had never lost any point of their driving license (and thus had never attended a training course), and if they had held their driving license for at least 3 years. Therefore, the non-offenders group was comparable to the offender groups in terms of age, location, and driving expertise. However, non-offenders had never been caught for traffic violations. Because participants in the "offenders after training course" group, which was the first to complete the questionnaire, were mainly males (17 males, 3 females), the same male/female ratio was maintained in the two other groups.

1.2. Material and procedure

The questionnaire was administered in paper-and-pencil format. The study was presented as a study on drivers' risk perceptions and anonymity was ensured. The questionnaire contained 12 scenarios assessing CO regarding the perceived probability of having a car accident, adapted from McKenna (1993, study 2). The scenarios corresponded to specific accident scenarios, with accidents being cause by an unexpected puncture, an unexpected brake failure, oil on the road, skidding on black ice, another vehicle hitting the car from behind, another vehicle overtaking, the driver's vehicle overtaking, turning right, going round a sharp bend, driving into the rear of another vehicle, changing traffic lanes, and fast driving (e.g., compared to the average driver, how likely do you feel that you are to be involved in an accident in which the vehicle you are in has an unexpected puncture?). After each scenario, participants estimated their accident likelihood on a 11-point rating scale ranging from −5 (much less likely) to + 5 (much more likely). Thus, negative scores indicated a higher level of CO.

Following McKenna's (1993) classification, scenarios were considered either as low control or as high control scenarios. The six low control scenarios referred to car accidents where the driver's assumed controllability was low (i.e., accident caused by: a puncture, an unexpected brake failure, oil on the road, skidding on black ice, another vehicle hitting the car from behind, another vehicle overtaking). The six high control scenarios referred to car accidents where the driver's assumed controllability was rather high (i.e., accident caused by: overtaking, turning right, going round a sharp bend, driving into the rear of another vehicle, changing traffic lanes, fast driving). Upon completion of the scenarios, participants reported their age, the average amount of kilometers driven per year, and the year their driving license was issued. In each offenders group, four participants have held their license for less than three and were therefore discarded from analyses.

2. Results

We averaged responses for the six low control and the six high control scenarios to yield an index of CO when assumed control was low and another when assumed control was high. One sample student *t*-tests (against 0) showed that both in the low control ($M = -0.37$, SD = 0.90), $t(59) = -3.2$, $p < .01$, and in the high control scenarios ($M = -1.19$, SD = 1.14), $t(59) = -8.04$, $p < .001$, drivers generally displayed CO. However, a paired student *t*-test revealed that level of CO was higher for the high control scenarios than for the low control scenarios, $t(59) = 5.11$, $p < .001$. Also, a Chi square test revealed that percentage of optimistic drivers was higher for the high control than for the low control scenarios, $\chi^2(2) = 6.57$, $p < .04$ (see Table 1).

Table 1
Percentage of optimistic drivers as a function of assumed control of the accident scenarios.

	Optimistic drivers	Less optimistic drivers	Total
Low control scenarios	61.7	38.3	100
High control scenarios	78.3	21.7	100

When assumed control was high, we expected offenders after the training course to display lower levels of CO as compared to offenders before the training course, but also as compared to non-offenders. For this later group, levels of CO should be lower than for offenders before the training course. Because we had clearly defined a priori hypotheses for these three driver groups, we applied a modified version of Abelson and Prentice's (1997) approach to the use of contrasts. This modified method consists of testing the contrast of interest – which must be significant – and an additional one (to produce a full set of two orthogonal contrasts) – which must be non-significant (see, for instance, Brauer and McClelland, 2005).[1] The contrast of interest was that of the linear trend (1, 0, −1), corresponding respectively to the following driver groups: "offenders before training course", "non-offenders", "offenders after training course". With this contrast, we tested whether offenders before the course would be more optimistic than non-offenders, and whether these latter would be more optimistic than offenders after the course. This contrast of interest was opposed to the additional quadratic contrast (−1, 2, −1). Both of these contrasts were tested for the low control and high control scenarios. Descriptive statistics are displayed in Table 2.

Results of the regression analyses showed that for the low-control scenarios there were no differences between driver groups ($\beta = .004$, $t = .03$, ns, and $\beta = -.15$, $t = -1.12$, ns, for the contrast of interest and quadratic contrast, respectively). As expected however, for the high-control scenarios, results revealed that level of CO for offenders after the training course was lower than for offenders before the training course. Analyses also demonstrated, as expected, that CO for offenders after the training course was lower than for non-offenders ($\beta = -.44$, $t = -3.74$, $p < .001$, and $\beta = -.04$, $t = -.32$, ns, for the contrast of interest and quadratic contrast, respectively).

3. Discussion

The aim of the present research was to demonstrate that a road safety training course could reduce drivers' comparative optimism (CO) in high control situations. In these situations, we expected driving offenders after the training course to display lower levels of CO as compared to offenders before the training course and to non-offenders. Results show that drivers' level of CO was generally high when evaluating their chances of having a car accident relatively to an average driver. However, this tendency was stronger in high control than in low control situations. This result is in accordance with McKenna's findings (1993, study 2), and provides new evidence regarding the importance of taking controllability of the situation – albeit inferred – into account.

[1] The residual between-groups variance is tested with a one df test and not, as suggested by Abelson and Prentice (1997), with a multiple degree of freedom test. As formally demonstrated for instance by Brauer and McClelland (2005), the one df test is preferable because it keeps Type I errors at an acceptable level. The reported analyses are based on multiple linear regressions, with the values of the contrast corresponding to the different levels of the independent variable. The reported beta coefficients represent the standardized regression coefficients.

Table 2
Mean levels of comparative optimism (and standard deviations) as a function of driver group and assumed control of the accident scenarios.

	Non-offenders	Offenders before training course	Offenders after training course	Total
Low control scenarios	−0.56 (1.02)	−0.27 (0.71)	−0.28 (0.95)	−0.37 (0.90)
High control scenarios	−1.25 (0.97)	−1.77 (0.91)	−0.54 (1.22)	−1.19 (1.14)

The importance of assumed controllability was particularly apparent when comparing levels of CO for the three driver groups: while no between-group differences were found in the low control situations, meaningful differences were found in the high control ones. More precisely, non-offenders had lower CO scores than offenders before the training course. This suggests that before the training course, in high control situations, offenders' perception of their superior driving skills leads them to judge the likelihood of having a car accident as less than that of others. Such a judgment may also lead them to adopt risky driving behavior and to commit more traffic offenses. An alternative explanation in terms of external attributions (e.g., bad weather, other drivers) does not seem sustainable here because levels of CO between the two groups did not differ when controllability of the situation was low. Moreover, because our high control scenarios were specific driving accident scenarios and not general ones, there was no room for spontaneous external attributions.

Notably, offenders after the training course were those who got the lowest CO scores in the high control situations, both as compared to offenders before the training course and to non-offenders. Although our findings suggest that the training course efficiently reduced CO, we did not measure CO before and after the training among the same participants. It would have been interesting to implement such a within-subjects design, but it would have increased social desirability concerns among participants (see Sibley and Harré, 2009, for a discussion on social desirability effects on the type of measures used in our study). Moreover, because driver groups before and after the training course were virtually the same, the between-subjects design used in the present study also represented an appropriate procedure to examine the effect of the training course.

Together, our results seem to contradict Delhomme's assertion that "when it comes to risk perceptions in traffic accidents, CO seems quite impossible to modify" (2000, p. 106). Our results suggest that the training course led drivers to become increasingly aware of their limited ability to control the situation and to avoid the accident. Because we did not measure these perceptions, this possibility should be interpreted with caution. Also, it is still possible that the training course reduced CO indirectly through a reduction of self-assessed driving abilities. Indeed, workshops dedicated to the study of driving situations, physical laws, and factors reducing driving attention may be particularly efficient in adjusting drivers' risk perceptions. By highlighting the fact that many factors are at stake in car accidents, drivers may have been more able to put the role of their driving abilities into perspective, and were therefore less optimistic regarding their probability of having an accident as compared to other drivers. In sum, the training course may have influenced both drivers' awareness regarding their limited ability to control the situation and the assessment of their driving abilities. Future research should examine these possibilities further, for instance by directly assessing driving ability, driving caution, and control perceptions upon completion of the specific workshops rather than upon completion of the course as a whole.

Our results suggest that training courses meant to offer driving offenders the opportunity to get some points of their driving license back are efficient, at least in reducing comparative optimism regarding the probability of having a car accident. This issue, which has not yet been examined by governmental institutions is very important, especially because the French government is planning to implement a new version of the training course. Our study suggests that the current training courses are relevant and that their content can be used as a basis for future changes.

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