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► **To cite this version:**

Cécile Martha, Jason Laurendeau, Jean Griffet. Comparative optimism and risky road traffic behaviors among high-risk sports practitioners. *Journal of Risk Research*, 2010, 13 (4), pp.429-444. 10.1080/13669870903169275 . hal-03988183

HAL Id: hal-03988183

<https://hal.science/hal-03988183v1>

Submitted on 14 Feb 2023

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TITLE PAGE

**Comparative optimism and risky road traffic behaviors among high risk sports
practitioners**

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Running head: Comparative Optimism and High Risk Sportsmen

Number of words (excluding references, tables and abstract):

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Comparative optimism and risky road traffic behaviors among high risk sports practitioners

Abstract

This study examines the relationship between participation in risky sports, comparative optimism (CO), and risky road traffic behaviors among a sample of adult men. We surveyed high risk ($n=313$) and low risk ($n=53$) sports practitioners, and non-sportsmen ($n=89$), assessing their CO, as well as their self-reported risky behaviors and their accident experiences while driving a car. Results show that high risk sports practitioners expressed CO regarding the quality of their reflexes while driving and their vulnerability to traffic accidents. High risk sportsmen reported more risky behaviors while driving a car than the members of the other groups, and some of them, namely BASE-jumpers, have experienced more traffic accidents. High risk sportsmen's risky behaviors and accident experiences did not prevent them from expressing CO regarding their vulnerability to road accidents. Results are discussed, as well as putative psychological mechanisms underlying high risk sport practitioners' CO and risky behaviors while driving.

Key-words: High risk sportsmen; Perceived comparative risks; Vulnerability; Quality of reflexes; Risky driving; Road accidents.

Comparative optimism and risky road traffic behaviors among high risk sports practitioners

Physical activity is often presented as an important source of psychological and social benefits that affect health (Dunn, Trivedi, and O'Neal, 2001; Sonstroem, 1984). For example, national surveys indicate a negative relationship between physical activity and consumption of harmful substances in France (French Health Education Committee, 1999) and in the USA (Naylor, Gardner, and Zaichkowsky, 2001). Also, a positive relationship has been found between sports participation and safety behaviors when traveling on a two-wheeled vehicle (Martha and Griffet, 2007), and favorable adolescent risk profiles regarding sexual intercourse, delinquency, or cigarette smoking (Nelson and Gordon-Larsen, 2006). However, some studies seem to contradict the above findings, showing instead an association between physical activity and risk-taking behaviors. Athletes have been described as exhibiting more risk-taking behaviors than nonathletes when driving a car (Nattiv, Puffer, and Green, 1997), consuming harmful substances (Lorente et al., 2004), engaging in violent behavior and having unprotected sexual encounters (Nattiv et al., 1997), and early sexual contact (Forman et al., 1995).

The purpose of this study is to shed further light on the relationship between sport participation and risk behaviors in other dimensions of daily life. We propose to consider the potential relationship between engaging in risky sports and both risk perception and risk-taking behaviors in the specific area of traffic safety. We focused on driving because of its similarities with many sporting activities. Both driving and sports involve perceptual and motor skills, and may be considered as social activities (Peretti-Watel, 2001), as they not only occur in the presence of others people, but also depend of the observed behavior of others (Weber, 1971).

As traffic statistics show, driving remains a daily activity which entails some risks for physical health: In 2005, according to the European Road Safety Observatory, there were

5320 traffic fatalities in France, and 37300 in the European Union. A large body of studies have focused on people's perceived comparative risks while driving, showing that drivers tend to perceive themselves to be less vulnerable to traffic accidents than are their peers (Finn and Bragg, 1986; Guérin, 1994; Guppy, 1993; Harré, Susan, and O'Neill, 2005; Rutter, Quine, and Albery, 1998). They tend to think they are more skillful than their peers are while driving (Harré et al., 2005; Horswill, Waylen, and Tofield, 2004) and believe that they have better than average reflexes (Delhomme, 1991). All in all, these studies suggest that drivers have a propensity to express comparative optimism (CO; Shepperd et al., 2002; Weinstein, 1984), a tendency to claim that they are less likely to experience a negative event or more likely to experience a positive one, in comparison to others. Such a tendency is attributed to a psychological effect variously described as the optimistic bias or overconfidence, which would result from an illusion of control (DeJoy, 1989; Delhomme, 1991, 2001; McKenna, 1993).

Perceived comparative risks are assumed to be a motivating factor for behavior change in a number of theoretical models (Weinstein, 1987). From a practical point of view, they may be related to the way people perceive safety recommendations and adopt cautious behaviours (Perloff & Fetzer, 1986). Thus, in order to improve prevention efficacy, it is important to examine factors associated with perceived comparative risks. Our study examined the link between high risk sports participation and both perceived comparative risks and risky behaviors while driving a car.

We hypothesized that high risk sports practitioners, who have to manage some major physical hazards in their sport, would have a tendency to express that the quality of their reflexes while driving a car (QRD) is higher than that of the average (Hypothesis 1a), and that their vulnerability to be involved in a road accident while driving a car (VAD) is lower than that of the average (Hypothesis 1b). High risk sports practitioners would also report more

risky driving behaviors Hypothesis 2) and more accident experiences than controls (i.e., low risk sports practitioners and non-sportsmen) (Hypothesis 3). Among high risk sport practitioners, perceived comparative VAD would be related to accident experiences and risky behaviors while driving (Hypothesis 4).

Method

Participants

This study was approved by the local university ethics committee of the University of the Mediterranean in Marseilles (France). We limited the analysis to men because there were very few women who responded to the surveys. Although risk sport participation does not guarantee injury or death and that there are numerous ways to participate in most sports in relative safety (Donnelly, 2004), risk of serious injury or death is a ubiquitous feature of some sporting experiences, in comparison with sports involving almost no risk for physical health. This is the case of skydiving, BASE-jumping, and paragliding, that we qualified as “high risk sports” in this study. In order to determine the dangerousness of these sporting activities, we have quantified the risk of activity-related injury (or death) based on the number of injuries (or deaths) per 1000 participants per year (Spinks and McClure, 2007). According to the French federations of paragliding and skydiving, each of these sports has claimed about 12 lives per year in France over the past 5 years, that is to say 1 death per 3500 skydivers and per 2580 paragliders. BASE-jumping, a sport in which participants use a parachute to jump from fixed objects (e.g., buildings, bridges, cliffs; see Cooper & Laurendeau, 2007), is also a high risk sport. This sport has resulted in 1 death per year in France amongst the 200 French BASE-jumpers over the past 5 years (Di Giovanni, 2007). In contrast to those high risk sports, other sports such as dancing, fitness, or swimming, can be classified in the category of low risk sports. Of course, one can not claim that there is strictly no risk for physical health while

practicing such sports. For instance, dancing can involve risks of injuries such as ligament or tendon distortion (or even rupture), or fractures (Goulart et al., 2008), above all among professional dancers (Meuffels and Verhaar, 2008). However, the probability of being seriously injured or killed while practicing dancing or fitness remains very low in comparison with such a probability in team or contact sports (Spinks and McClure, 2007) or high risk sports such as rock climbing (Jones, Asghar, and Llewellyn, in press) or BASE-jumping (Cooper and Laurendeau, 2007; Di Giovanni, 2007; Martha and Griffet, 2006).

We surveyed 501 male adults, divided into three subgroups: 1- high risk sports practitioners (paragliders, skydivers, and BASE-jumpers), 2- low risk sportsmen (swimmers, badminton players, fitness enthusiasts and dancers), and 3- non-sportsmen (students and adults representative of the different French socio-professional categories). From this last group, only the participants who reported not practicing sport were included in the analysis.

Procedure

Participants were contacted in several different ways. BASE-jumpers were first contacted by the way of an electronic mail obtained from the website of the French base association (<http://www.base-jump.com>), in order to gain access to their sites and conduct both an ethnographic study (Martha and Griffet, 2006) and the present quantitative survey among the BASE-jumpers. Skydivers and paragliders were contacted by e-mail, as the French federations of paragliding and skydiving provided electronic mail addresses of their participants members. All the low risk sportsmen (swimmers, badminton players, dancers, and fitness enthusiasts, were contacted on their practice site in Marseilles where we could “enter in” easily thanks to ones of our colleagues who worked there as teachers. We told to all participants that we wanted to conduct a study on the theme of daily activities like sport and driving, among adults who had a driver’s license. We asked for their informed consent to fill out a questionnaire. Except for some BASE-jumpers, skydivers and paragliders, who asked us

to send the questionnaire by mail and returned it anonymously in a stamped addressed envelope, the sportsmen filled out the questionnaire on their practice site and returned it into a large box containing others' questionnaires to preserve respondents' anonymity. The same data collection method was used for the non-sportsmen, selected to capture a range of job categories. They completed the questionnaire at work locations (offices, shops, classrooms etc.).

Material

The first section of the questionnaire addressed background details of the respondents including age and sporting activity(ies). Participants were asked to report their frequency of participation, their subjective expertise level, and the number of years of experience with a given sport.

The second section listed four questions related to perceived comparative risks while driving a car. Participants' perceived comparative VAD and QRD were obtained by the direct method for measuring perceived comparative risks, that is the use of a single item which asks the respondents to compare themselves directly to the average. This use of a single item has been validated in surveys investigating perceived comparative risks while driving (e.g., Delhomme, 1991; Rutter et al., 1998). We measured perceived comparative VAD and QRD by asking participants to compare themselves to both a non-specific (Q1) and a specific referent (Q2), by answering the following: (Q1) 'In your opinion, what is your probability of being involved in a road traffic accident while driving a car in comparison with that of the average same-age and same-sex French driver?'; 'In your opinion, how is the quality of your reflexes while driving a car in comparison with that of the average same-age and same-sex French driver?'; and (Q2) 'In your opinion, what is your probability of being involved in a road traffic accident while driving a car in comparison with that of the average same-age and same-sex French sportsperson driver (i.e., a sportsperson (of any sport) that also drives)?'; 'In

your opinion, how is the quality of your reflexes while driving a car in comparison with that of the average same-age and same-sex French sportsperson driver?'

To express their perceived comparative VAD, participants answered on a scale, ranging from -3 ('much less likely') to +3 ('much more likely'). We reverse-coded responses, so that scores higher than '0' correspond with CO, and scores lower than '0' correspond with comparative pessimism. To express their perceived comparative QRD, participants answered on a scale ranging from -3 ('much worse') to +3 ('much better'). Thus, scores lower than '0' correspond with comparative pessimism and scores higher than '0' correspond with CO. Scores close to zero indicate that participants rate their VAD or QRD as being similar to those of the aforementioned referents.

In the third section, self-reported risky behaviors while driving a car were evaluated by the average score on seven items derived from the risk behavior scale used by Ulleberg and Rundmo (2003), after a factor analysis (in the present study, *Cronbach's* alpha = 0.78). These items were: 'How often do you exceed speed limits by more than 25 km/h on a highway; on a secondary road; in town?'; 'How often do you overtake on a blind bend on country roads?'; 'While driving, how often do you use cell-phone while driving without wearing an earphone?'; 'How often do you drive with a blood alcohol level beyond the authorized threshold (0.5g/l)?'; and 'How often do you accelerate when the traffic light turns to orange?'. Answers were given on a scale, from 1 indicating 'never' to 7 indicating 'always', so that a high score on the scale indicates a high degree of self-reported risky driving.

The fourth section consisted of one question about the number of traffic accidents necessitating medical attention that the participants had experienced in the last five years. While this measure likely excludes a number of incidents not requiring medical attention, it also minimizes the problems raised by different subjective interpretations of what constitutes an "accident."

Statistical analyses

Data analyses were carried out using SPSS software, version 10.1 (SPSS Inc., Chicago, IL, USA). A descriptive analysis was first conducted to examine CO, accident experiences and risky behaviors while driving. As we anticipated that there might be differences between the participants composing the high risk sportsmen group – paragliders, skydivers, and BASE-jumpers – analysis was also performed among these three subgroups considered separately. Second, a one-sample t test procedure was employed to test if the participants expressed a significant CO.

We compared the three groups (high risk sportsmen, low risk sportsmen, and non-sportsmen) with regard to perceived comparative QRD, perceived comparative VAD, self-reported risky behaviors, and accident experiences. For this purpose, we conducted a multivariate analysis of variance (MANOVA). Then, univariate analyses (ANOVAs) were carried out to test which dependent variables were responsible for the differences in mean vectors that were shown in MANOVA. All ANOVAs were calculated after logarithmic transformation to correct for unequal sample sizes, and were supplemented by pairwise comparisons with Tukey's correction in order to evaluate differences between each group of participants.

Finally, multivariate analyses were carried out on each group of participants to test the putative roles of perceived comparative QRD, accident experiences and risky behaviors while driving, on perceived comparative VAD.

Results

As we removed 48 uncompleted questionnaires the analysis was based on data from 455 respondents. The mean age was 36.1 years ($SD = 10.7$). The sample was composed of 313 high risk sportsmen (mean age = 35.9; $SD = 10.0$), 53 low risk sportsmen (mean age = 36.8; $SD = 12.1$), and 89 non-sportsmen (mean age = 37.1; $SD = 11.3$). There was no significant

difference between the 3 groups in mean age ($F(2, 455) = 2.67; p = 0.057$). Table 1 provides the distribution of the population, the average age and the average frequency of practice according to the sporting activity.

Insert Table 1

The non-sportsmen and low risk sportsmen did not express a CO when comparing their VAD with that of the non-specific referent (Table 2). Only high risk sport practitioners showed evidence of this CO ($p < 0.001$). The paragliders, skydivers, and BASE-jumpers considered separately expressed also this CO ($p < 0.05$). The same observations were made when the referent was more specific (i.e., the average same age and same sex sportsmen driver). Only high risk sports practitioners expressed this kind of CO ($p < 0.001$), as well as the paragliders, the skydivers, and the BASE-jumpers considered separately ($p < 0.001$).

All the participants demonstrated evidence of CO when comparing their QRD with that of the non-specific referent (Table 2). When the participants compared their QRD to that of the specific referent, only the high risk sportsmen showed evidence of this CO ($p < 0.001$).

Insert Table 2

Statistical differences according to the group in perceived comparative QRD, perceived comparative VAD, self-reported risky-behaviors, and accident experiences, are also provided in Table 2. MANOVA revealed significant group differences on the dependent variables (Wilks' Lambda $F_{(12, 1809)} = 3.38, p < 0.01$). The low risk sportsmen expressed a lower CO regarding one's quality of reflexes while driving with the key comparison of 'average same-aged other French sportsmen drivers' than did the high risk sportsmen ($p < 0.001$), and more particularly than did the skydivers ($p < 0.001$) and the BASE-jumpers ($p < 0.05$). The high risk sportsmen adopted more risky behaviors while driving than did non-sportsmen and low risk sportsmen ($p < 0.01$). When the high risk sportsmen group was divided into three subgroups, average scores of risky behaviors while driving were higher

among skydivers and BASE-jumpers than among non-sportsmen and low risk sportsmen. Differences between each group of sportsmen on accident experiences were significant only when the high risk sportsmen group was divided into three subgroups. Only the BASE-jumpers ($p < 0.01$) have experienced more traffic accidents than others sub-groups.

Multivariate analyses (Table 3) were performed to determine if the perceived comparative VAD (in comparison with that of the specific referent) was influenced by the perceived comparative QRD, self-reported risky behaviors, and accident experiences while driving, among all the participants groups.

Insert Table 3

Results from multivariate analyses showed that accident experiences contributed to reduce CO regarding VAD among the non-sportsmen ($\beta = -0.22, p < 0.01$) and the low risk sportsmen ($\beta = -0.19, p < 0.05$) exclusively. Among high risk sports practitioners, including BASE-jumpers (who demonstrated the highest number of accidents), neither accident experiences nor risky behaviors predicted CO regarding VAD. Perceived comparative QRD was related to perceived comparative VAD among skydivers ($\beta = 0.27, p < 0.01$) and BASE-jumpers ($\beta = 0.64, p < 0.01$), but not among paragliders, low risk sports practitioners, or non-sportsmen.

Discussion

The aim of this study was to identify the role of risky sporting activities as a factor associated with both perceived comparative risks and risky behaviors while driving a car. Our results showed that high risk sports practitioners assessed their vulnerability to be involved in a road accident while driving a car (VAD) as being lower than that of the specific referent (i.e., the average same-age and same-sex French sportsperson driver) and the non-specific one (i.e., the average same-age and same-sex French driver), and assessed their quality of reflexes

while driving a car (QRD) as being higher; this supported Hypothesis 1a and Hypothesis 1b. Such a comparative optimism (CO) was not observed among the controls groups (i.e., the low risk sportsmen and the nonsportsmen). They assessed their VAD as being similar to that of both the specific and the non-specific referent. However, their perceived comparative QRD differed according to the specificity of the referent, since they assessed their QRD as being higher than that of the non-specific referent, and were less optimistic when assessing their QRD in comparison with that of the specific referent. This result supports those found by previous studies (Helweg-Larsen and Shepperd, 2001) who showed that the more distant or ambiguous is the referent, the greater the respondents' tendency to express CO.

In our study, we did not have the opportunity to determine if high risk sports practitioners are right to think they have better reflexes than both the specific and the non-specific referent. Specific experimental studies should be undertaken to identify a putative transfer of the perceptual and motor skills as suggested by the identical elements theory proposed by Thorndike (1903; see Hilgard and Bower, 1975). To our knowledge, such information is not available from the literature. Mori, Ohtani, and Imanaka (2002) have demonstrated the superior anticipatory skills of karate athletes in comparison with novices regarding the specific target area of an opponent's attack, while Abernethy, Baker, and Cote (2005) have shown that some selective transfer of pattern recall skills may be possible from one sport to another, but no longitudinal nor cross-sectional studies have shown a link between sport (risky or not) and development of cognitive skills and reflexes in other dimensions of daily life.

Several interpretations may be proposed to explain high risk sports practitioners' CO regarding their VAD and their QRD. We may suppose the existence of a psychological transfer of risk attitudes from risky sporting to driving (and vice-versa), as both activities share elements such as hazards, temporal and environmental constraints, etc. Driving behavior

can not be viewed as an isolated behavior (Tillman and Hobbs, 1949). It is connected to other aspects of life and is affected by the individual's values and attitudes (Bina, Graziano, and Bonino, 2006), including those that can be developed while practicing risky sports. For instance, having to regularly manage the physical dangers entailed by participation in a risky sport may induce a feeling that one's own perceptual and motor skills are strongly developed. Indeed, all temporal, spatial and environmental sporting constraints require the ability to quickly and accurately perceive relevant information, thus facilitating decision making (Houlston and Louves, 1993). Risk sports such as BASE-jumping, paragliding and skydiving are very good examples of sports with high levels of constraints. For instance, skydivers are used to piloting a canopy at high speed in an environment shared with other users (collision with other pilots is a very feared cause of accident for skydivers and paragliders), while managing challenging (and often changing) wind conditions (Laurendeau and Van Brunschot, 2006, p.182). For these reasons, and despite their realistic judgments regarding their higher probability of being seriously injured while participating in their sport in comparison to the average sportsmen (Martha and Laurendeau, in press; Martha, Sanchez, and Gomà-I-Freixanet, in press), high risk sportsmen believe in their abilities to cope with risk (Moen and Rundmo, 2005; Schneider et al., 2007; Slinger and Rudestam, 1997). Hence, we can speculate that skydivers, paragliders and BASE-jumpers who develop fast reactions while practicing may develop self-confidence, at least in a subjective way, in their ability to quickly and accurately deal with the danger while practicing sport, as well as while driving a car.

Recent research has shown that consistent engagement in patterns of risk-taking behavior might affect the development of risk-related cognitions and beliefs (Brown, 2005), inducing lower feelings of vulnerability. Such a belief modification would be one way to reduce dissonance between high levels of risk-taking behavior and beliefs concerning risk (Gerrard et al., 1996), and would concern several daily life activities. This has been suggested

by Lyng and Snow (1986) and Lyng (1990) who showed that skydivers believed they had special skills for surviving life-threatening experiences, and tried their hand at other kinds of high risk activities as motorcycle riding. According to them, being able to negotiate these edgework experiences was a clear proof of one's rare talent for taking to the limit (Lyng and Snow, 1986). Hence, skydivers claim to possess a "special ability, one that transcends activity-specific skills such as those needed for driving a car or riding a motorcycle" (Lyng, 1990, p.859). Recently, Laurendeau (2006) has suggested that this might be something of an oversimplification. He argues that edgeworkers do not randomly engage in risk activities, but only in those over which they believe they possess a degree of control: "It seems that a survival instinct, transferable across activities, intersects with experiential knowledge and social experience, specific to particular risk activities, to determine which activities edgeworkers believe themselves able to control" (Laurendeau, 2006, pp. 600-01). This does not challenge the fundamental premise here, though, as driving is an everyday activity with which these practitioners are almost certain to be familiar.

A striking finding in our study was that high risk sportsmen reported more risky behaviors while driving than did the non-sportsmen and the low risk sportsmen. This result supported Hypothesis 2. As we cannot determine a causal relation between risky sporting activities and risk-taking while driving a car, we cannot refute the hypothesis of a natural propensity for risk-taking in several domains of daily life (Peretti-Watel, 2001) among risk-sports practitioners. Such a tendency could be the consequence of a personality trait (Breivik, 1996; Vollrath, Knoch, and Cassano, 1999) or the repercussions of high risk sporting experiences which could involve habituation to the danger. Alternatively, there may be something of a response bias here. It may be that respondents engaged in these risk sports are embedded in a culture in which particular kinds of risk-taking are rewarded subculturally as

participants “do” masculinity (Laurendeau, 2008). Further studies are needed to address this issue.

Some of the high risk sports practitioners, namely the BASE-jumpers, have also experienced more traffic accidents than other groups, which supported Hypothesis 3. We have to be cautious with this finding, as the current study does not include measures of how many kilometers participants drive, or the kinds of driving (e.g., pleasure, business) in which they engage. Nevertheless, this result remains quite interesting. We mentioned previously that we could not determine whether or not high risk sportsmen were right to think that their QRD are better than that of the average, or if this CO was based on inaccurate perceptions. Concerning the BASE-jumpers, even if their superiority of reflexes were real, the fact that they adopted more risky behaviors while driving could cancel out the protective effects of such reflexes regarding to the risk of being involved in an accident. As suggested in the risk homeostasis theory (Wilde, 1982), such risky behaviors could make the edge more difficult to negotiate by requiring greater amounts of skill, and could finally induce more crash vulnerability. Independently of the reality of the BASE-jumpers’ QRD, the fact that they adopt more risky-behaviors and have experienced more traffic accidents, raises some doubts about their CO regarding their VAD. Multivariate analyses showed that high risk sportsmen’s standing on risk factors did not prevent them from expressing CO regarding their VAD, as neither accident experiences nor risky behaviors were related to such a CO among the high risk sportsmen group. This result invalidates Hypothesis 4, but goes hand in hand with studies which have shown that the relationship between accident experience and CO while driving was not systematic and remained still debated (Lin et al., 2004; Martha and Delhomme, in press; Rutter et al., 1998). As they practice a high risk sport despite their knowledge of its dangerousness and the numbers of practitioners killed each year, it is possible that these practitioners are somewhat accustomed to avoid calling into question their vulnerability

despite their experience of negative events in several domains of daily life. In a study of skydivers, Laurendeau (2006) suggests that jumpers engage in various discursive strategies in order to defend the idea that they can exert control over the hazards of their sport, even in cases where they have been injured in the sport. It may be, then, that high risk sport practitioners take these techniques with them into other daily activities. This seems to us to be a promising avenue for future investigation.

Conclusions

Our study analyzes attitudes toward risk in the field of road traffic, focusing on differences between participants having very different cultures and experiences of sporting risks, due to the intrinsic characteristics of their sports. Hence, the striking features of our investigation provide support for a propensity among participants who are accustomed to dealing with physical dangers to express CO and to report risky behaviors regarding road traffic.

The findings outlined above should be treated with a degree of caution in light of the limitations of this study. Firstly, the cross-sectional research design limits the extent to which we can make claims about causality based on these data. Secondly, as with all survey research, there is the question of how truthfully respondents answered sensitive questions. For instance, some of the high-risk sportsmen may have exaggerated their their tendency to take risks while driving. In the field of daily life activities which may involve risk taking such as high risk sports or driving, there are probably subcultural norms and questions of self-identity at play around these issues of self-reported risky behaviors (see Hunt, 1995; Laurendeau and Gibbs Van Brunschot, 2006). However, we endeavoured to limit response bias by taking precautions when inviting participants to take part in the study, stressing the anonymity of their responses and our interest in receiving honest and accurate information. Thirdly, we

have not controlled factors which can have an impact on the risk perceptions and behaviors among car drivers, such as the number of kilometers traveled per year, the use made of the vehicle (personal versus professional), and the type of vehicle, which can have an impact on the risk perceptions and behaviors among drivers.

Despite these limitations, the results and the information gained from this study could prove to be useful to evaluate the role of sport participation in the propensity to feel optimistic and engage in risk-taking while engaged in a daily activity such as driving. Further studies across sports (e.g., more or less risky, individual or collective) are needed to explore sport–CO links as well as the transfer of physical and cognitive skills between sporting activities and other undertakings. For example, researchers might employ an experimental protocol of virtual reality (immersion in a road traffic world) in order to address these questions.

Research in this area would provide the most relevant information to identify the role of sport in risk perceptions, CO, and risky driving behaviors. We know that attitudinal biases in drivers' evaluations of their relative skill and safety may hinder the effect of public safety campaigns (Svenson, 1981; Walton and McKeown, 2001). In this vein, a deeper understanding of the way sportsmen develop self-confidence and sense of invulnerability when facing danger is a starting point for planning and adapting prevention programs regarding several domains of daily life risky behaviors such as physical activities and driving.

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Acknowledgements

This publication was partially supported by a grant from the *Fondation Cetelem* (France). The authors thank the reviewers and the section editor for their helpful comments on this manuscript, as well as the participants who took part to this study.

Table 1

Participants' characteristics regarding age and sporting activity ($n = 455$)

Groups	% (n)	Mean age (SD)	Mean frequency of practice (SD)
Subgroups			
Non-sportsmen	15.5 (89)	37.1 (11.3)	--
Low risk sportsmen	9.2 (53)	36.8 (12.1)	
Swimmers	2.6 (15)	35.9 (9.2)	2.5 (0.5) times per week
Dancers	1.4 (8)	36.8 (6.0)	1.2 (0.2) times per week
Badminton players	2.6 (15)	36.0 (10.1)	2.1 (0.5) times per week
Fitness enthusiasts	2.6 (15)	41.4 (10.2)	2.6 (0.3) times per week
High risk sportsmen	54.5 (313)	35.9 (10.1)	
Skydivers	35 (201)	36 (9.7)	82 (14) jumps per year
BASE-jumpers	6.8 (39)	31.6 (5.9)	55 (12) jumps per year
Paragliders	12.7 (73)	37.6 (11.8)	43 (16) flights per year

Table 2

Means, standard deviations, and group differences in perceived comparative QRD, perceived comparative VAD, self-reported risky behaviors, and accident experiences while driving a car

Variables	Groups	n	Mean	SD	<i>t</i> (<i>p</i> value)	<i>F</i> -value (<i>p</i> value) and Tukey- Kramer post-hoc tests (<i>p</i> value)	<i>F</i> -value (<i>p</i> value) and Tukey- Kramer post-hoc tests (<i>p</i> value) on
						on the three groups ^c	the five groups ^d
Perceived comparative QRD in comparison with that of the specific referent ^a	High risk sportsmen	313	0.49	0.9	7.9 ***	F _(2, 451) = 4.14 ** high risk sportsmen > low risk sportsmen **, non-sportsmen **	F _(4, 451) = 5.4 *** skydivers, BASE-jumpers > low risk sportsmen **, non-sportsmen **
	Paragliders	73	0.35	0.8	3.5 ***		
	Skydivers	201	0.51	1.0	6.7 ***		
	BASE-jumpers	39	0.45	0.9	2.5 ***		
	Low risk sportsmen	53	0.11	0.9	1.0 ns		
	Non-sportsmen	89	0.09	1.2	1.0 ns		
Perceived comparative QRD in comparison with that of the non-specific referent ^b	High risk sportsmen	313	1.80	1.3	22.8 ***	F _(2, 451) = 1.98 ns	F _(2, 451) = 2.01 ns
	Paragliders	73	1.60	1.2	9.6 ***		
	Skydivers	201	1.76	1.3	18.8 ***		
	BASE-jumpers	39	1.91	1.4	6.3 ***		
	Low risk sportsmen	53	1.88	1.4	8.4 ***		
	Non-sportsmen	89	1.85	1.4	12.3 ***		
Perceived comparative VAD	High risk sportsmen	313	0.32	0.7	5.3 ***	F _(2, 452) = 2.28 ns	F _(4, 452) = 1.15 ns

in comparison with that of the specific referent ^a	Paragliders	73	0.21	0.7	2.1*		
	Skydivers	201	0.33	0.8	4.3 ***		
	BASE-jumpers	39	0.32	0.7	2.4 *		
	Low risk sportsmen	53	0.11	0.8	1.2 ns		
	Non-sportsmen	89	0.10	0.7	1.1 ns		
	High risk sportsmen	313	0.51	1.0	7.2 ***		
Perceived comparative VAD in comparison with that of the non-specific referent ^b	Paragliders	73	0.42	0.8	3.5 ***		
	Skydivers	201	0.55	1.0	6.8 ***		
	BASE-jumpers	39	0.45	1.0	2.7 **	$F_{(2, 452)} = 0.92$ ns	$F_{(4, 452)} = 1.75$ ns
	Low risk sportsmen	53	0.22	0.9	1.6 ns		
	Non-sportsmen	89	0.19	1.0	1.4 ns		
	High risk sportsmen	313	2.95	1.0	-		
Self-reported risky behaviors while driving a car	Paragliders	73	2.71	1.1	-		
	Skydivers	201	2.96	1.0	-	$F_{(2, 453)} = 4.31$ **	$F_{(4, 453)} = 6.5$ ***
	BASE-jumpers	39	3.39	1.0	-	high risk sportsmen > low risk sportsmen**, non-sportsmen **	skydivers, BASE-jumpers > low risk sportsmen *, non-sportsmen *
	Low risk sportsmen	53	2.23	1.0	-		
	Non-sportsmen	89	2.19	0.9	-		
	High risk sportsmen	313	1.27	0.6	-		$F_{(4, 450)} = 3.4$ **
Accident experiences ^c	Paragliders	73	1.22	0.4	-	$F_{(2, 450)} = 2.0$ ns	BASE-jumpers > low risk sportsmen

Skydivers	201	1.24	0.5	-	** , non-sportsmen **
BASE-jumpers	39	1.56	1.0	-	
Low risk sportsmen	53	1.16	1.1	-	
Non-sportsmen	89	1.18	0.4	-	

Note: ***, **, * significance level for t and F value $p < 0.001$, $p < 0.01$, $p < 0.05$, respectively. ns = non significant. t = one-sample t test value against 0. Possible range for perceived comparative QRD and VAD was -3 to +3. QRD = quality of reflexes while driving a car. VAD = vulnerability to be involved in road accident while driving a car.

^a The specific referent was the average same-age and same-sex French sportspeople driver. ^b The non-specific referent was the average same-age and same-sex French driver.

^c The three groups were the high risk sportsmen, the low risk sportsmen, and the non-sportsmen. ^d The five groups were the paragliders, the skydivers, the BASE-jumpers, high risk sportsmen, the low risk sportsmen, and the non-sportsmen. ^e Accident experiences while driving a car over the past 3 years, having necessitated medical attention.

Table 3

Multiple regression analyses with comparative optimism (CO) when comparing one's own vulnerability to road accident while driving a car (VAD) with that of the specific referent (i.e., the average same-age and same-sex French sportsmen driver), as the dependent variable (n = 455)

Independent variables	Groups						Subgroups					
	Non-sportsmen ^a		Low risk sportsmen ^b		High risk sportsmen ^c		Paragliders ^d		Skydivers ^e		BASE-jumpers ^f	
	Beta	t	Beta	t	Beta	t	Beta	t	Beta	t	Beta	t
Accident experiences while driving a car	-0.22	-2.4**	-0.19	-2.1*	-0.02	-0.49	0.08	0.69	-0.06	-0.86	0.00	0.03
Self-reported risky behaviors while driving a car	-0.14	-1.27	-0.11	-1.19	-0.10	-1.49	0.11	0.87	-0.07	-1.00	-0.18	-1.04
CO regarding QRD^g	0.11	1.26	0.15	1.29	0.27	3.65***	0.01	0.06	0.27	2.89**	0.64	2.87**

Note: ***, **, * significance level for *t* value $p < 0.001$, $p < 0.01$, $p < 0.05$, respectively. ^a R² = 0.11 (adjusted R² = 0.10). ^b R² = 0.09 (adjusted R² = 0.08). ^c R² = 0.13 (adjusted R² = 0.11). ^d R² = 0.02 (adjusted R² = 0.02). ^e R² = 0.14 (adjusted R² = 0.12). ^f R² = 0.23 (adjusted R² = 0.19). ^g CO regarding QRD = Comparative optimism when comparing one's own quality of reflexes while driving a car (QRD) with that of the specific referent (i.e., the average same-age and same-sex French sportsmen driver).