

A photograph of a person's hands on a steering wheel, with one hand holding a smartphone. The image is overlaid with a semi-transparent teal color. The text is white and centered.

# *Expert Views*

## **Safe Driving and Behavioral Economics**

**SCOR**  
The Art & Science of Risk

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## Introduction

### Background

At the beginning of the pandemic in early 2020, roads became suddenly quiet. Due to strict quarantine orders, road traveling was drastically reduced. Records show that this unprecedented event cut overall traffic by up to 65% in the US at one point.<sup>1</sup>

But did the decreased traffic volume reduce road fatalities? Some records around the globe say no. Road fatalities rose unexpectedly during the later stage of the pandemic as one of the adverse side effects of the pandemic. The rapid increase in road traffic collisions has become a serious global health, life, and business problem, causing around 1.35 million deaths per year worldwide and costing around \$1.8 trillion every year.<sup>2</sup>

Covid-19 left roads around the world a more dangerous place, directly impacting insurance companies. How can we reverse the trend? The problem runs deep, and it is highly difficult to tackle the issues with a traditional approach such as more driving education, stricter regulation, or just raising insurance premiums.

It is time that insurance companies give this issue a fresh look and think differently. What other approach can be taken if the conventional methods are not stopping this global trend of rising road fatality? We suggest utilizing the latest technology and a new way of looking at human behavior - connected car insurance powered by telematics and behavioral science.

### Connected Car Insurance and Telematics

Connected car insurance is a type of auto insurance powered by telematics, which combines telecommunication and information, using digital devices that collect data on drivers' behavior to assess risk and set insurance premiums. Since its emergence in the early 2010s, it has been steadily increasing in popularity and capability. According to DriveQuant, a leading telematic company which designs mobile applications and software development kits, this is thanks to the continuous

digital transformation of the insurance sector and the birth and democratization of IoT (Internet of Things). The telematics market is expected to grow even further, driven by the increasing use of IoT, the rising popularity of usage-based insurance (UBI), and the continuous advancement of technology.

Connected car insurance combined with telematics technology and behavioral science can greatly add value to the growth of this market, as the combination will contribute to safer driving. Behavioral science plays a significant role in shaping the design and implementation of telematics-based insurance programs. This approach may have great potential for a breakthrough to reverse this trend of increasing road fatality. How exactly does behavioral science contribute to the effective design of connected insurance? Below is a brief overview of behavioral science and several of its techniques that can be used to enhance connected car insurance programs.

#### How Behavioral Science Enhances Connected Car Insurance Program

Behavioral science is a relatively new field of study, but its roots have a deep, complex and long history. The field of behavioral science combines insights from psychology, economics, neuroscience, and other disciplines. Through research and experimentation, behavioral science can shed light on how individuals make decisions, what motivates us to take certain actions, and the biases that often prevent them from fulfilling their goals. This field can also lead to practical techniques to improve decision-making processes and help individuals live happier, healthier, safer lives.



SCOR's Behavioral Science Team applies these techniques to reimagine and improve various aspects of the insurance journey. One recent advancement in this field is focused on combining telematics technology with behavioral principles. After all, telematics is about measuring and

improving one specific human behavior—driving. So, applying behavioral science concepts and methodology will naturally contribute to increasing driving safety and the overall success of telematics programs.

## Applicable Behavioral Science Techniques

Behavioral Science has numerous concepts and techniques that can be used to understand and influence human behavior for different purposes and situations. What are the most relevant techniques and principles for telematics and connected car insurance?

### Overconfidence bias

Overconfidence bias is the tendency for people to overestimate their abilities, which could lead them to engage in risky behaviors, such as drinking, gambling, and speeding. There is a long history of research showing that most drivers are overconfident in their driving abilities. One study found that even drivers who had caused an accident rated themselves as close to “expert” drivers.<sup>3</sup> Remark's 2022-23 Global Consumer Survey confirms these findings by showing that 86.5% of drivers rate their driving abilities, on a scale of 1 to 5, as a 4 or 5, making them above-average.<sup>4</sup> It is statistically impossible for all of these ratings to be correct, as only 50% of drivers can be in the top 50% of driving ability.

This overconfidence bias has been observed in both men and women<sup>5</sup> and even in expert drivers.<sup>6</sup> Further research revealed the dangers of this overconfidence. It was most pronounced in the aspects of driving ability most important for accident prevention.<sup>7</sup> Additionally, drivers were still overconfident about their driving ability when under the influence of central nervous system drugs.<sup>8</sup>

This research suggests that one major cause of unsafe driving could be overconfidence bias among drivers. How can behavioral science techniques curb this overconfidence and increase driving safety? There are countless ways, but one

example is to show drivers feedback about their driving performance. This could be in the form of a driving score or the number of times they hit their brakes compared to the average. This feedback reminds drivers that their driving is not as safe as they perceive it to be.

### Real-time feedback

Though the results are mixed, the literature from other domains where overconfidence is observed (market competition, reasoning ability, IQ) shows that feedback about one's performance or the performance of others can reduce overconfidence bias.<sup>9</sup> One study further found that it is unskilled participants that are most responsive to feedback in curbing their overconfidence.<sup>10</sup> This is an encouraging result in the context of driving safety, where the overconfidence of the least skilled and least safe drivers is likely to be the most dangerous for themselves and others.

This result also seems to be supported by one of the few studies studying this effect in the domain of driving safety.<sup>11</sup> In this study, every time drivers made a trip, their performance was monitored for safety factors such as speeding and harsh braking. After each trip, drivers were given detailed feedback on their driving performance.

The research focused on how drivers' performances changed in the trips they made directly after viewing this feedback. Drivers who received strongly negative feedback, stating that their driving was very unsafe, improved their performance in their next trip. The feedback seemed to work in curbing their overconfidence and leading them to focus more closely on safe driving.



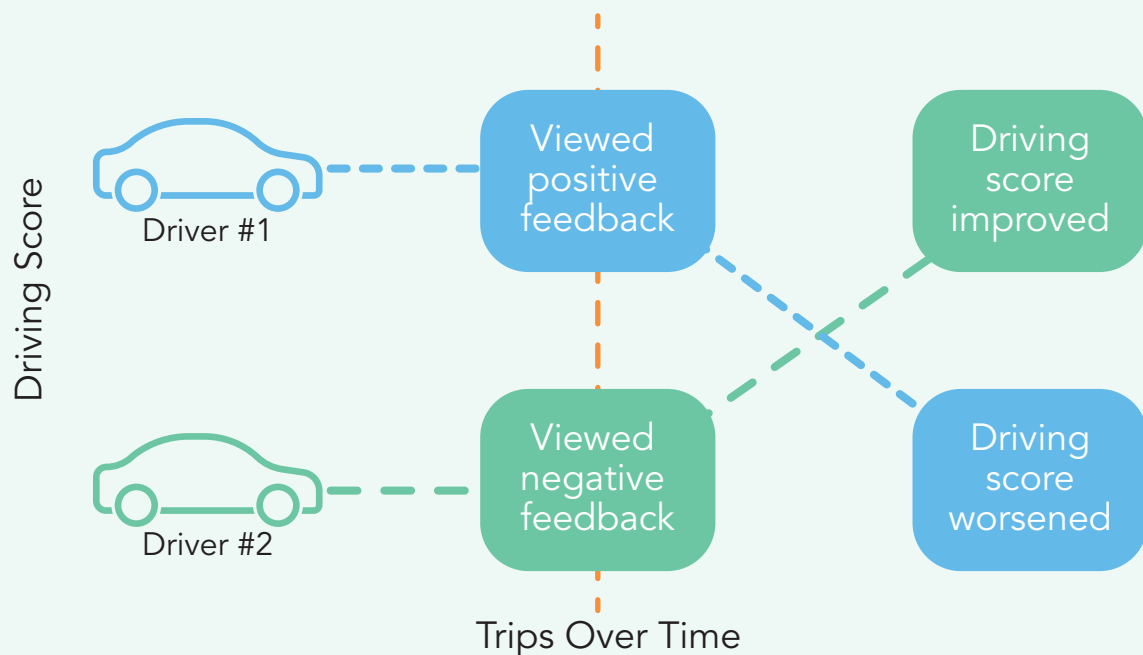
Unfortunately, this study also presents a warning for insurance companies to keep in mind when designing telematics programs. Drivers who viewed positive feedback about their performance (who were told that their driving was safe) performed worse on their next trip (see Figure 1 below). In this case, the study's authors theorize that this positive feedback fueled drivers' overconfidence, leading them to disregard driving safety requirements in their next trip because they believed themselves to be good enough drivers to get away with it.

How can telematics programs incorporate feedback that curbs overconfidence instead of fueling it? One option, recommended in this study, would be to only show drivers negative feedback. Another, perhaps more useful option, is to combine feedback with an "injunctive nudge".

## Injunctive Nudges

An injunctive nudge is a short message presented to individuals that instructs them to act in a certain way. These instructions can be combined with rewards, consequences, or further explanations. The goal of using nudges like this is to intervene at key decision-making moments and gently push an individual toward making better choices. In the field of driving safety, injunctive nudges can be used along with feedback to influence drivers to drive more safely without feeding their overconfidence. The idea would be to keep the helpful effects of giving drivers negative feedback while avoiding the unintended consequences of positive feedback. Even if a driver receives positive feedback, they are reminded by the nudge to continue focusing on driving safely.

Figure 1: Driving score responses to positive and negative feedback.







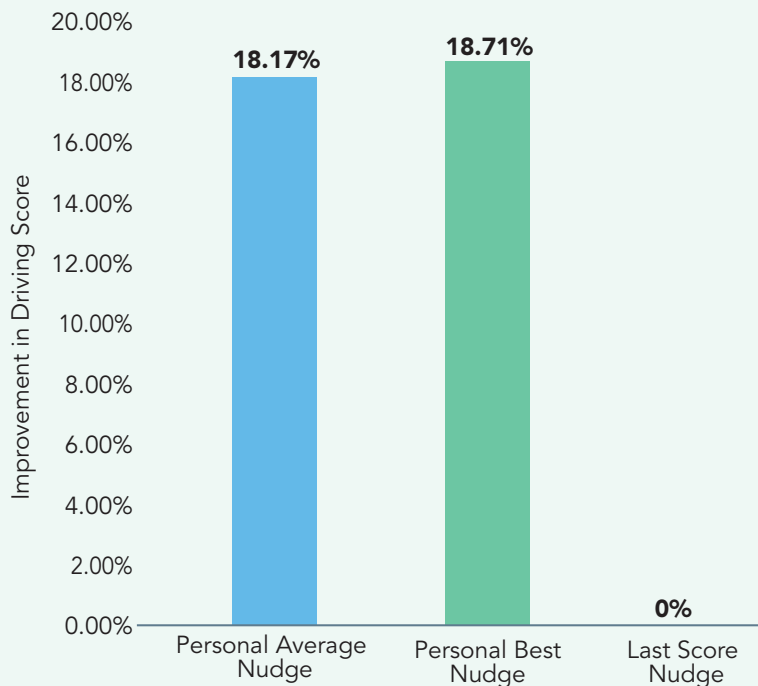
In a study about the effect of these types of nudges, researchers presented all drivers with a driving performance score.<sup>12</sup> However, for some drivers, this feedback was combined with one of the following injunctive nudges:

- **Personal Average Nudge:** “Aim to beat your personal average score of [insert personal average score]”
- **Personal Best Nudge:** “Aim to beat your personal best score of [insert personal best score]”
- **Last Score Nudge:** Aim to beat your last trip score of [insert last trip score]”

Consistent with the results from the experiment above testing positive vs. negative feedback, focusing drivers on their last score was not effective in improving their performance on their next trip (see Figure 2 below). This could be because positive feedback produced an overconfidence effect that overcame the effect of the nudge.

However, the personal best and personal average nudges were successful in improving drivers’ performance. Both interventions improved the next driving score by around 18%. The researchers estimated that this increase in driving safety meant that the participants would, on average, be able to drive for nearly two years longer without an accident than they would have before the feedback and nudge. There is clearly potential for combining nudges and feedback to promote driving safety.

Figure 2. Improvement in driving score after different nudges.





## Conclusion

The three techniques discussed in this report are good examples of how behavioral science can help insurers analyze and understand human behavior and suggest new and practical solutions for reducing road fatality risks. There are also many other behavioral science concepts and methods that can contribute to enhancing safe driving practices. Insurers are encouraged to explore various options and adopt advanced technological solutions such as telematics. Behavioral science-based telematic solutions are highly effective as they provide insights into the complex factors influencing insureds' driving behavior. These insights can be used to develop effective interventions and strategies that promote safe driving, ultimately leading to lower risks for insurers.

## Endnotes

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