Cyclists' Acceptance of Technologies Aimed to Improve Safety: A Classification Tree Analysis

Víctor Marín Puchades, Marco de Angelis, Federico Fraboni,
Luca Pietrantoni, Gabriele Prati
Department of Psychology, University of Bologna, Italy
victor.marinpuchade2@unibo.it

Introduction

New on-bike safety technologies are being developed. Such devices need to be accepted by the end user in order the meet their purpose.

Which variables can better categorize users according to their intention to use the system?

The purpose of the present study is to find out how bicycle use, perceived competence and socio-demographic factors can predict differences in intention to use two newly developed attachments aimed at increasing cycling safety.

Method

We administered a questionnaire to 298 Italian cyclists assessing:

- Weekly use of the bicycle
- Past crash experiences
- Perceived competence (perceived control over the bike): 6 items; from 1 (completely disagree) to 5 (completely agree) (Chaurand and Delhomme, 2013)
- Behavioral intention to use

   (1) a saddle that vibrates when there is risk of a collision with a motorized vehicle

   (2) a LED light that blinks faster as cars approach from the rear

We employed CHAID Decision Tree analysis to discover which one of the variables better classified users according to their behavioral intention to use.

Results

80% of cyclists have low or no intention to use **an haptic-based system like the saddle device.**

Higher and lower levels of perceived competence predicted more participants with less intention to use the system (83.8% and 84.4% of the participants, respectively, with low or no intention at all). Whereas medium levels of perceived competence were associated with a 33% that had higher intention to use, although still, 66.7% of the participants had low or no intention.
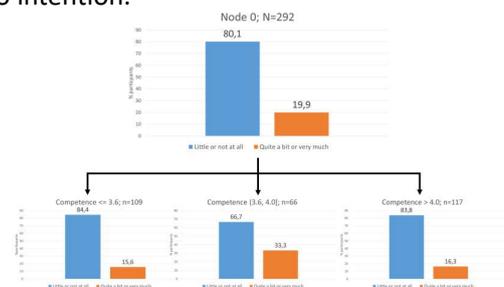
37% of cyclists have low or no intention to use **a visual-based system like LED technology.**

Those with lower perceived competence were more prone (69.7%) to be willing to use the system in comparison with those that have lower perception of competence (52.1%).

Conclusions

The intention to use different types of bike-safety technologies might depend on different users' characteristics and experiences. Perceived competence can play an important role in the intention to use a safety-related system. Regarding on-bike haptic systems, those with more competence might not be so willing to use the device because they might think they can get by without it. Whereas those with lower level of competence might feel daunted by a vibration that can potentially lead to an accident. As for the visual-based system, cyclists with lower competence might be more prone to find the information provided by the system useful. Future search should explore how perceived competence may influence intention to use other systems.

References
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