Building Blocks of Responsibility

A CONCEPTUAL MODEL ILLUSTRATING THE FACTORS INFLUENCING PERCEIVED RESPONSIBILITY OVER THE DRIVING TASK WHEN INTERACTING WITH AUTOMATION SYSTEMS

Linnéa Lidander¹, Fjollë Novakazi², Gustav Erhardsson³

¹Public Safety, CSAM - The eHealth Company, Sweden, ²UX Research, Volvo Cars & Chalmers University of Technology, Sweden, ³Nexer Teach Talent, Sweden

PROBLEM STATEMENT

Applied to the context of driving, there are many laws and regulations that define what responsibilities come with the privilege of driving and how drivers are supposed to act. These regulations are put in place to enhance safety for all road users, but may not be able to be evaluated situations after an accident and hold actors accountable for unsafe behavior and actions. However, the 2017 Traffic Safety Culture Index [9] revealed that while most drivers desire a greater level of safety, their actual behavior often contradicts their attitudes.

Novakazi and colleagues [7] investigated how perceived control influences the responsibility the driver perceives over the driving task; however, it suggested that control is not the only reason why drivers feel responsible over the driving task. Especially regarding the introduction of driving automation systems, which aim to relieve the driver partly or fully of the driving task, the question of who is responsible over the driving task at what time becomes highly critical.

Therefore, there is a need to understand the building blocks of the subjective responsibility drivers have over the driving task when engaging with driving automation systems. Hence, this work investigates the factors influencing the driver’s perceived responsibility over the driving task and propose a conceptual model, which focuses on explaining the drivers subjective view of responsibility and how the interpretation of different information leads to the perception of with whom the responsibility lies - the driver or the vehicle.

DISCUSSION AND IMPLICATIONS

The presented conceptual model aims to shed a light on the building blocks of responsibility during driving. This topic is especially relevant when considering nowadays technological development enabling semi- to highly automated driving systems in vehicles, where drivers find difficulties to distinguish who is in charge of the driving task [2]. This can happen for example when the actual ability of the driving automation is perceived higher than it is, and the driver falsely assumes that the vehicle is in control of the driving task. A mismatch in assessing the responsibility can have hazardous consequences, especially when this affects the driver’s mode awareness [4].

One reason for confusion over the who is in charge of the driving task may be that the relationship and the allocation of responsibility between human and automation system are not clearly defined [9] [10].

Hence, a key factor for a successful development of driving automation is that the drivers understand their own responsibility over the driving task, no matter the level of automation. The conceptual model “Building Blocks of Responsibility” highlights that perceived control affects the drivers perceived responsibility and how that is connected to and influenced by other types of responsibility, such as contextual and individual factors and can therefore aid a transparent system design, which supports the drivers’ mental models and their understanding of their responsibility over the driving task at all times.

REFERENCES