

WHAT DRIVES PEOPLE'S CHOICE IN SPEED SUPPORT?

The acceptability of Intelligent Speed Assistance (ISA)

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ABSTRACT

Speeding is generally considered to be a major cause of road traffic accidents. Several trials with different types of in-car speed assistance systems, in particular Intelligent Speed Assistance (ISA), have shown that ISA can be an effective way to reduce speeding. A basic condition for achieving significant improvements in safety involves the acceptance of ISA among vehicle drivers on a large scale. This paper focuses on the issue of acceptability of ISA. It is based on a large-scale survey of 6370 individuals in Belgium (Flanders region) and 1158 persons in the Netherlands. The methodology to define our concept, the construction of the questionnaire, first descriptive results and the future steps in the development of our model are described.

KEYWORDS

Acceptance, public support, intelligent transport systems, social acceptance.

INTRODUCTION

One of the most promising ADAS, aiming at reducing inappropriate speed, is Intelligent Speed Assistance (ISA). ISA-devices can be categorized into different types (Morsink, et al., 2006) depending on how intervening (or pre-emptive) they are. Speaking about implementation, it is also important to know whether the system will be accepted. A distinction is made between ISA acceptability, ISA acceptance and ISA adaptation. Acceptability implies the prospective judgment of measures to be introduced in the future, i.e.

the target group will not have experienced any of these measures, making “acceptability” an attitude construct. Acceptance is considered to be the reaction (beliefs and attitudes) of individuals, based on their behavioural reactions after the introduction of a measure or device. ISA adaptation refers to changes in driving behaviour caused by using ISA. However a clear definition of what acceptance and acceptability are or how they should be measured is still missing. Our research will focus on acceptability.

The lack of a theory and definition regarding acceptance and acceptability has resulted in a large number of different attempts to measure ITS acceptance, often with quite different results (Adell, 2008). Some existing theories were used to measure these within the acceptance and acceptability research of ITS. In our research we aimed to improve on this lack of knowledge by constructing a framework to define acceptability.

RESEARCH METHOD

Based on different socio-psychological theories and methods used in ISA trials we found 14 relevant indicators that we divided into general indicators (related to persons’ psyches, social values and norms at that time, and so on) and device-specific indications (factors that are directly related to the device itself) (Vlassenroot et al., 2010). These 14 indicators were presented to randomly selected respondents (through new Internet media) in a test survey. The main goal of this survey was to find if the distilled indications and the questions were relevant, and if some relations could be found between the indicators. Through the use of factor analysis we found out that our questions were relevant for every item and some correlations were found between the items. It is also noted that some indicators would directly influence the acceptability of ISA while some would influence others more indirectly. This first step in our research enabled us to conduct a relevant large-scale survey among the general public in The Netherlands and Belgium on the acceptability of ISA.

Secondly, the final web-based survey was put online at the end of September 2009. The web-address of the survey was published by the Flemish and Dutch motoring organisations. In particular, in Flanders an email newsletter was sent to the VAB members. In the Netherlands, the link to the survey was first only announced on the ANWB website. Because of the initial low response rate in the Netherlands an additional email newsletter was sent, but only to the ‘active members.’ (i.e. members that pay a fee to ANWB for several kinds of services). In total 6370 individuals responded to the web-survey in Belgium and 1158 persons in the Netherlands. Of these 7528 respondents 5599 responses of car drivers were considered useful for further analysis.

The final step, based on the results of the large-scale survey, is to define how the indicators relate to each other and how well they would predict the acceptability based on the conceptual model. Structural Equation Modeling (SEM) will be used to construct our model.

FIRST RESULTS

The high response rate makes the current survey one of the most successful surveys held on acceptability of ISA in Europe. It is however stated that our results cannot be generalised to all the drivers in Flanders and the Netherlands, as the sample seems to represent the driving population only on mileage. The general indicators revealed that the drivers’ opinions on the current posted speed limits were positive. The drivers would mainly maintain the speed if

they are driving in urban area, although in 30 kph-zones they would speed more often. These results are in line with the Belgian, Dutch and Swedish ISA-trials.

The respondents considered that behavioural aspects would have a higher influence on the cause of an accident than contextual issues. The drivers were also relatively positive about the use of ITS to support their driving behaviour. Already in 2004, the SARTRE research project indicated that drivers rated the use of certain ITS as positive, although the choice between the systems was limited (GPS, ISA, alcohol-lock, driving monitor). In our study it is noted that for these devices the ratings were even higher. This can be a good indication that drivers would like to have even more support when driving. Almost 95% of the respondents stated that they are in favour of a certain ISA-system. In many studies, effectiveness was found as a relevant criterion to determine acceptability, however it was also stated that there is a difference in peoples' opinion on the effectiveness and the found results in trials. In our study, open systems were found the most effective ones, although it is stated from a safety point of view that (semi)-closed systems are better. Morsink et al. (2006) explained this as the 'acceptance versus effectiveness' paradox: the more intrusive and controlling ISA systems are, the more positive effects they have on speed behaviour of drivers. However, these more effective but also more intervening ISA systems, at the same time turned out to be the less acceptable types of ISA systems.

Closed ISA was more preferred (it was even found more satisfying and useful) than supportive ISA. This can be reported as a remarkable result. This might be explained by the fact that for the respondents it was more difficult to understand how the supportive systems exactly work in practice and therefore it was less preferred.

Although the support for ISA is high, the respondents indicated that it would not be unconditional. The more intervening the implemented system would be, the higher the penetration level has to be. This level of 'equity' is mostly not investigated in other trials or ISA-researches. However, in other traffic and transport studies (e.g. tolling) this is more investigated and gave a good indication for future implementation actions. For whom a specific system type should be implemented has been studied in most ISA-studies. In our study, young and professional drivers (especially trucks and buses) should have a more intervening system. This was also stated in other trial reports, however in our survey still many respondents stated that ISA would be beneficial for all the drivers. Like in many ISA-studies the implementation of restrictive ISA would be a good solution to stop frequent speeders.

This study also indicated that incentives could increase the support for more intervening systems however it would still be difficult to lead people accept restrictive ISA. A market-driven implementation would be sufficient enough to implement the open systems. Tate & Carsten (2008) examined a market driven scenario in which drivers choose to adopt ISA and an authority driven scenario with more encouragement of ISA adoption. The analysis indicated that over a 60-year period from 2010 to 2070, the market driven scenario is expected to reduce fatal accidents by 10%, serious injury accidents by 6%, and slight injury accidents by 3%. The authority driven implementation scenario is expected to reduce fatal accidents by 26%; serious injury accidents by 21%; and slight injury accidents by 12%.

CONCLUSION

To conclude, this study indicated that ISA is acceptable for most of the drivers, which is positive in terms of potential implementation. The high possible acceptability of ISA by the

drivers should also be stimulating in further development of the feasibility framework of ISA and other ITS by the governments. Many ITS, like ISA will need road information like the speed limits: most of these speed limit databases are in development or premature for high-scale use.

This study is also an attempt to come to a more general framework in the field of ISA and ITS acceptability. Many studies on acceptability can be criticised for not being sufficient enough. This study wants to contribute in the development of a more robust framework.

The final step in this research, based on the results of the large-scale survey, is to define how the indicators relate to each other and how well they would predict the acceptability based on the conceptual model

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