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Comprehensibility of traffic signs among urban drivers in Turkey

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ABSTRACT

Traffic signs are commonly used traffic safety tools, mainly developed to provide crucial information in a short time to support safe drive; but the success depends on their comprehensibility by the drivers. Also, a sudden change in the traditionally used and accepted signs can cause significant safety problem, as in the case of cancellation of red oblique bars in 2004 as a part of the European Union Harmonization Process of Turkey.

Having a severe traffic safety problem in Turkey, a need to assess both the comprehensibility of internationally accepted traffic signs and current level of driver education, was the main motivation behind this study. A paper-based survey study in 2009 that reached a sample of 1478 urban drivers in the City of Ankara, focused on the determination of comprehensibility of 30 selected traffic signs, which are commonly used and critical for safety, including two recently changed signs. The meaning of each sign is sought using an open-ended question format to capture different levels and types of comprehensions, which enabled the detection of "opposite" and "partially correct" answers besides "wrong" and "correct" ones. High comprehensibility of 9 control group signs shows the validity of the study. The recently changed signs are among the oppositely associated ones proving the increased risk in traffic safety and need for more aggressive campaigning to publicize them.

1. Introduction

Due to technological and economic developments in recent years, the number and quality of motor vehicles have increased in Turkey; unfortunately, this has also increased the number of accidents and fatalities. As a result, Turkey is listed among the first 10 countries with the highest number of traffic accident fatalities, approximately 4500 fatalities every year. The economic cost of road crashes and injuries is estimated to account for 2.1% of the gross national product (GNP) of Turkey (TURKSTAT, 2010). Located at the crossroads of international routes between Europe and Asia, Turkish leaders realized the importance of using internationally accepted traffic signs and signals, following the Vienna Convention since its acceptance in 1968. More recently in 2004, the ongoing European Union (EU) Harmonization Process required major changes in some of these traffic signs to further follow the European Agreement (EA) supplement of the Vienna Convention. Considering the ongoing EU application of Turkey, the traffic safety problem in Turkey is expected to have an impact on the safety of regional traffic, as well.

A general analysis of the causes of traffic accidents shows that majority are due to driver mistakes and traffic violations. One major factor affecting safe driving is the comprehensibility of traffic signs by drivers. Some solutions to increase sign comprehensibility focus on modifying them to create local signs or supporting signs with additional text on or under them (Yakut, 2006). In 2008, additional text in signs was proposed to the Turkish Highway Traffic Safety Committee (HTSC), an official and multi-organization platform. The committee decided to get the comprehensibility of currently-used signs assessed first; this was the main motivation behind the study, which is partially presented here. The HTSC chose to form a "work group" including professionals from traffic enforcement, engineers and psychology, and driver education to (i) define the scope of the study, (ii) select the critical signs, and (iii) design the survey questionnaire.

Due to financial and time limitations, the work group decided to focus on the evaluation of urban drivers (including professional drivers working in mass transit systems, taxis and shuttle services) and selected 30 signs expected to have a significant effect on traffic safety. Signs with pictorial designs, which were expected to have high comprehensibility, were added as a control group. Two of the studied signs were selected among those that were changed as a part of the EU Harmonization Process; for these signs, comprehensibility of both the previous and new designs was evaluated to assess the impact of the recent changes. A survey study of over 1478 unpaid participants was conducted in 2009.

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