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The Use of Modified Emoticon Symbols for the Designs of Traffic Warning Signs

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Abstract: Human error has been distinguished as the cause of traffic accident. It is influenced by a number of factors coming from the drivers who have no safety awareness, including distraction, fatigue and behavior. There needs the designs of traffic warning signs regarding to the drivers' behavior in order to communicate the inappropriate things which they must avoid. There are four kinds of designs deriving from the modified emoticon symbols depicting aggressive driver, anger driver, distract driver and fatigue driver which had been tested to respondents. They stated that those designs are quite easy to understand, enough to attract attention, quite easy to remember and sometimes regards to what they had ever undergone. The use of emoticon symbols in the traffic system would become an innovative breakthrough in communicating the instructional information and warning toward the drivers, particularly those who often experience as what these symbols convey.

Key words: Human error, emoticon, warning sign, easy, Indonesia

INTRODUCTION

The traffic accidents are 93% commonly caused by the human error which is 57% of the drivers behaviour, 26% of the insufficient road safety, 6% of the vehicle trouble and 4% of insufficient both road and vehicle factors (PIARC, 2003). The human error is commonly caused by 3 cases, consisting of the distraction, fatigue and behaviour.

Distraction is caused by using of cell-phone while driving (Tison *et al*., 2011; Lesch and Hancock, 2004; Patel *et al*., 2008; Hancock *et al*., 2003), talking to passengers (McEvoy *et al*., 2007), making up or reading a map (Patel *et al*., 2008) and others. Fatigue is caused by exhaustion which regards to the energy deficiency, physical incapability, less motivation and drowsiness (Ahsberg *et al*., 1997; Radun and Radun, 2009). Behaviour of the driver which does not regard to the driving saftey is caused by the lack of driving experiences (Heck and Carlos, 2006; Tseng, 2012), emotion (Summala, 2005) or the aggressiveness (Tay, 2005), the tendency of making deviation (Hassen *et al*., 2011) and being drunk (Ma *et al*., 2010).

Emoticon is actually the acronym of emotional icon. Emoticon is used as the relational icons to express the mood or emotion or to give the sign toward the intention of joking. Some popular emoticons include smiling, blinking, getting angry and frowning. Emoticon is the visualization formed by common flipped typographic symbols as the representation of emotion. It is created as the compensation from the disability in delivering voice message, mimic, or gesture in the written communication. Therefore, it facilitates the combination of both written message and face to face interaction describing what is being symbolized by the writer toward the readers (Rezabek and Cochenour, 1998).

Emoticon based on ASCII is supposed firstly used in cyberspace by a scientist, named Scott Fahlman in 1982. The origin of emoticon began when he used the symbol to show that a sentence which he sent meant as a joke and opposed to the symbol " : ", since it is used to show the communicator's emotion. If the unit of linguistic tends to shift toward the use of graphic emoticon globally, then we will be able to design a universal visualization as the extra language of communication using computer and mobile devices. Since, the people can understand the simple visualization, thus the international communication will run easier and be able to overcome any obstacle of language differentiation (Junichi and Martin, 2008).

MATERIALS AND METHODS

Designs description and statistical methodology: Specification and description for Fig. 1 design a is an aggressive driver, depicted by the vertical wrinkle on the forehead with one aspect of lip is lower than other, oblique position and unstable way of driving. This implies that the driver is in a high enthusiasm and tends to be

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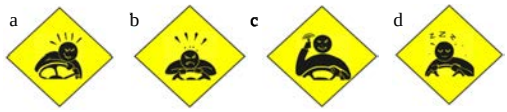

Fig. 1: Traffic warning signs design

careless, supposing able to do anything without considering others' safety. This kind of drivers tends to provoke others, do a zig-zag or have no concern for the safety space and tends to break the traffic. Design B is an anger driver, depicted by the drawn eyebrows, closed mouth, wrathful and morose expression, upright position and psychological stress represented in his way of driving. This kind of drivers tends to be intolerant, egoistic and cruel in judging others using risky steps. Design C is a distract driver, depicted by the closed mouth with a big smile for being in pleasure, upright position in his way of driving but focus in talking to a certain person by cell-phone. This kind of drivers tends to have no awareness or simply careless to other vehicles and traffic, since they do not realize that this kind of action can be dangerous either for them or others. Design D is a fatigue driver, depicted by the closing eyes and flat mouth, upright position in his way of driving but physically incapable and has no awareness for the danger that he probably cause either toward himself or others.

The participants involved in this research belong to 50 students who have owned driving license, including 35 male and 15 female students by the age interval between 19 and 23 years old. Scrutinizing the respondents' notions toward 4 designs of traffic warning signs of the modified emoticon symbols uses self report technique of likert scale, particularly the summated rating scale, regarding to the comprehension, conspicuity, learnability and relevance toward the signs of aggressive driver, anger driver, distract driver and fatigue driver.

The respondents' notions for the comprehension toward the traffic warning signs of aggressive driver, anger driver, distract driver and fatigue driver is classified into 5 kinds of scoring, in which 5 means as "it is easy to understand", 4 means as "quite easy to understand", 3 means as "be easily understood", 2 means as "less easy to understand" and 1 means as "very not easy to understand". The respondents' notions for the conspicuity toward the traffic warning signs of aggressive driver, anger driver, distract driver and fatigue driver is classified into 5 kinds of scoring, in which 5 means as "very interesting", 4 means as "enough to attract attention", 3 means as "to attract attention", 2 means as "less draw attention" and 1 means as "very inconspicuous". The respondents' notions for the learnability toward the traffic warning signs of aggressive driver, anger driver, distract driver and fatigue driver is classified into 5 kinds of scoring, in which 5 means as "it's easy to remember", 4 means as "quite easy to remember", 3 means as "to make it easier to remember", 2 means as "less easy to remember" and 1 means as "difficult to remember". The respondents' notions for the relevance toward the traffic warning signs of aggressive driver, anger driver, distract driver and fatigue driver, is classified into 5 kinds of scoring, in which 5 means as "very often", 4 means as "often enough", 3 means as "somewhat frequently", 2 means as "sometimes" and 1 means as "never".

RESULTS AND DISCUSSION

Reliability statistics for 16 variables gotten from 4 kinds of tested designs show the value of Cronbach alpha equals to 0.872. This means that the values from every variable stated as reliable.

Table 1 and 2 states the result from 4 kinds of traffic warning signs of modified emoticon symbols to repondents. The median resulted shows the comprehension toward aggressive driver equals to 4.00 (quite easy to understand), anger driver equals to 4.00 (quite easy to understand), distract driver equals to 4.00 (quite easy to understand) and fatigue driver equals to 4.00 (quite easy to understand). The conspicuity toward aggressive driver equals to 4.00 (enough to attract attention), anger driver equals to 4.00 (enough to attract attention), distract driver equals to 4.00 (enough to attract attention) and fatigue driver equals to 4.00 (enough to attract attention. The learnability toward aggressive driver equals to 4.00 (quite easy to remember), anger driver equals to 4.00 (quite easy to remember), distract driver equals to 4.00 (quite easy to remember) and fatigue driver equals 4.00 (quite easy to remember). The relevance toward the sign of aggressive driver equals to 2.00 (sometimes), anger driver equals to 2.00 (sometimes), distract driver equals to 2.00 (sometimes) and fatigue driver equals to 2.00 (sometimes). This means that 4 traffic warning signs of the modified emoticon are proper to use for their benefits.

The proper designs of traffic warning signs come from the drivers' notions toward the meaning represented by the sign itself (Garvey *et al*., 1997; Swanson *et al*., 1997; Lesch, 2003; Al-Kaisy, 2006; Razzak and Hasan 2010;Wogalter *et al*., 1998), interest of the drivers or conspicuity (Dewar *et al*., 1997; Lesch, 2003; Koppa, 1992), simplicity to remember or learnability, correlation toward the drivers' experiences or relevance.

The statistical data derived from the respondents' notions show that 4 traffic warning signs has the median

Table 1: Descriptive statistic

N	Gender	Comprehension for design A	Conspicuity for design A	Learnability for design A	Relevance for design A	Comprehension for design B	Conspicuity for design B	Learnability for design B	Relevance for design B
Valid	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Missing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	1.30	4.00	3.86	4.28	2.12	4.10	3.94	4.26	2.00
Median	1.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	2.00
Mode	1.00	4.00	4.00	4.00	2.00	4.00	4.00	5.00	2.00

Table 2: Reliability statistics

N	Gender	Comprehension for design C	Conspicuity for design C	Learnability for design C	Relevance for design C	Comprehension for design D	Conspicuity for design D	Learnability for design D	Relevance for design D
Valid	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00
Missing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mean	1.30	3.80	3.84	3.92	2.14	3.70	3.68	3.60	2.00
Median	1.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	2.00
Mode	1.00	4.00	4.00	4.00	2.00	4.00	4.00	4.00	2.00

score equals to 4 from the total score 5 toward the comprehension, conspicuity and learnability. This shows that drivers commonly state that emoticon traffic warning signs depicting aggressive driver, anger driver, distract driver and fatigue driver are quite easy to understand for the comprehension, enough to attract attention for the conspicuity and quite easy to remember for the learnability. The emoticon traffic warning signs show the score 2 from the total score 5. It means that the conditions represented in the designs of aggressive driver, anger driver, distract driver and fatigue driver are sometimes experienced by the drivers.

CONCLUSION

The using of pictorial symbols from the modified emoticon in the traffic system can be an innovative breakthrough in communicating the instructional information to the drivers, particularly those who experience the message represented by the symbols. The use of emoticon symbols in the designs of traffic warning signs can be understood broadly, mainly by those who are illiterate or problematic in linguistic.

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