

# YOUNG THAI MEN DRIVING DANGEROUSLY: A CROSS-CULTURAL VALIDATION STUDY OF THE MOTIVES FOR DANGEROUS DRIVING SCALE (MDDS)

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**Abstract:** The present study was conducted to investigate the cross-cultural reliability and validity of the Motives for Dangerous Driving Scale (MDDS) as a multidimensional measurement tool that can tap into different motives underlying dangerous driving among young Thai male drivers. The sample consisted of 300 participants aged between 18 to 28 years. Exploratory factor analysis yielded a three-factor structure underlying the Thai-based MDDS. These three factors represent three major motives for dangerous driving among young Thai male drivers: ‘driving fast/taking risk,’ ‘confidence in one’s driving skills,’ and ‘disrespect for traffic laws. These three factors are highly similar to the three-factor structure identified for the original Australian-based MDDS. Reliability analysis indicated that the three motives for dangerous driving and their 31 representative items are internally consistent based on their computed Cronbach’s alphas and their items’ IT correlations. Tests of both convergent and criterion-related validity support the conclusion that the Thai-based MDDS is valid by these two criteria.

**Keywords:** Road Traffic Crashes, Motives, Dangerous Driving Scale.

## Introduction

Injuries and deaths resulting from road traffic crashes are a major and rising worldwide public health problem. Indeed, the present trend shows that the third leading global burden of disease and injury will be road traffic injuries by 2020 (Murray & Lopez, 1996). Moreover, the International Federation of Red Cross and Red Crescent have stated that the road traffic burden is “a worsening global disaster destroying lives and livelihoods, hampering development and leaving millions in greater vulnerability” (Cater & Walker, 1998, p. 20). This is not surprising as road traffic injuries cause an estimated 1.24 million deaths each year worldwide and some 50 million people are injured or disabled every year. Moreover, road traffic deaths are the most significant cause of death among those aged 15-29 years (World Health Organization, 2013). On average, 3,242 people die daily from road accidents (Peden, 2004). Unless there is new commitment in prevention, the number of road traffic

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deaths and injuries are predicted to increase over the next 20 years by about 65% (Murray & Lopez, 1996).

#### *Road Traffic Crash in Thailand*

Thailand has not been spared and the mortality rate caused by traffic accidents in the kingdom was 44 per 100 000 population per year in 2010 which ranks second highest in world-wide road traffic deaths (Sivak & Schoettle, 2014). Namibia has the highest absolute number of recorded road traffic deaths, followed by Thailand and Iran (Sivak & Schoettle, 2014). According to the Thai Health Promotion Foundation (2008), from 1989 to 2007, the rate of road traffic crashes is ranked second among the top three leading causes of death in Thailand after cancer and heart disease. In 2011, a total of 14,033 deaths due to vehicle-related crashes in Thailand were reported, and more than 500,000 people suffered injuries from traffic crashes each year, with over 3,000 resulting in permanent disabilities (Bureau of Policy and Strategy Ministry of Health, 2013). The economic burden placed on the country as a result of traffic accidents, deaths, and injuries is estimated to be around 254,935 million Baht in both direct and indirect costs, accounting for approximately 2.36% of the country gross domestic product. The cost of road traffic deaths is estimated at 2.85 million Baht per person according to the Asian Development Bank (2004). The adverse economic impact of road traffic accidents on Thailand's economy and public health is confirmed in a study conducted by Luatthep and Tanaboriboon (2005). In their study, the researchers reported that road traffic crashes are one of the crucial health issues facing Thailand, with the country's healthcare services and economy bearing excessive burden from road traffic crashes.

In line with the World Health Organization's declaration that 2011-2020 be the decade of action for road safety, the Thai government announced a 10-year national policy to reduce the number of road traffic crashes and deaths to a minimum during this period (Bureau of Policy and Strategy Ministry of Health, 2013). The National Statistical Office Thailand (2010) conducted a survey of people aged 18 and over throughout the country and found that of the 50,272,371 subjects interviewed, 1,546,337 people reported that they had been involved in road traffic crashes. The study also revealed that 1,189,133 people were injured and 11,386 people lost a limb (National Statistical Office, 2011). These grim statistics corroborate the latest data from the Bureau of Policy and Strategy Ministry of Public Health (2013) which indicated that in 2011, the number of people who died from road traffic crashes amounted to 14,033. This staggering figure equates to an average of 38 deaths per day or 3 deaths every 2 hours. Over the last 10 years, 130,000 Thai people have died annually from road traffic crashes. More than a 500,000 have been seriously injured or disabled (Health Information System Development Office, 2013).

#### *The Australian Motives for Dangerous Driving Scale (MDDS) (Ho & Yong Gee, 2008)*

In a study conducted in Australia, Ho and Yong Gee (2008) identified a number of the motives/factors that influence young Australian males to engage in dangerous driving. Their study, which employed both qualitative and quantitative methodologies, culminated in the development of the *Motives for Dangerous Driving Scale* (MDDS). The qualitative part of the study involved the use of focus groups in

which the participants were asked to consider their own driving behavior and to list down as many reasons as they could think of as to why they would engage in high risk dangerous driving. These reasons were then content-analyzed and those reasons which were listed at least four times were retained. This procedure resulted in a final total of 54 reasons for dangerous driving. Forty representative statements were then written by the authors to be included in the MDDS.

The quantitative part of the study involved the use of exploratory factor analysis to identify the factor structure of the MDDS. Exploratory factor analysis of the 40 reasons for dangerous driving yielded three distinct motives for dangerous driving, namely: driving fast/risk-taking, confidence in one's driving skills, and disrespect for traffic laws. Test of construct validity (via confirmatory factor analysis) confirmed the 'fit' of this 3-factor model. Test of criterion-related validity showed that the three motives for dangerous driving were positively correlated with experiences with traffic accidents and traffic offences, as well as with the frequency of their occurrences.

The development of the MDDS points to its utility in identifying dangerous driving motives that can assist in the development of effective treatment strategies. However, it must be noted that the MDDS was developed in Australia based on samples of Australian male drivers. As such, its cross-cultural validity when applied to Thai male drivers is unknown. The present study was conducted to test the cross-cultural validity of the Australian Motives for Dangerous Driving Scale as applied within the Thai context.

## **Methodology**

### *Participants*

A total of 300 participants consisting of young Thai men from the Bangkok metropolitan area volunteered to fill the in the study's questionnaire. Their ages ranged from 18 to 28 years, with a mean age of 24.95 years. The participants held a current driver's license for an average of 4.7 years. The majority of the participants (80.6%) was employed at the time of the study, and had a mean income ranging from Baht 20,001 to Baht 40,000 per month.

### *Material*

Participants responded to a questionnaire consisting of five sections. Section 1 consisted of items written to elicit the participants' demographic information relating to their age, level of education, personal income, employment status, and how long they have held a driver's license.

Section 2 consisted of the 40-item Australian-developed Motives for Dangerous Driving Scale (MDDS) (Ho & Yong Gee, 2008). The items were to be rated on 6-point Likert scales from 1 (strongly disagree) to 6 (strongly agree), with high scores indicating strong endorsement of the driving motives.

Section 3 consisted of Zuckerman's (1994) Sensation Seeking Scale (SSS) (Form V). The 10-item scale required participants to rate each item on a 6-point Likert scale ranging from 1 (strongly disagree) to 6 (strongly agree). The 10 items, when summed together, provide an overall index of the sensation seeking trait, with high scores indicating high need for sensation seeking.

Section 4 consisted of the 18-item Danger Assessment Questionnaire (Franken, Gibson, & Rowland, 1992). This measurement tool measures the extent to which a variety of activities are considered to be dangerous. Each item was to be rated on a 6-point Likert scale from 1 (not at all dangerous) to 6 (very dangerous), with high scores indicating strong endorsement of that activity as being dangerous.

Section 5 consisted of two sets of questions which asked whether (1) the participant had been involved in any traffic accidents (regardless of whether or not he was responsible for the accident) while driving a car in the past two years, and if 'Yes', approximately how many accidents he had been involved in as a driver and (2) whether the participant had been charged or stopped by the police for any traffic offences in the past two years, and if 'Yes': (a) approximately how many traffic offences he had been charged or stopped by the police for, and (b) the type of traffic offences he had been charged or stopped by the police for, and their frequency in the past two years.

#### *Translation of Questionnaire into Thai*

As not all Thais read and write English proficiently, it was necessary to translate the original English version of the questionnaire into the local language. The questionnaire was translated into Thai and back-translated into English by two bilingual (English-Thai) experts in order to check for the consistency of meaning in the translated Thai version. These two bilingual experts were from the Faculty of Humanities at Chiang Mai University (CMU) and from the Faculty of Arts at Silpakorn University (SU). The two translators worked together and any inconsistencies between the 'forward translation' and 'back translation' were discussed within the Thai cultural context and resolved by the two translators.

#### *Pre-test*

A pretest of the questionnaire was conducted prior to the actual study to check for errors and for readability. Data were collected from a total of 30 participants (none of these participants participated in the main study). Upon verifying that the questionnaire was free from errors and comprehension problems, the researcher proceeded to conduct the actual study in the designated study locations.

#### *Procedure*

The distribution of questionnaires took place in various areas in Bangkok such as universities, business offices, shopping malls, and the Department of Land Transport Office, in order to obtain as diverse a sample as possible. Those who agreed to participate voluntarily were given the survey questionnaire to fill in. The purpose of the study was explained to the participants and they were also informed that (1) they could withdraw from filling in the questionnaire at any time, (2) no names would be recorded to guarantee anonymity, and (3) the data collected would only be used for the purpose of this study and only by the researcher and her advisor.

## Results

### *Exploratory Factor Analysis*

Participants' responses to the 40-item questionnaire were subjected to a principal components analysis, followed by oblique rotation. Inspection of the results revealed that 10 factors had eigen-values greater than 1.00. However, examination of the items that loaded on these 10 factors indicated that only three factors were interpretable, as well as containing the fewest number of cross-correlated items. In conjunction with results obtained from the scree-plot, these findings suggested a three factor solution. These three factors accounted for 24.08, 7.88, and 5.34% of the total variance respectively, for a combined total of 37.30%. Oblique rotation, limited to three factors was then conducted.

From the obtained pattern matrix, a total of 31 items were retained, using the criteria of selecting items with factor structure coefficients greater than or equal to 0.40 and no significant cross-correlations. The use of the 0.40 value as a criterion for selecting items is based on the logic that squaring the correlation coefficient ( $0.40^2$ ) yields approximately 16% of the variance explained (Hair, Anderson, Tatham, & Black, 1997). Of the 31 items, 16 correlated with Factor 1, nine correlated with Factor 2, and six correlated with Factor 3. Examination of the items that correlated with these three factors indicated that Factor 1 consisted of items that reflected a desire to drive fast and/or to take risks while driving (e.g., I get a thrill from driving fast.; I take out my frustrations by driving fast). Factor 2 consisted of items that reflected confidence in one's driving skills (e.g., I am a skilful driver and am always in control of my driving; my driving skills allow me to negotiate traffic hazards safely). Factor 3 comprised of items that reflected a negative attitude (disrespect) toward traffic laws (e.g., It is okay to drink and drive as long as I know I am in control of my car; When driving at night, it is okay to drive through red lights or stop signs as long as I am careful).

It should be noted that these three factors extracted from the Thai-based MDDS (representing three major motives for driving dangerously among young Thai male drivers) are highly similar to the three-factor structure identified for the Australian-based MDDS. Thus, it seems that for both Australian and Thai young male drivers, their driving habit is motivated primarily by the three major motives of 'driving fast/taking risk,' 'confidence in one's driving skills,' and 'disrespect for traffic laws.'

### *Reliability Analysis*

In order to maximize the internal consistency of the MDDS derived factor solution, the items representing each of the three factors were item analyzed. Two criteria were used to eliminate items from these factors. First, an item was eliminated if the inclusion of that item resulted in a substantial lowering of Cronbach's alpha (Walsh & Betz, 1985). Second, an item was considered to have an acceptable level of internal consistency if its corrected item-total (IT) correlation was equal to or greater than 0.33 (Hair, Anderson, Tatham, & Black, 1997). Table 1 presents the three-factor multidimensional Motives for Dangerous Driving Scale (MDDS), the Sensation Seeking Scale, and the Danger Assessment Questionnaire, together with their corrected item-total correlations and Cronbach's alphas.

**Table 1: Scale Items Together with Their Corrected Item-Total Correlations and Cronbach's Alphas**

Driving Fast/Taking Risk	Corrected Item-Total Correlations
• I get frustrated when I'm driving in heavy traffic.	.50
• I get annoyed when someone speeds up as I am trying to overtake.	.52
• I get annoyed at drivers who drive slowly in the right hand lane on motorways.	.54
• I often become impatient when I have a run of red lights.	.47
• Playing loud music in the car makes me drive faster.	.59
• I tend to drive fast so I can get to my destination sooner.	.57
• I get a thrill from driving fast.	.51
• I often sound my horn or make obscene gestures at other drivers if they cut in front of me.	.52
• I tend to drive faster when I am angry.	.56
• I like to drive close behind slower drivers.	.61
• I would rather drive a car that is powerful than one that is comfortable.	.58
• I often drive through traffic lights when the light is amber.	.52
• It is okay to violate traffic laws.	.53
• I take out my frustrations by driving fast.	.55
• Exceeding the speed limit by 10 km per hour is no big deal.	.51
• I often like to change lanes even in heavy traffic.	.53
Cronbach's alpha = 0.87	
Confidence in One's Driving Skills	Corrected Item-Total Correlations
• I feel I am in control when I'm driving.	.55
• I adjust my driving style according to the road conditions.	.43
• I am a skillful driver and am always in control of my driving.	.42
• My driving skills allow me to negotiate traffic hazards safely.	.50
• I often pay attention to other road users.	.38
• I react quickly when faced with unexpected traffic hazards.	.46
• I am fluent in changing lanes in heavy traffic.	.48
• It is highly unlikely that my driving will ever cause an accident.	.40
• I am able to judge accurately the speed of an oncoming car.	.46
Cronbach's alpha = 0.77	
Disrespect for Traffic Laws	Corrected Item-Total Correlations
• I like to "race" other cars at the traffic light.	.62
• When driving at night, it is okay to drive through red lights or stop signs as long as I am careful	.46

**Table 1: Scale Items Together with Their Corrected Item-Total Correlations and Cronbach's Alphas**

• Driving fast is one way of showing my friends that I am a skillful driver.	.45
• Driving fast calms me down.	
• It is okay to drink and drive as long as I know I am in control of my car.	.57
• I often pull out into on-coming traffic.	.51
Cronbach's alpha = 0.75	.34

Examination of the Cronbach's alphas for the three dangerous driving motives and their items' IT correlations showed that all items were acceptable based on the aforementioned two criteria. As such, all 31 items were retained to represent their respective factors. Each of the three driving factors/motives of 'driving fast/taking risk,' 'confidence in one's driving skills,' and 'disrespect for traffic laws,' together with the factors of 'sensation seeking,' and 'danger assessment' was then computed by summing across the items that make up that factor and their means calculated. Table 2 presents the means and standard deviations for the five computed factors.

**Table 2: Means And Standard Deviations for The Computed Factors of 'Driving Fast/Taking Risk,' 'Confidence in One's Driving Skills,' 'Disrespect for Traffic Laws,' 'Sensation Seeking,' and 'Danger Assessment'**

	Mean	S.D.	Mid-point
• Driving fast/taking risk	3.92	0.80	3.50
• Confidence in one's driving skills	4.08	0.62	3.50
• Disrespect for traffic laws	2.83	0.90	3.50
• Sensation seeking	3.10	0.71	3.50
• Danger assessment	3.40	1.05	3.50

As can be seen from Table 2, the driving motives of 'driving fast/taking risk' and 'confidence in one's driving skills' were rated above the mid-point on their respective scales, while the driving motive of 'disrespect for traffic laws' was rated below the mid-point on its scale. Thus, overall, the male Thai drivers in the present study reported that they were motivated to drive fast and to take risk, as well as possessing a high level of confidence in their driving skills. Surprisingly, they reported low disrespect for traffic laws. In terms of the participants' reported levels of sensation seeking and danger assessment, both these factors were rated below their respective mid-points. Thus, the study's Thai male drivers did not perceived themselves as high sensation seekers, and generally assessed many life situations as low in danger.

#### *Test of Convergent Validity*

To establish convergent validity, it is necessary to show that measures that should be related are in fact related. For example, the identified three dangerous driving motives of 'driving fast/taking risk,' 'confidence in one's driving skills,' and 'disrespect for

traffic laws,’ should theoretically be related to the attitudinal variables of ‘sensation seeking,’ and ‘danger assessment.’ That is, those male drivers who score high on the motives of ‘driving fast/taking risk,’ ‘confidence in one’s driving skills,’ and ‘disrespect for traffic laws,’ should also score high in ‘sensation seeking,’ and low in ‘danger assessment.’ To the extent that the significance and directions of these predicted relations are demonstrated, convergent validity is established. Pearson product-moment correlations were conducted between the three identified dangerous driving motives and the measures of sensation seeking and danger assessment. Table 3 presents the correlation coefficients between these constructs.

**Table 3: Correlations between The Dangerous Driving Motives of ‘Driving Fast/Taking Risk,’ ‘Confidence in One’s Driving Skills,’ and ‘Disrespect for Traffic Laws’ with The Attitudinal Variables of ‘Sensation Seeking’ and ‘Danger Assessment’**

	Sensation seeking	Danger assessment
• Driving fast/taking risk	0.49***	-.46***
• Confidence in one’s driving skills	0.16**	-.06
• Disrespect for traffic laws	0.62***	-.50***

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$

Examination of the correlation coefficients indicated that all three dangerous driving motives are significantly and positively related to the variable of sensation seeking. Thus, the more the male participants endorsed the dangerous driving motives of ‘driving fast/taking risk,’ ‘confidence in one’s driving skills,’ and ‘disrespect for traffic laws,’ the higher their reported need for sensation seeking. The results also indicated that the dangerous driving motives of ‘driving fast/taking risk’ and ‘disrespect for traffic laws’ are significantly and negatively related to the variable of danger assessment. Thus, the more the male participants endorsed the dangerous driving motives of ‘driving fast/taking risk’ and ‘disrespect for traffic laws,’ the lower their assessment of danger. The dangerous driving motive of ‘confidence in one’s driving skills’ was also found to be negatively related to the variable of danger assessment, although this relationship is not statistically significant. Overall, these findings indicate convergent validity for the MDDS.

#### *Test of Criterion-Related Validity*

Criterion-related validity is denoted by the degree of effectiveness with which the performance on the MDDS predicts performance in real life. Test of criterion-related validity for the MDDS was demonstrated by correlating the summated scales for the three identified dangerous driving motives of ‘driving fast/taking risk,’ ‘confidence in one’s driving skills,’ and ‘disrespect for traffic laws,’ with the participants’ reported (1) number of traffic accidents they were involved in the past two years and (2) number of traffic offences they were charged or stopped by the police within the past two years. It is hypothesized that the three identified dangerous driving motives will be positively correlated with the participants’ reported frequency of traffic accidents and traffic offences. Pearson’s product-moment correlation analysis was



conducted to investigate the direction and strength of the relationships between the three dangerous driving motives and the participants' reported number of traffic accidents and traffic offences experienced in the past two years. The results of this analysis are presented in Table 4.

**Table 4: Correlations between The Three Identified Dangerous Driving Motives of 'Driving Fast/Taking Risk,' 'Confidence in One's Driving Skills,' and 'Disrespect for Traffic Laws,' with The Number of Traffic Accidents and Traffic Offences Reported in The Last Two Years**

	Traffic accidents	Traffic offences
• Driving fast/taking risk	0.30***	.13*
• Confidence in one's driving skills	0.02	.19**
• Disrespect for traffic laws	0.28***	.13*

\*\*\*  $p < .001$ ; \*\*  $p < .01$ ; \*  $p < .05$

Examination of the correlation coefficients indicated that all three dangerous driving motives of 'driving fast/taking risk', 'confidence in one's driving skills,' and 'disrespect for traffic laws,' are correlated positively and significantly with the number of traffic offences reported in the last two years. Thus, the more the male participants endorsed the dangerous driving motives of 'driving fast/taking risk,' 'confidence in one's driving skills,' and 'disrespect for traffic laws', the higher the number of traffic offences they reported being charged or stopped by the police within the past two years. The results also indicated that the dangerous driving motives of 'driving fast/taking risk' and 'disrespect for traffic laws' are significantly and positively related to the number of traffic accidents the participants were involved in the past two year. Thus, the more the male participants endorsed the dangerous driving motives of 'driving fast/taking risk' and 'disrespect for traffic laws', the higher the number of traffic accidents the participants were involved in the past two year. Together, these findings indicate criterion-related validity for the MDDS.

## Discussion

The present study investigated the cross-cultural reliability and validity of the Motives for Dangerous Driving Scale (MDDS) as a multidimensional measurement tool that can tap into different motives underlying dangerous driving among young Thai male drivers. Exploratory factor analysis yielded a three-factor structure underlying the Thai-based MDDS. These three factors represent three major motives for dangerous driving among young Thai male drivers: 'driving fast/taking risk,' 'confidence in one's driving skills,' and 'disrespect for traffic laws. Reliability analysis indicated that the three motives for dangerous driving and their 31 representative items are internally consistent based on their computed Cronbach's alphas and their items' IT correlations. Tests of both convergent and criterion-related validity support the conclusion that the Thai-based MDDS is valid by these two criteria. Together, these findings support the cross-cultural validity of the Australian-developed Motives for Dangerous Driving Scale when applied to the Thai context.

In terms of the factors extracted from the Thai-based MDDS, it should be noted that the dangerous driving motives identified for Thai drivers are highly similar to those identified for the original Australian sample. Thus, it seems that regardless of culture, the motives to drive dangerously among young men are driven by the motives of driving fast/taking risk, confidence in one's driving skills, and disrespect for traffic laws. The only difference observed between the Australian and Thai samples is that the Thai young male drivers did not rate themselves as high sensation seekers with may denote a cultural difference reflecting the Thai 'easy going' attitude (*sabai sabai*, *mai pen rai*) as well as a feeling that life in general is not dangerous.

There seems to be a global consensus about male drivers in terms of their high-risk driving behaviour and accident rates which has long been recorded in the UK, Europe, Australia and the United States as well as in many other countries. Without exception, in all the studies carried out, male drivers have been shown to have high rates of road traffic accidents and high levels of sensation seeking with low danger perception (Evans, 1991; McKenna et al, 1998; Parker et al, 1995; Abdel-Aty & Abdelwahab, 2000; Waller et al 2001; Waylen & McKenna, 2002; & Lancaster & Ward, 2002). These characteristics are noted especially in the under-25 year category. There is also strong evidence to suggest that males are more likely to exceed speed limits as well as commit other road traffic offences than females (Storie 1977). According to Norrris et al. (2000), the greater tendencies among male drivers to be associated with traffic violations could be due to behavioural and situational risk factors, along with differences in character and a tendency to overestimate their driving abilities.

The major cultural difference between Australian and Thai young male drivers appears not to be in their driving motives but in their attitudes toward life adversities. 'Mai-pen-rai' in English means, 'it doesn't matter' or 'it's not a problem'. The expression reflects the attitude of Thai people towards themselves as well as the world around them and their daily contacts. In short, most things are acceptable to the Thai person. Unlike Australians, it is deemed normal to avoid conflicts and objections in Thailand. People in general endeavor to be tolerant and have a compromising attitude toward life adversities (Vongvipanon 2009).

### **Limitations of The Study**

Before discussing the implications of this study's findings, some limitations of this study must be noted. First, this study was conducted with a restrictive sample involving only young Thais in the capital and metropolitan city of Bangkok, Thailand. As such no comparative conclusions can be made between the driving motives of these Bangkok drivers with those of Thai rural drivers. In other words, given the life situations (e.g., extreme poverty) that characterize up-country living, the motives that motivate young male rural drivers to drive dangerously may be different from those identified for the Bangkok young male drivers. This suggestion is supported by the finding that the majorities of the participants (80.6%) were employed at the time of the study and had a mean income ranging from Baht 20,000 to Baht 40,000 per month. The higher education and income levels could have resulted in a decreased injury rate relative to the rural population. As such, the validity of the study's findings may be

questionable and caution should be taken when generalizing the findings from this study to young Thai male drivers in other areas in Thailand.

Second, it is impossible to obtain complete and accurate figures on road traffic accidents from statistical sources within the country. The main sources of road traffic collisions data come from different sources such as hospitals and the police department which unfortunately does not have a standardized recording system. The Traffic Engineering Division, Department of Highways covers only a quarter of national roads and primarily relies on police reports (Suriyawongpaisal & Kanchanasut, 2003). Worse of all, the accident data published by the Royal Thai Police and the Thai Department of Highways are not reliable as they are often under-reported. It should also be noted that statistics in Thailand only publish accidents where victims die at the scene of the accident unlike the WHO statistics which include data up to 30 days after the initial incident. Consequently, many fatalities, major and minor injuries have been missed from the data.

### **Implications**

With the above limitations in mind, the findings from the present study carry a number of important implications relative to the motivation of young Thai male drivers to drive dangerously. First, the finding that the Australian developed Thai-based Motives for Dangerous Driving Scale (MDDS) is both reliable and valid provides practitioners with a diagnostic tool for measuring the motives that underlie the decision of Thai young male drivers to drive dangerously. The Thai-based MDDS may also be used by government or non-government agencies that are involved in the 'Decade of Action for Road Safety in Thailand' to identify the high-risk driving motives among young Thai drivers, and to employ these findings to tailor intervention strategies aimed at lowering the road toll.

Second, the Thai-based multidimensional MDDS may be an important contribution to the understanding of the dynamics of risk-taking behaviors among young Thai male drivers. The identification, measurement and eventually, the understanding of the motives for high-risk driving may provide the basis for predicting high-risk drivers and to help develop tools and strategies to evaluate and to provide an appropriate response in tackling the problem. Driver training and safety programs could be developed having clearly understood the motives behind high-risk driving practices. Through the development of the Thai-based MDDS, researchers and program planners may be able to focus on specific motives for dangerous driving practices. The MDDS can clearly discriminate between motives for dangerous driving and therefore could be used as a predictive marker for identifying at risk individuals and thus allowing for the tailoring of intervention programs that incorporate these motives.

### **Conclusion**

The overall findings from the present study fit well with the growing body of evidence in the literature that support the idea of males as high risk takers, over-confident in their driving ability, and low in their danger perception, and as such represent the group that is most at risk of motor vehicle accidents. More than this, male drivers are particularly at risk due partly to the entire social system of norms and media-driven

images that equate masculinity with fast driving and performing difficult driving maneuvers (Berardelli, 2008). The cross validation of the Thai-based MDDS provides future researchers with an instrument that can act as a quick screening tool to evaluate the motives underlying the driving behaviors of young Thai male drivers. While the present study has been successful in identifying the high-risk driving motives that typify the driving behaviors of young Thai male drivers, continued research in this area is crucial if effective programs are to be developed that can effectively lower the high road fatality and injury rates of this group of drivers (Ho & Yong Gee, 2008).

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