

REPORT OF RESEARCH RESULTS

REPORT OF UTILISATION OF RESEARCH GRANT

1) INSTRUCTIONS FOR REPORT OF RESEARCH RESULTS

(a) Title	UNSAFE DRIVING DECISION OF ELDERLY DRIVERS การตัดสินใจที่ไม่ปลอดภัยของผู้ขับขี่สูงอายุ
(b) Primary Researcher : (Name, Affiliation) Co-researcher : (Name, Affiliation)	Sorawit Narupiti , Associate Professor Dr. Department of Civil Engineering Chulalongkorn University Chanida Intasien , master's student Department of Civil Engineering Chulalongkorn University Thana Pothanon , master's student Department of Civil Engineering Chulalongkorn University
(c) Aim of Research	1. To determine or find driving decision causing unsafe behaviors under different traffic situations (Focus on Elderly). 2. To find the relationship between unsafe driving behaviors with personal characteristics. 3. To compare those decision and relationships among drivers of three age groups.
(d) Summary: Include the outline and conclusions of the research	
<p>This research investigated the unsafe driving decision of three drivers' age groups in Bangkok (with focus on elderly drivers). The purposes of the study were to 1) explore the decision on maneuvering of drivers in three age groups, 2) find out the driving situations where the drivers have the most unsafe decision, and 3) compare decisions of drivers in the three age groups. The drivers were classified into three age groups; namely novice drivers (18-22), average drivers (23-64), and older drivers (65 up). The key driving scenarios were at merging, lane-changing, and right-turn at unsignalized intersection. The total of 667 drivers in Bangkok were interviewed. The data were analyzed using appropriate statistical methods.</p> <p>The results from the study indicate that, among three age groups, the average drivers (aged 23-55) have the least unsafe driving decisions at the three driving locations. This group of drivers generally has experience in driving and good health. The novice and older drivers have higher degree of unsafe decisions. The results conform to reports from the US that the novice and older drivers have high accident rates than the average drivers.</p> <p>Considering older drivers, they have the greatest unsafe decision (score) as they misjudge the driving situations at many driving scenarios. Many of their misjudged decision can lead to unsafe driving to him and to other drivers. In many cases, they choose to proceed in one traffic condition which may cause accidents. The older drivers have tendency to slow down at merging and lane changing situations. Although not statistically significant, the older drivers report that they experience muscle pain during driving. The most difficult driving situations are</p> <p>The results of the study give us insight on the driving behaviors and decisions. The trait of unsafe driving decision can help identify the weak decision by each age group. It is learned from the study that each group of drivers have different unsafe decision.</p>	

(e) Method of Research & Progression

The study adopted questionnaire survey from previous studies in US and Italy. A driver was asked to decide the action of maneuver at several driving scenarios. The action was interpreted as “unsafe” and “safe” decision. Moreover, the questionnaire gathered other information such as age, personal characteristics, health condition.

The sample in the study was the drivers in Bangkok. The subjects were non-randomly selected from volunteers. The interviewers were university students. Table 1 shows the number of samples in each age group.

Table 1 Number of samples in each age group

Sample	Novice		Average		Older	
	(person)	(%)	(person)	(%)	(person)	(%)
	168	24.7	404	62.2	95	13.1
Total	667					

The interview was conducted in 2013 and 2014. Then the data were analyzed using several statistical methods; descriptive statistical, correlation, regression, depending on the types of variables.

(f) Results of Research

The unsafe driving decision was revealed for all three age groups. Table 2 displays the overall unsafe decision scores by three age group drivers.

Scenario		No- vice	Ave- rage	Older	F	Sig.
Merging	\bar{x}	2.37	2.58	2.83		
	(%)	21.6	23.5	25.7	2.49	.084
	S.D	(1.57)	(1.56)	(1.63)		
Lane-changing	\bar{x} (%)	2.37	2.50	2.72		
	S.D	29.6	31.3	34.0	1.96	.141
		(1.38)	(1.38)	(1.51)		
Right-turn	\bar{x}	1.52	1.27	1.46		
	(%)	38.0	31.8	36.4	3.35	.036
	S.D	(1.26)	(1.01)	(1.20)		

Note: unsafe decision score is the total number of “incorrect” selection of action, which will lead to unsafe driving

Table 2 shows that the among the three age groups, the older drivers have the greatest degree of unsafe decision (score) at merging and lane changing situations, while the novice drivers have the greatest at right-turn situations.

Considering in detail on unsafe driving decisions at 11 merging situations, the study reveals how each group of drivers has unsafe decision at particular situations. The older drivers tend to slow down (brake) or maintain the speed even though that is unsafe to do. In contrast, the novice drivers tend to accelerate at merging. At lane-changing situations, three groups of drivers have similar tendency of unsafe driving decisions. The differences are not statistically significant. At the right-turning, the

novice drivers tend to proceed with acceleration. The older drivers misjudge one situation where the opposing vehicle is far away. The older drivers still tend to slow down or stop before proceed the turning.

An examination on the unsafe driving decision of the older drivers can be done. Figure 1 shows the merging situations in which the older drivers have the greatest unsafe decisions. Figure 2 shows the situation where novice drivers have the greatest degree of unsafe decision. The decisions are significantly different from the other two groups (at 0.1 significance)

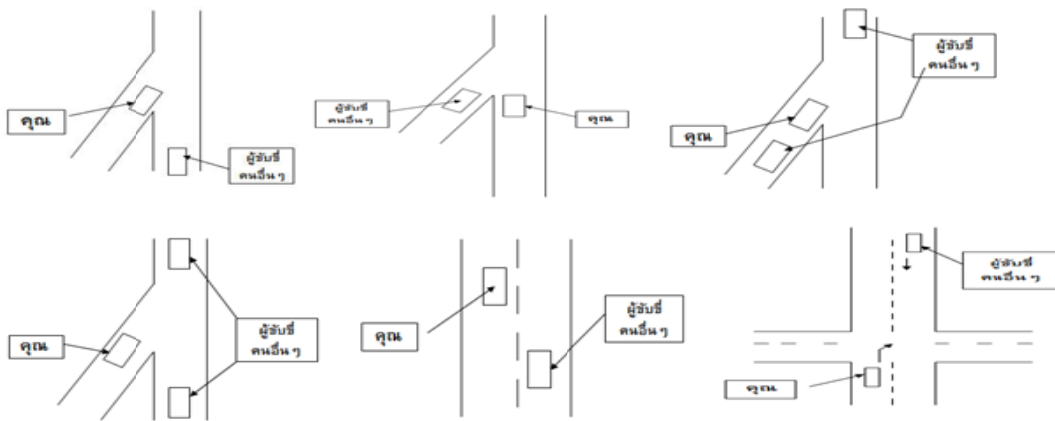


Figure 1 Situations that older drivers get the highest unsafe decisions.

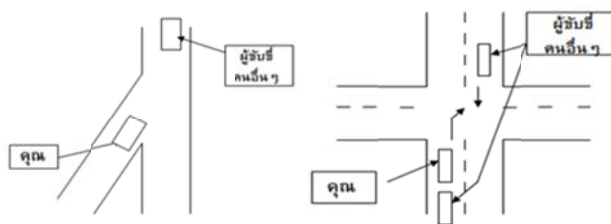


Figure 2 Situations that novice drivers get the highest unsafe decisions.

It is observed that these situations require bold decision. Some easy-task situations can be misjudged by the older and novice drivers.

The relationship between driving decision and other explanatory variables were investigated. At merging situations, the unsafe decision (score) is correlated with the preparation to enter the merging area, the use of rear mirror and the use of side mirror. At lane changing situations, the unsafe decision is correlated with the use of side mirror and the adjustment of the mirror before driving. At the right-turning situations, the unsafe decision is associated with the avoidance of right-turn at signalized intersection and the assessment of speed of opposing vehicle.

Medical records and health conditions can be attributed to the misjudged decision. However, in this study the correlation is not statistically significant.

(g) Future Areas to Take Note of, and Going Forward

The study discloses unsafe driving behaviors at the three key driving locations. At the merging and lane-changing location, the older drivers have the highest prone to unsafe-driving maneuvers. At the right turn location, the novice drivers have the greatest possibility of unsafe decision. The study reveals that each group of drivers still has own likelihood of unsafe driving decision. The unsafe decision is independent on the experience of driving. Thus, the driving education should be conducted for drivers of all age groups. The preventive driving education is another area that could be explored in the future research.

The content of driving instruction can be developed.

As drivers in all age groups can have unsafe driving decision, it is interesting to consider paper or road test for even experienced drivers. Similar to driver's license renew in other countries, a study should be conducted to see the benefits of having paper or road test at the time of driver's license renew.

To address the older drivers, this study discovers that the health condition of older drivers may be one of the attribute to unsafe decision. The relationship between health and driving maneuver should be studied in a more detail.

(h) Means of Official Announcement of Research Results

Intasien, C., and Narupiti, S. (2014) UNSAFE DRIVING DECISION OF THREE AGE GROUPS IN BANGKOK, *Proceedings of the 19th National Convention of Civil Engineering*, Khon Khan, Thailand.

Intasien, C., and Narupiti, S. (2014) Risky driving behaviors of three age groups in Bangkok, *Proceedings of the 7th Asian Transportation Research Society*, Bangkok, Thailand.