REPORT OF RESEARCH RESULTS

(a) **Title**: Modeling of parents' intention for using child safety seat: Confirmatory factor analysis approach.

(b) **Primary researchers**: Dr.Thanapong Champahom
Department of Management, Faculty of Business Administration
Rajamangala University of Technology Isan (Nakhon Ratchasima)

(c) **Summary**

Evaluated by the World Health Organization, road safety laws in Thailand are currently being implemented in line with international standards including the use of seat belt, helmet, and speed limit enforcement. However, child car safety seat legislation enforcement has not yet been implemented (World Health Organization, 2010). The estimate rate of child car safety seat use is only 1% which is possibly caused by its costly price. Furthermore, parents have not yet been aware of its importance. In order to increase the child safety seat use in cars, the parents' own attitudes potentially provide appropriate and effective policy guidelines. Therefore, this research aims to study the structural model established from the parents' attitudes towards the current child safety seat use. The significantly obtained outcome from this research for the society is the acquisition of policies increasing the use of child safety seats which potentially reduce the death rate and injuries in accidents

(d) **Aim of Research**

- To learn why most parents do not choose child safety seats
- To take the results from the study on the structural model showing the parents' attitudes when using a safety seat as a guideline to encourage people to turn to use child safety seats.

(e) **Method of Research and Progression**

Factor analysis consists of two methods, Exploratory factor analysis (EFA) and Confirmatory Factor Analysis (CFA). The methods used in this study are described as follows;

EFA

The objective is to describe the covariance among many variables in terms of a few unobserved factors. EFA based on a specific statistical model relies on the correlation matrix, so factor analysis is suitable for variables measured on interval and ratio scales. Actually, this research has obtained various indicators already confirmed by HBM, but the two indicators including promotion, and law enforcement were added, so EFA is used to regroup the indicators concerning the attitudes toward CRS use for a second time. Interpretation of factor analysis is straightforward. Variables with high factor loadings are thought to be highly influential in describing the factor, whereas variables with low factor loadings are less influential in describing the factor. Inspection of the variables with high factor loadings on a specific factor is used to uncover structure or commonality among the variables. One must then determine the underlying constructs that are common to variables that load highly on specific factors.

CFA

CFA enables us to test how well the measured variables represent the constructs. The key advantage is that the researcher can analytically test a conceptually grounded theory explaining how different measured items represent important psychological, sociological, or business measures. When CFA results are combined with construct validity tests, researchers can obtain a better understanding of the quality of their measures. Visual representation of a measurement of parents' attitude. either group of non-user parents and user parents.

Incremental Fit Indices

Root Mean Squared Error of Approximation (RMSEA), Computation of RMSEA is rather straightforward and provided here to demonstrate how statistics try to correct the problems of using the $\chi 2$ statistic alone where $\chi 2/df < 3$ and RMSEA < 0.06.

Standardized Root Mean Residual (SRMR) is the error in prediction for each covariance term creates a residual. SRMR is useful for comparing fit across models. A rule of thumb is that an SRMR over 1 suggests a problem with fit, although there are conditions that make the SRMR inappropriate that are discussed in a later section. Acceptance centurion of SRMR is < 0.08.

Comparative Fit Index (CFI). The CFI is an incremental fit index that is an improved version of the normed fit index (NFI) Because the CFI has many desirable properties, including its relative, but not complete, insensitivity to model complexity, it is among the most widely used indices. CFI values above .90 are usually associated with a model that fits well.

Tucker Lewis Index (TLI) varies in that it is actually a comparison of the normed chi-square values for the null and specified model, which to some degree takes into account model complexity. TLI is within acceptance range >0.9.

(f) Results of Research

Table 1 shows the question items, mean, and SD comparing between the two parent groups. Overall, the mean value of the question items went in the same direction. The mean of negative attitudes toward using CRS among CRS- User parents were mostly higher. It demonstrates perceived barriers in using CRS such as PBA1 and PBA2, etc. (average PBA1unuse=4.44, average PBA1use=4.31). The explanations are properly reasonable. Those who do not use CRS perceived barriers more than those who do. This may lead to the decision on not to use CRS. For the positive attitudes, both groups had alternating highs and lows. In other words, there is no difference between CR-User parents and CRS- Non user parents. Besides HBM, the added variables, Law Enforcement (LE1 and LE2) and Promotion (PRO1 and PRO2) were very similar. It can interpret that the attitudes toward the perception of law enforcement is not different. (average LE1,Unuse=4.07, averageLE1Use=4.04) as well as public and private promotion (average PRO1 Unuse=4.76, average PRO1 Use=4.78). It can interpret that both parents thought that public sector promotion of CRS use could drive motivations for CRS use.

The respondent characteristics in Table 2 divided parents into two groups as follows: 1) CRS Non-users referring to parents having the children use safety belts, and carrying small children (n=440), 2) and those who use CRS whenever they travel (n=360). Sample characteristics of two groups are relatively similar: for example, most of their education levels are bachelor's degree, most of their income is about 20k-30k per month, most of the commuters are parents, most of their occupations are private company employees, and most of the cars are four-door pickups and cars.

The CFA analysis results starting from the model suitability as shown in model fit indices (Table 3), found that both models were within the acceptable values. Overall, it shows that all indicators in the CRS- Non user parent group were significant, whereas in the CRS -User parent group, they were not all significant.

Table 1 Questionnaire Description

		Child Safety Seat			
		Non-user		User	
Code	Description	Mean	S.D	Mean	S.D
PB1	I think if using a child safety seat, it is not necessary to carry the child while in the car.	4.51	0.60	4.49	0.64
PB2	I think if using a child safety seat, it will be comfortable to take care of children in the car.	4.42	0.64	4.51	0.61
PC1	I think of a child behavior when sitting in a safety seat while traveling, such as a child sleeps comfortably.	4.17	0.80	4.22	0.79
PC2	I think while using a child safety seat, the parents will be confident while traveling.	4.42	0.72	4.39	0.73
PC3	I am sure that I can control my emotions while driving, and there will not be an accident, or the occurring accidents will not be seriously grave.	3.86	0.89	3.83	0.88
HM1	I think getting a road accident is the worst.	3.90	0.78	3.92	0.75
HM2	I think the health of my child/children is the most important.	3.93	0.75	3.89	0.77
HM3	I give great importance to my child/children's safety when driving.	3.82	0.82	3.83	0.81
SN1	If my parents ever used a child safety seat for me when I was young, I will use it for my children.	3.43	0.84	3.39	0.80
SN2	There are many families, friends, at my child /children's school, using child safety seats.	3.12	0.60	3.13	0.61
SN3	I am often praised or applauded for having my child/children sit in a child safety seat while traveling.	3.05	0.69	3.06	0.72
PSU1	I think a child safety seat is not needed when driving to nearby places.	2.83	0.70	2.74	0.68
PSU2	I have years of driving experiences; I can avoid accidents.	2.87	0.74	2.82	0.73
PSU3	I think a child safety seat is not quite important for experienced drivers.	2.73	0.71	2.70	0.75
PSEV1	In case of an accident where child/children is/are not in a safety seat, it will affect the feelings of people I know, such as parents, elder relatives, etc.	3.88	0.78	3.88	0.76
PSEV2	In case of an accident where child/children is/are not in a child safety seat, it may cause the deaths.	4.29	0.74	4.32	0.74
PSEV3	In case of an accident where child/children is/are not in a child safety seat, it may make my child/children and me become crippled, disable, and require long-term treatment.	4.40	0.71	4.38	0.70
PBA1	I think child safety seats are more expensive than their values or benefits they offer.	4.44	0.71	4.33	0.73
PBA2	I think a child safety seat in good quality is too costly for me to afford.	4.42	0.68	4.38	0.72
PBA3	Installing the safety seats in a car is a hassle for me.	3.86	1.07	3.90	0.98
LE1	If there are laws and random checks on the use of child safety seats during traveling, I will use them.	4.07	0.73	4.04	0.73
LE2	I think that if the country uses law enforcement, it will increase the proportional use of child safety seats.	4.02	0.74	4.01	0.71
PRO1	I think that the hospitals should provide child car seats for sale/rent/lend to the mother after giving birth.	4.46	0.67	4.47	0.70
PRO2	I think that the government should promote the use of child safety seats by supporting the purchases.	4.76	0.49	4.78	0.47

Table 2 Sample Characteristics

		CRS Use			
		Non-user		User	
Characteristic		Count	%	Count	%
Genger	Male	254	31.8%	171	21.4%
	Female	186	23.3%	189	23.6%
Average age (years)		36.18		35.88	
Average children age (years)		2.96		2.66	
Child relationship	Parent	300	37.5%	228	28.5%
	Relative	140	17.5%	132	16.5%
Education	Primary School	41	5.1%	30	3.8%
	Junior High School	65	8.1%	56	7.0%
	High School	65	8.1%	43	5.4%
	High Vocational	33	4.1%	22	2.8%
	Bachelor's degree	211	26.4%	196	24.5%
	Master's degree	16	2.0%	11	1.4%
	Doctoral degree	9	1.1%	2	0.3%
Occupation	Government Officer	10	1.3%	11	1.4%
	Private Sector	126	15.8%	113	14.1%
	Private Business	167	20.9%	121	15.1%
	Agriculturist	59	7.4%	57	7.1%
	Student	18	2.3%	19	2.4%
	General Employee	60	7.5%	39	4.9%
Salary (Bath per month)	10,001-20,000	11	1.4%	10	1.3%
	20,001-30,000	114	14.3%	94	11.8%
	30,001-40,000	71	8.9%	77	9.6%
	40,001-50,000	77	9.6%	60	7.5%
	50,001-60,000	63	7.9%	39	4.9%
	60,6001-70,000	58	7.3%	44	5.5%
	> 70,001	46	5.8%	36	4.5%
Urbanization	Urban	206	25.8%	103	12.9%
	Sub-urban	105	13.1%	145	18.1%
	Rural	129	16.1%	112	14.0%
Married Status	Married	204	25.5%	184	23.0%
	Others	236	29.5%	176	22.0%
Frequency of travelling with the child	Less than 1 time	141	17.6%	124	15.5%
	1-2 times per week	114	14.3%	97	12.1%
	3-5 times per week	64	8.0%	60	7.5%
	Every time of travelling	121	15.1%	79	9.9%
Vehicle type	Pickup	44	5.5%	32	4.0%
	Four- door pickup	144	18.0%	132	16.5%
	Car	143	17.9%	111	13.9%
	SUV	50	6.3%	33	4.1%
	Pick up Passenger Vehicle	59	7.4%	52	6.5%

Table 3 Confirmatory Factor Analysis Results

	Non-user		User	
Variable	Estimate	t-stat	Estimate	t-stat
Perceived Benefits				
PB1	0.441**	6.21	0.498**	5.64
PB2	0.542**	6.73	0.438**	5.25
Perceived Control				
PC1	0.786**	29.28	0.799**	30.06
PC2	0.621**	17.41	0.676**	19.72
PC3	0.773**	28.37	0.814**	31.78
Health motivation				
HM1	0.785**	34.21	0.692**	20.26
HM2	0.787**	34.24	0.709**	21.67
HM3	0.744**	29.14	0.729**	23.87
Social Norm				
SN1	0.503**	9.98	0.385**	6.81
SN2	0.486**	4.32	1.191**	5.01
SN3	0.559**	11.70	0.499**	11.23
Perceived Susceptibility				
PSU1	0.755**	6.30	1.212**	1.97
PSU2	0.152**	3.02	0.138	1.20
PSU3	0.183**	3.63	−0.045**	-0.99
Perceived Severity				
PSE1	0.548**	12.18	0.679**	17.26
PSE2	−0.530**	−11.60	−0.669**	-16.77
PSE3	−0.055	−1.07	0.159**	2.43
Perceived Barriers				
PBA1	0.614**	17.29	0.799**	2.67
PBA2	0.280**	5.93	−0.103	-1.62
PBA3	0.757**	22.79	0.768**	14.26
Law Enforcement				
LE1	0.541**	8.84	0.056	0.89
LE2	−0.356**	−6.79	0.416**	6.93
Promoting				
PRO1	0.522**	10.37	0.635**	12.97
PRO2	0.589**	11.41	0.634**	12.95

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

The utilization of the study is the organizations related to Child Restraint System (CRS) campaign, and the involved road safety agencies can propose the suggestions to policy recommendations. To lead to a reduction in the mortality rate of children aged 0-11 years from road accidents, the use of CRS should increase. The recommendations based on the research results are as follows; (considering the loadings and significant differences between the two-parent groups).

The increase in health motivation (highest loading factor) to help non-CRS adopters can be implemented by promoting child safety awareness, particularly when traveling [60]. This can be done by letting children sit in safety seats, and promoting a percentage of safety seats reducing the chances of children's death in road accidents. Another effective action approach for increasing motivation and subsequently changing behavior is community participation activity [61].

For law enforcement groups, they were different. Analysis has shown that using law enforcement increased the number of non-users turning to use seat belts. Moreover, Schaechter and Uhlhorn [27] have previously suggested that the combined effort of community awareness, education, equipment distribution, and law enforcement intervention that included incentives and warnings may be efficient to increase seat belt use.

For Promotion variable, it can be implemented in two directions: the hospitals should have public relations for use or rent and lend child safety seats at one's birth and afterwards. Regarding price, the government can manipulate the operation in three forms: while the government-subsidized price of child safety seats, there is a measure reducing income tax for those who use them in addition to the reduction in taxes charged on importing them from abroad. The mentioned measures are the ways to stimulate the dimension of CRS price as well [8].

(h) Means of Official Announcement of Research Results

We have already prepared our research to distribute our work to the wider audience in Transport Policy.