

FACTORS INFLUENCING INATTENTION-RIDING BEHAVIOR OF ADOLESCENT MOTORCYCLISTS IN MAHASARAKHAM PROVINCE, NORTH EASTERN REGION, THAILAND.

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ABSTRACT

A variety of subcultures and lifestyles have been built up around motorcycling with inappropriate behaviors in riding a motorcycle have led to a leading cause of injuries and deaths in several developing countries. Several investigations revealed the inattention riding is the main factor that leads to awareness reduction. This study aimed to examine the factors that influence inattention-riding behavior of adolescent motorcyclists in Mahasarakham province, Thailand using the theory of planned behavior (TPB) and extensions. A cross-sectional analytical survey was employed. Data were collected from 572 motorcyclists aged between 15 - 24 years old at two separate intervals about four months apart. The first collection was done to determine an intention- and inattention-riding behavior by self-administered questionnaires during December 2009 and January 2010, and the second collection was done to collect inattention-riding behavior by self-administered questionnaires in July 2010. Frequency, percentage, means, and standard deviations were used for descriptive statistics, Pearson product moment correlation coefficients, standard multiple regressions, and hierarchical multiple regressions were employed.

The significantly correlated psychological factors were included in the predict model. The best model resulted from standard multiple regressions could predict the intention-riding behavior toward inattention-riding behavior at 27.4 % - 39.9 % ($R^2 = 0.337$, adjusted $R^2 = 0.331$). The best factors appeared to be the perceived behavioral control of intention-riding behavior that accounted for 76.85 % of variance ($B = 0.225$, $\beta = 0.198$), while the social identity was accounted for 12.75 % of variance ($B = 0.341$, $\beta = 0.139$). The perceived behavioral control of inattention-riding behavior was accounted for 4.45 % ($B = 0.202$, $\beta = 0.119$), whereas the anticipated guilt was 3.26 % ($B = 0.217$, $\beta = 0.118$), and subjective norm was accounted for 2.37 % of variance ($B = 0.246$, $\beta = 0.152$). The hierarchical multiple regressions performed to analyze inattention-predicting model. The best model consisted of perceived behavioral control and past behavior could predict behavior by accounted

for 53.3 % - 63.6 % ($R^2 = 0.585$, adjusted $R^2 = 0.583$). The sensation seeking was added explanation for 56.4 % - 66.3 % ($R^2 = 0.614$, adjusted $R^2 = 0.612$, R^2 changes = 0.029) in model 2. And model 3 consisted of subjective norm and social identity, which could add explanation behavior for 58.0 % - 67.5 % ($R^2 = 0.628$, adjusted $R^2 = 0.625$, R^2 changes = 0.016). In summary, inattention riding was predicted by perceived behavioral control, past behavior, and some of intention, which meant inattention riding might be less volitional controls. However, intention was predicted by a set of perceived behavioral control, past behavior, and sensation seeking, and a set of subjective norm, and social identity. The mitigating inattention riding could indicate to perceived behavioral control, past behavior, sensation seeking personality, subjective norm, and social identity.

Keywords: Inattention-riding behavior, adolescent motorcyclists, theory of planned behavior.

INTRODUCTION

Motorcycle riding can be dangerous in the main meant of lane transport, and is a leading cause of injuries and deaths in several developing countries. The fatality and serious injury from motorcycle crashes worldwide have been found to be 20 times than driving (Haworth and Mulvihill, 2005). Motorcyclists are usually vulnerable to lane road users because motorcycling must use multiple tasks for vehicle control and maintaining than driving. It does not have covering protections, and rather inconspicuously (Hurt et al., 1981). Human behavior is usually related to crashes about 70% of all causes in road traffic accident (Peden et al., 2004). Moreover, motorcycle riding is very demanding multiple tasks, such as attending to location route, shape for road ahead, signs, signals, balance, state of vehicle, perception to road scenes, hazardous scenes, and all of changing on road (Gugerty, 2006). Thus, the awareness and attention of riders are necessary on road riding next from basic vehicle control skills and road rules. In real-time multitasking for driving, riding and flying, the term of consciousness, perceptual and cognitive processing, is probably maintaining these situations in the term of situation awareness (Leibowitz and Owen, 1977). The experienced drivers or riders used more cognitive recourses for hazard perception than less experienced. It has been suggested that hazard perception is a key process in situation awareness. It does not become automated with intensive experience, but instead remains a control process (Horswill and

McKenna, 2004). The main sub-tasks for vehicle control and road guidance are usually use ambient vision while driving or riding performance, but while they identify hazards they will use focal vision. The ambient vision allows them to perform the main sub-task for vehicle control well. However, when they are stimulated to interesting and perception for stimuli of rapidly occurred events, they must use focal vision (Leibowitz and Owen, 1977; Brooks et al., 2005). It has been shown that focal vision is phenomena of human mind's attention capture for conspicuous events in the environment, such as sudden movement. The focal vision can detect by direct stimulus and parallel with perception processes without the prior need. Then attention will shift following stimuli, and focal vision shift to capturing for stimuli, which lead to comprehension and consciously awareness to events (Yantis and Jonides, 1984). An attention is more important performance because in daily life about 90% of human perceptions occur by visual perception (Dewar et al., 2002). In real life growth are more complex learning and developing into life skills, and in perceiving something or voluntary recall something is demanded attention. An attention is very important in several aspects, i.e., serves the accurate goal, perception in speed driving, indicate to action, and well maintenance of information processing overtime (Parasuraman, 2000). Therefore, an attention is an importantly task of motorcycle riding. It was shown that an inattention driving was associated with three-fold increase of crash risk, and involved

road violations (Richardson and Marottoli, 2003). An attention itself is important process for allocation in a critical sub-skill in maintaining concentration, and when riding by inattention it rather decreases focal attention to detect hazards on road and increasing risks to crash. In other words, an attention or inattention is very important for human's perception, critical thinking and decision to human behavioral performance in almost all situations. Motorcycling or driving has delayed to recognizing of road riding information from inattention. Many stimuli can shift attention away from these riding tasks when riders face to some events, or do some activities, or look at other objects and contact persons within and outside vehicle. These activities which parallel perform with the riding tasks are called distractions (Treat, 1980). The NHTSA (2000) described four distinct separated types of driving distraction, i.e., visual, auditory, physical, and cognitive distraction. The visual distraction can occur from visual eye field blocked from objects, look for another targets while riding, and loss of visual attentiveness that they try to look but did not see. All of visual distractions interfere riding abilities to recognize hazard on road riding environment (Ito et al., 2001). Auditory distraction occurs when the drivers and riders focus their attention on sounds, or auditory signals rather than the road environment, such as listening to a radio or holding conversation with a carrying passenger. Physical distraction occurs when riders remove one or both hands from the handle bar, or steering wheel to physical manipulation of an object instead of focusing on the physical tasks, which required to riding or driving safely. And a cognitive distraction includes any thoughts absorb the driver's, or rider's attention to the point where they are unable to navigate through the road network safety, and their reaction time is reduced. The behavioral sources of riding distraction dominate for motorcycle riding interferes, such as eating or drinking while riding, mobile phone used by talking and listening, smoking related, talking with passenger (Stutts et al., 2001), and thinking of other issues except riding tasks.

An accident derived from motorcycling is the main cause of about 7,000 deaths, and about 80,000

cases in injury each year in Thailand (Thanaboriboon, 2006). The multiple-tasks for safety motorcycling depend on the awareness and riding attention of the motorcyclists. An unaware behavior is led to the main cause of crashes in Thai adolescent motorcyclists followed by an inattention-riding behavior. A pilot study was conducted by using focus group discussion and in-depth interviewing of 25 motorcyclists in Mahasarakham province, Thailand. It was suggested that the use of mobile phone in both of talking and hand held of the mobile phone while riding were the major factor contributed to the accident. Sometimes they talked with carrying passengers while driving the motorcycle (Armartpundit et al., 2009). We can observe these situations almost everywhere whenever we drive on road in Thailand. The nature of adolescent in Thailand usually does not deliberate to risk, and would like to take thrill seeking. They seem to show low level of understanding concerning the decision on the potential of risk outcomes, where their decisions were dependent on the riding skills and styles (Keating, 2007). They preferred to combine errors on level of immature safety riding skills and riding abilities, or violation from risk taking behaviors (Weinberger et al., 2005). Therefore, in order to understand the plausible mechanism of psychological mediating factors that may be relevant to or influence inattention behavior, the constructed Theory of Planned Behavior and extension was used to clarify the aimed of this study. We also would like to see how inattention-riding behaviors could be explained by the psychological mediating factors. The results from this study could be used to solve the problem in the future by designing interventions for implementation.

RESEARCH FRAMEWORK

Adolescent and brain system

The complexity of adolescent brain development has been translated at the beginning of childhood to an adult. Adolescent brain development is usually more complicated process (Keating, 2007). The frontal cortex (pre-frontal cortex and its links) is an important part of brain that is responsible for

mainly coordinating with other areas, and will fully develop in the third decade of life. Then the adolescent behavior could develop after the full brain's development. The responding for life skills, such as setting priorities, organizing plans, controlling emotions and impulses, allocating attention, inhibiting inappropriate behavior, and other maturity behaviors will develop after the brain functions become maturity (Weinberger et al., 2005).

Awareness and attention in riding ability

The riding road circumstance will change by riding scenarios whenever motorcycling is on the road. Hazardous events can occur in all of riding scenes such as accident. However, the perception and cognition of motorcyclists' abilities can help to detect dangerous scenes from human abilities of situation awareness and attention capture while riding. The maintaining processes of situation awareness in visual perception depend on rider's visual ability, attention capture, and allocation. The process of event comprehension and management, and responding depend on brain cognitive and load of experiences. Therefore, situation awareness is the ability of brain awareness to predict the rapid change of situations by corresponding with attention allocation. The multifaceted situations can be operated and used for guiding choices and action when engaged in real-time riding.

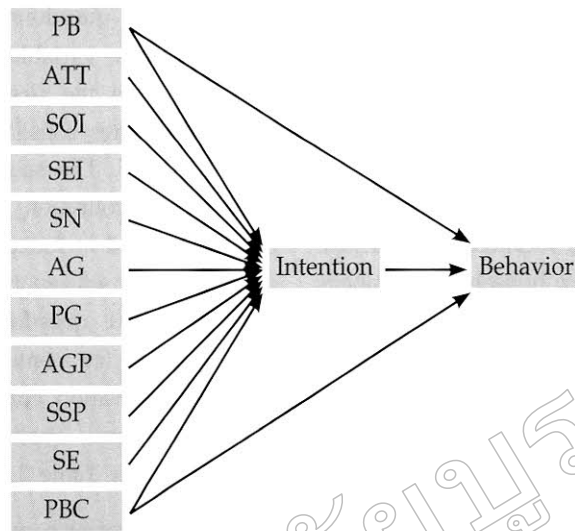
In order to understand the inattention-riding behavior and psychological related factors, the Theory of Planned Behavior (TPB) described by Ajzen (1991) is used to examine the relationship among selected reasons. The TPB is widely used in different kinds of behavioral researches, and provides the parsimonious model with well-defined constructs and pathways to explain in various behaviors. The TPB variables are formulated and aimed to take account of human behaviors by Social Cognitive Model (SCM). The antecedents of human behaviors are backgrounds from behavioral beliefs, normative belief, and control beliefs. The TPB variables based on Meta analysis could explain behavior and intention toward behavior, which accounted for 27 % and 33 % of variance, respectively (Amitage and Conner, 2001).

However, the TPB had been applied in different kinds of road user intention and behavior with the impact of TPB that constructs to those behaviors were accounted for attitude 15%, subjective norm 23 %, perceived behavioral control 32 %, whereas in previous studies of road user's behavior were additionally explained by anticipated regret 18 %, moral norm 16%, and self identity 20% (Ulleburg and Vaa, 2009). In addition to the explanation of TPB and prior extension by past behavior, it was shown that the past behavior was the behavior that was usually repeated performance under both of volitional and un-volitional control, might be related to human performs behavior by habitual practices. Conner and Amitage (1998) analyzed the role of past behavior in additional TPB model and found past behavior was directly related to intention and behaviors by explanation for 7.2 % and 13 % of variances, respectively. Therefore, those aforementioned variables were added into explanation intentional and behavioral model as extension of TPB to explain the intention and actual target behavior. Finally, the TPB and extension could be compatible with the sense of how people decide to engage health behavior, and expect to help organizing and expanding perspective health behaviors. It could be subsequently helped to observe the pattern of factors which might be associated with, and the findings could be guided to design interventions for improving the behavior and promote healthy and safety behavior.

MATERIALS AND METHODS

Instrument

Maharakham province, located in the north-eastern region of Thailand, was selected as study site, which is consisted of 13 districts (133 sub-districts). The study area is located in the central part of north-eastern area of Thailand. At the time of the study, most of the educational institutions were located in the city with the very complicated road traffic system and several means of transportation. Based on the annual report of road traffic accidents, more than 39 cases-deaths were contributed by motorcycle accident (Office of Transportation and Traffic



Behavior: inattention-riding behavior at month 4 after completing intentional questionnaires; **Intention:** intention to perform inattention-riding behavior; **PBC:** perceived behavioral control; **ATT:** attitude toward intention to inattention-riding behavior; **SN:** subjective norm; **PB:** past behavior; **SE:** self efficacy; **AGP:** aggressive riding personality; **SSP:** sensation seeking personality; **AG:** anticipate guilt; **PG:** past guilt; **SEI:** self identity; **SOI:** social identity; → refers to causal influencing.

Figure 1. Schematic diagram shows variables influencing inattention-riding behavior at month 4 after completing intentional questionnaires and variables influencing intention to inattention-riding behavior.

Policy and Planning, 2007). It was shown from qualitative study that adolescent motorcyclists were the main contributors. The behaviors that led to the accident were inattention-riding, which including of using cell phone while riding, talking to passenger, and riding without mirrors. Those of inattention behaviors had been mentioned as the main meant of motorcycle crash risk next from unawareness riding (Armarpundit et al., 2009). Therefore, adolescent motorcyclists in the selected areas were the target participants in this study. The inclusive criteria of samples were motorcycle-riding abilities, holding or not holding for Thailand motorcycle riding's license, not disabled, normal psychologies, and use Thai language as the main language. Participants that fall out of the afore-mentioned criteria were excluded from the study. The sample size was calculated for accuracy parameter estimation following the method described by Kelley and Maxwell (2003) by basing on the prediction of self-report on inattention-riding

behavior at four months later (after completing intention predicting version), and multiplied by design effect (design effect=2), by which the sample size was 572. Investigators added 10 % of samples for the reservation of subject-losing and uncompleted returning questionnaires. The total samples were 632 motorcyclists.

The study design was a prospective study. The collection of data in the first period (December 2009 to February 2010) was done by using a set of the constructed self-report questionnaires that consisted of criteria concerning of socio-economic characteristics, and TPB and extensions, which consisted of 13 parts. The collection of data in the second period (during July 2010) was done by using a set of self-report questionnaires that aimed to determine inattention motorcycling behaviors, such as riding with mobile phone use or talking while motorcycling, talking with their carry pillion passengers, always eye focus on road side, eye focus

on their vehicles, and thinking of other issues, except motorcycling tasks. The Ethics Committee of Human Research, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand approved this study.

The constructed first set instrument was consisted of several variable measures, i.e., socio-economic data including ages, location, sex, marriage status, education, number of household members, household income, type of license permit, riding experience, training experience, riding frequency, length time of riding per time, engine capacity, gear type, and motorcycle accidental experienced. These afore-mentioned variables were applied in

part 1 of the questionnaires. Concerning the TPB and extension variables measures that used to collect data in the first period, the criteria used in questionnaires consisted of four parts, i.e., parts 2, 3, 4, and 5. The second set of instrument that used in the collection in the second period was constructed and included all measures that aimed at determining of self-report inattention-riding behavior. The self-report questionnaires were assessed by three experts for contents validity and obtained internal observation corresponding index for 0.78. The details and qualities of questionnaires are summarized in Table 1.

Table 1. Descriptive details and qualities questionnaires of variable measures in the study.

Variables	Rate, and point scale range	Numbers of items	Cronbach's alpha coefficient
1st period of collection			
Intention (Int) toward inattention-riding behavior	1-7, 1 = strongly disagree 7 = strongly agree	6	0.81
TPB and extension			
TPB toward intention to inattention-riding behavior			
Attitude (ATT)	1-7, 1 = strongly disagree 7 = strongly agree	5	0.74
Subjective norm (SN)	1-7, 1 = should not 7 = should do	3	0.75
Perceived behavioral control (PBC)	1-7, 1 = strongly disagree 7 = strongly agree	5	0.75
Perceived self-efficacy (PBC-SE)			
Controllability (PBC-CA)	1-7, 1 = strongly disagree 7 = strongly agree	5	0.78
Extensions toward intention to inattention-riding behavior			
Self identity (SEI)	1-7, 1 = strongly disagree 7 = strongly agree	2	0.74
Social identity (SOI)	1-7, 1 = strongly disagree 7 = strongly agree	2	0.75
Self efficacy (SE)	1-7, 1 = strongly disagree 7 = strongly agree	6	0.85
Aggressive personality (AGP)	1-7, 1 = never, 7 = always	9	0.82
Sensation seeking personality (B)	1-7, 1 = never, 7 = always	6	0.78
Past guilt (PG)	1-7, 1 = strongly disagree 7 = strongly agree	4	0.76
Anticipated guilt (AG)	1-7, 1 = strongly disagree 7 = strongly agree	4	0.80
Past behavior (PB)	1-7, 1 = strongly disagree 7 = strongly agree	6	0.82
2nd period of collection			
Inattention-riding behavior (Beh) byself-report	1-7, 1 = never, 7 = always	6	-

The first set instrument was self-report questionnaires and allowed the participants to complete it within one hour. The second set instrument was also self-report questionnaires but the time allowed to complete the instrument was only 30 minutes. The collection of data in the second set of instrument was done four months later. Qualified research assistants were asked to fulfill the completion of the questionnaires of all versions. The data were compiled and crosschecked by both researcher and research assistants.

STATISTIC ANALYSIS

The data analysis was performed by using statistical analytic package program. Results of assumptions' evaluation were tested for normal distribution by Kolmogorov-Smirnov statistics, which yielded values greater than 0.5. The number of outliers, and multi-co-linearity analyzed by Tolerance value was greater than 0.20, whereas the values of VIF were less than 4 (Garson, 2008), with homoscedasticity of residuals. All of the data sets were normal distribution with none of them was multi-co-linearity between sets of independent variables, and was subsequently conducted with regression analysis processes. Descriptive statistics of frequency, percentage, mean, and standard deviation were used for general demographic characteristics and all of variables. Analytical statistics for analyzing the correlation between variables were carried out by using Pearson product moment correlation coefficient. The standard multiple regressions were used to assess how well the TPB that constructed to predict adolescent motorcyclists intention to perform inattention-riding behavior. Hierarchical multiple regression (HMR) analysis was used to predict ability of the constructed TPB and extension in relation to perform inattention-riding behavior. HMR was used to allow the control over the order in which TPB and extension variables were entered into the regression models.

RESULTS

A total of 572 participants were requested to complete self-report questionnaires in the first set

instrument to determine the intention and related factors. The collection of the second set instrument was done four months later. The self-report questionnaires of those two sets of the constructed instruments were obtained only 91 % of the total sample.

Table 2. Descriptive variables in the conceptual framework of the study (n= 572).

Variables	Mean	SD
The constructed TPB		
Inattention-riding behaviors at months 4 (Beh)	20.20	0.19
Intention to inattention (Int)	19.48	0.23
Perceived behavioral control to inattention-riding (PBC)		
Control believe (CB)	16.47	0.13
Perceived power (PW)	24.37	0.19
Attitude to inattention (ATT)	1.10	0.21
Behavioral believe (BB)	16.27	0.13
Evaluate outcome (EB)	13.19	0.09
Subjective norm (SN)	-0.18	0.14
Normative belief	11.61	0.14
Motivation to comply	-0.34	0.11
7.72	0.09	
Extended parts of TPB		
Self-efficacy (SE)	8.33	0.07
Self-identity (SEI)	7.64	0.07
Social identity (SOI)	7.42	0.90
Past guilt (PG)	20.59	0.15
Anticipated guilt (AG)	16.43	0.12
Aggressive personality (AGP)	37.38	0.26
Sensation seeking (SSP)	24.70	0.20
Past behavior (PB)	20.59	0.15

Socio-demographic characteristics of adolescent motorcyclists were consisted of 52.0 % male, 48.0 % female, with the mean of age was 20.5 years-old (SD= 0.13). The status of the participant was 73.1 % single, 35.8 % living in rural area, and the majority of them was students that contributed for 52.1 %. The participants who did not hold driving licenses issued in Thailand were 62.6 %. It was found that 99.1 % of the riding abilities of motorcyclists were

either trained by friend, or household members, or by themselves, where they contributed to accidental experiences for 49.8 %. The mean values of time that the participants had experiences in riding were 5.61 years (SD 0.11), where 9.1 % contributed to everyday riding. It was found that 97.9 % of them spent the time for riding more than 30 minutes per riding activity. Concerning the engine capacities of the motorcycle that participants used, about 58.3 % of the engine capacities of motorcycles were less than 110 cc, where 76.6 % of motorcycles were the automatic gear system motorcycles.

Results of analysis of data collected at the first period showed that the mean value of intentional toward inattention-riding was 19.48 (SD=0.23), where the mean value of perceived behavioral control was 16.47 (SD=0.13), and of the past behavior was 20.59 (SD=0.15). The mean value of an inattention behavior of the second set of data taken four months later was 20.20 (SD=0.19). Results are summarized in Table 2.

The bivariate analysis among selected variables described in the conceptual framework was found

to be significant correlation between the value of an inattention-riding behavior and the value of an intention toward an inattention behavior, with $r = 0.42$ at $p < 0.05$. The correlation between the value of inattention-riding behavior and of past behavior was significant, with $r = 0.67$ at $p < 0.05$, where the correlation between the score of inattention-riding behavior and the score of perceived behavioral control was also significant, with $r = 0.70$ at $p < 0.05$. The bivariate analysis among selected independent variables demonstrated a significant correlation between the score of intention toward inattention-riding behavior and the score of perceived behavioral control, with $r = 0.46$ at $p < 0.05$, where the score of intention and of past behavior was significant, with $r = 0.42$ at $p < 0.05$, as well as the correlation among the score of perceived behavioral control and of past behavior, with $r = 0.66$ at $p < 0.05$. Other correlation coefficients of selected variables described in the construction of TPB and extensions are displayed by matrix and summarized in Table 3.

Table 3. Bivariate correlation among the total score of constructed TPB and results of the inattention-riding behaviors score (n=572).

Beh												
Int	0.42*	int										
PBC	0.70*	0.46*	PBC									
ATT	0.65*	0.41*	0.64*	ATT								
SN	0.65*	0.49*	0.70*	0.66*	SN							
PB	0.67*	0.42*	0.66*	0.56*	0.58*	PB						
SE	0.61*	0.36*	0.55*	0.52*	0.64*	0.27*	SE					
AGP	0.67*	0.44*	0.66*	0.57*	0.64*	0.66*	0.52*	AGP				
SSP	0.64*	0.49*	0.64*	0.57*	0.69*	0.60*	0.60*	0.71*	SSP			
AG	0.24*	0.29*	0.28*	0.33*	0.24*	0.29*	0.27*	0.36*	0.36*	AG		
PG	0.63*	0.37*	0.58*	0.49*	0.57*	0.56*	0.55*	0.59*	0.59*	0.36*	PG	
SEI	0.61*	0.37*	0.63*	0.54*	0.67*	0.53*	0.55*	0.55*	0.59*	0.19*	0.54*	SEI
SOI	0.62*	0.46*	0.62*	0.60*	0.71*	0.56*	0.55*	0.61*	0.60*	0.28*	0.56*	0.64*

Beh: inattention-riding behavior at month 4 after completing intentional questionnaires; Int: intention to perform inattention-riding behavior; PBC: perceived behavioral control; ATT: attitude toward intention to inattention-riding behavior; SN: subjective norm; PB: past behavior; SE: self-efficacy; AGP: aggressive riding personality; SSP: sensation seeking personality; AG: anticipated guilt; PG: past guilt; SEI: self-identity; SOI: social identity.

* $p < 0.05$

Standard multiple regressions were used to examine the relation between intentions and inattention of adolescent motorcycling behavior, and the constructed

TPB and extension variables are shown in the theoretical structure in conceptual framework. The final model is summarized in Table 4.

Table 4. The final regression coefficient in predicted intention to inattention-riding model (n=572).

Variable	Coefficient		R ²	Adjusted R ²	Sr ²	t	Sig. level
	B	β					
SSP	.225	.198	.260	.259	0.010	3.70	0.001**
SOI	.341	.139	.303	.301	0.054	2.59	0.011*
PBC	.202	.119	.318	.315	0.003	2.13	0.030*
AG	.217	.118	.329	.324	0.074	3.13	0.001**
SN	.246	.152	.337	.331	0.004	2.75	0.001**

*P-value < 0.05, **P-value < 0.001

Results of analyzing processes shown in Table 4 display the correlation between several variables, i.e., the un-standardized regression coefficients (B), standardized coefficients (β), the semi-partial correlation (Sr²), R², and adjusted R². The regression value (R) of full model was significantly different from zero. The selected variables used in the model could predict the intention toward inattention-riding behavior, which fell between 26.0 % and 33.1 % (R² = 0.260 - 0.331). At the end of standard multiple regression, the R² and adjusted R² of the best model were significantly different from zero (R² = 0.337, with 95 % confident interval limits from 0.274 - 0.399, the adjusted R² = 0.331, with F = 57.23, and p < 0.001). The R² value of 0.337 indicated that the intention to inattention-riding behavior was predicted by the best model, which fell between 27.4 % and 39.9 %. The seeking of sensational personality was the best predictor in

the model and it could predict the intention to inattention-riding of adolescent motorcyclist, which accounted for 76.85 % of variances, whereas the social identity toward an intention was accounted for 12.75 %. The perceived behavioral control toward an intention was accounted for 4.45 %. The anticipated guilt was accounted for 3.26%, where the subjective norm toward an intention was accounted for 2.37 %.

In order to find the suitable steps of an inattention-riding behavior explanation, the hierarchical multiple regressions (HMR) were used to examine the relation between variables of the constructed TPB and extension variables following theoretical structure in conceptual framework, and an inattention-riding behavior of adolescent motorcyclists. The final model was developed and is summarized in Table 5.

Table 5. The hierarchical regression coefficient in the predicted model of an inattention riding behavior at month 4 later (n=572).

Step of analysis	Variables	Coefficient		R ²	R ² adj.	Sr ²	R ² changes
		B	β				
Step 1	PBC	0.399	0.278	0.585	0.583	0.029	0.585
	PB	0.332	0.269			0.034	
Step 2	SSP	0.157	0.164	0.614	0.612	0.011	0.029**
Step 3	SN	0.174	0.127	0.628	0.625	0.005	0.016**
	SOI	0.187	0.090			0.003	

*P-value < 0.05, **P-value < 0.001

Results of analyzing processes are summarized in Table 5. It was found that the un-standardized regression coefficients (B) and standardized coefficients (β), R^2 , adjusted R^2 , the semi-partial correlation (Sr_i^2), and R^2 were changed, where the R for regression of each full model was significant from zero. Although all three models were significantly predicted inattention-riding behaviors of adolescent motorcyclists, but there was a considerable variability among those of selected variances. It was found that the model could identify behavior ranging from 58.5 % - 62.8 %. The combination of the standard TPB variables and past behavior in model 1 was statistically significant from zero when the prediction of an inattention-riding behavior was taken into a consideration. The model could predict behavior between 53.3 % and 63.6 % ($R^2 = 0.585$ with 95 % confident interval limits from 0.533 - 0.636, adjusted $R^2 = 0.583$, $F = 399.83$, $p < 0.001$). The seeking of sensational personality and anticipated guilt behaviors were added in step 2. At the end of regression period, the values of R^2 and adjusted R^2 of model 2 were significantly different from zero ($R^2 = 0.614$, with 95 % confident interval limits from 0.564 - 0.663, adjusted $R^2 = 0.612$, $F = 300.74$, $p < 0.001$). The value of R^2 was 0.614 indicating that the seeking of a sensational personality could predict an inattention-riding behavior by the best model ranging from 56.4 % - 66.3 %. However, there was no statistically significant of anticipated guilt behavior when it was added to the prediction in model 2 (p-value was 0.845), whereas the value of R^2 changes was 0.029. The subjective norm and social identity were added into model 3. It was found that the values of R^2 and adjusted R^2 were significantly different from zero ($R^2 = 0.628$, with 95% confident interval limits from 0.580 - 0.695, adjusted $R^2 = 0.625$, $F = 191.1$, $p < 0.001$) at the end of regression. The value of R^2 was 0.628 indicating that the social identity and personal normative perception could be used to predict an inattention-riding behavior by the best model ranging from 58.0 % - 67.5 %, and the value of R^2 changes was increased from model 3 for 0.014 (2.208 %).

DISCUSSION

Inattention-riding behavior occurs from riders' distraction. It has reduced effectiveness of awareness riding behavior in the terms of hazard perception, for example, lane positioning, maintaining safe gaps, maintaining speed, decreasing hazard response in time to responding, inconsistency and in effectiveness. The results from this study revealed performing inattention-riding behavior of samples at month 4 about 47.1- 49.0%, and intention to this behavior about 45.3 - 47.4 %. However, the aim of this study was to examine the efficacy of theory of planned behavior and extensions to predict inattention-riding behavior. From the data analysis, it was found that inattention-riding behaviors could be predicted by perceived behavioral control, past behaviors and intention, and accounted for 58.0 % - 69.5%. The strongest predictor was perceived behavioral control to inattention-riding behaviors. It was shown that several behaviors were related to those of previous studies, such as speed driving behavior (Elliot et al., 2003), healthy dietary behavior (Waleekhachonlert, 2007), and past behavior, which was found to be the next predictor of behaviors. Past behavior was proposed by Triandis (1980) who stated that intention was not the sole predictor of behavior, but it was supplemented by habit and facilitating conditions, and that it was related to previous studies which used habit or past behavior for the explanation of actual driving related behavior (Elliot et al., 2003; Fleiter et al., 2007; DePelsmacker and Janssens, 2007). An intention of actual inattention-riding behavior was the weakest predictor that might be found the less predicts effect of significant variables in intention predicted model which was used to explain the hierarchical multiple regression of inattention behavior. This finding was related to the study of speed actual behavior (Elliot et al., 2003) and of a qualitative exploring risky motorcyclist's behavior (Armartpundit et al., 2009; Watson et al., 2007). Sometimes, all of human actual performing behaviors should not be under completed volitional control. In contrary, intention is under volitional control, where the mere information of intention is sufficient to predict

behavior (Amitage and Conner, 2001). Intentions are seen to be a stronger predictor than perceived behavioral control when some behaviors are socially desirable (Ajzen, 1991; Amitage and Conner, 2001).

Although, intention is the weakest factor for predicting actual inattention behavior, but intention is proximal outcome in the theory of planned behavior according to the conceptual framework. Several items were selected as behavioral factors for the prediction, i.e., attitude, subjective norm, and perceived behavioral control, but the psychological factors of human related behavior were influenced by more complex factors. In this study, we are looking for any result that will probably emerge from an analysis with extension parts to intention predicting model. The results from the analysis showed that the intention to inattention-motorcycle-riding behavior was explained by 26.5-39.5% of variance, whereas attitude was not significant for the predicted intention, and was different from those results found in several studies, i.e., a study on driver-speeding in Europe (Vogal, 1984; Newnam et al., 2004), a study on risky motorcycling in Australia (Watson et al., 2007), and studies in other health problems especially in dietary control (Waleekhachonlert, 2007). Therefore, attitude is a constructed hypothesis that represents an individual's degree of like or dislike for items. It is an individual's views, which are followed by other attitudes, i.e., judgments and development on affect, behavior, and cognition. The cognitive response is a cognitive evaluation of the entity that constitutes individual beliefs. Most of attitudes are the results of either direct experience, or observational learning from the environment. For motorcycle-riding skills of adolescent motorcyclists in Thailand, they usually lack of safety motorcycling skills training. Their friends and parents usually served as their trainers. Therefore, the requirement for motorcycle driving license among adolescent must include basic riding skills and knowledge in safety traffic laws. At present, the psychological riding safety model in Thailand does not include either in rider training curriculum or others. The consequence that causes of less induces to encourage safety attitude in Thai adolescent motorcyclists. The seeking of sensational

personality is the strongest behavior that can predict an intention of actual behavior. This behavior appears to be relevant to driver speeding behavior (Fernandes and Hatfield, 2006). There is a trait-describing tendency to seek new, different, and intense behaviors of sensation and experiences (Zuckerman, 1994), for example, the feeling of engaging risky behavior (Fernandes and Hatfield, 2006), and cell phone use while riding. Subjective norms that are influenced by family and significant factors were the first factor that added as predictor in the intention model. It was found that results were related to those reported in previous studies, i.e., study on some risky motorcycle riding in Australia (Watson et al., 2007); study on speed driving behavior (Parker et al., 1992), and other healthy behavioral studies (Waleekhachonlert, 2007). However, it was found that the subjective norms were significantly different from these behaviors. Thai adolescent motorcyclists are usually influenced by their friends. They like to engage in risky behavior to mimic their friends' behaviors. They always use cell phone while riding that we can observe almost everywhere on roads in Thailand. It was demonstrated that the guilt contributed for approximately 1.0 % of variance in the model. The anticipated guilt was shown to be a significant predictor of intention, and it was related to results described in previous study on physical activity (Wang, 2006; Abraham and Sheeran, 2004). Therefore, individuals were forced to anticipate by stronger guilt feeling, which was not related to past behavior. However, the anticipated guilt is more likely to be affected by stronger intention to perform this behavior in the near future. Social identity was accounted for 1.0 % of variance in the explanation of an intentional behavior. Social identity had been focusing on similarities of in-group identity. It was used to compare with out-group, and was also used for investigating individual identity when compared to counter-role within their group (Tajfel and Turner, 1986), which was likely to perceive normative belief of their group. It was shown that results were related to those reported in the study in Australia (Newnam et al., 2004). The last intentional behavior that could be used

as a predictor was perceived behavioral control. It could explain this intention with 1.0 % of variance, which was related to results reported in the study on driving related behavioral intention (Newnam et al., 2004; Fernandes and Hatfield, 2006), and in the study on motorcycle riders' behavior (Watson et al., 2007). However, the magnitude of perceived behavioral control and intention relationship are depended upon the type of behavior and nature of situation. It has been shown that the situations of subjective norm are powerful, whereas the perceived behavioral control may be less predictive for the intentions (Ajzen, 1991; Amitage and Conner, 2001).

In order to solve the problem of the inappropriate motorcycle-riding behaviors and road traffic accident among adolescent in Thailand, all of road traffic accident's stake-holders should pay more attention to the perceived behavioral control, especially the way to increasing perceived power and control belief for this behavior. Moreover, practitioners should be encouraged to use the intervene programs to correct the past behaviors, and habits, such as encouraging motorcyclists to take part in training programs. This may be done by adding in the objective of the training that it will enhance the perceived behavioral control and modify the past inattention behaviors of motorcyclists to mitigate inattention riding. In addition, the new intervention program concerning advocacy of good practice on motorcycle riding should be carried out. The contents in models of intervention should suggest surrounding psychological mediating factors, such as seeking of sensational personality, increasing subjective norm, social identity, and perceived behavioral control, to increasing attention riding behaviors.

The strengths of this study are dealing with the collecting prospective measures of participants regarding inattention-riding behavior that the motorcycle riding of adolescent in Thailand performed during the second period of the study. This may be relevant to the aim of the study that resulted in more reliable results than a cross-sectional inattention behavioral reporting. The limitations of this study were data that relied on self-reported inattention riding behavior and generalize ability of the findings.

Since this study did not use new technologies or apparatus to collect data, such as using motorcycle simulator, or other methods, which yielded more precise data than self-reported instrument. The study area was limited within Mahasarakham province. Thus, it can be generalized in the surrounding areas which have the same socio-demographic characteristics of adolescent motorcyclists. However, this study used sample size for predicting inattention motorcycle riding behavior at month 4 where the second data were collected. It was not done for parameter estimated to predict intention, but from the analysis of the predicting intention model, it was found that 95% confident interval of R^2 was for full model, which was rather narrow (less than 0.15). Thus, the sample size used for predicting intention model might be sufficient.

The self-report instrument that aimed for determining an inattention-riding behavior was measured for adolescent motorcyclists' inattention-riding performance, such as cell phone use, talking on cell phone, talking with their carrying pillion passengers, always eye focusing on roadside, focusing on their vehicle, and thinking of other issues without multiple-tasks of motorcycling. The intention predicted models could be predicted by consecutively TPB and extension variables from the seeking sensational personality, subjective norm, anticipated guilt, social identity, and perceived behavioral control. However, inattention-riding behavior is predicted by set of TPB's variables, and less predicted effect from set of intention predicting variables. Therefore, adolescent motorcyclists seem to perform this behavior by not under their volitional control.

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