

## **Attitude, Subjective Norm and Intention toward Using the Statistical Software**

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*Abstract:* - The purpose of this study is to compare the difference of attitude, subjective norm and intention toward using the statistical software between two groups. There are two groups under a natural experimental setting. The experimental group is learning to use the statistical software in a course of software application. The control group is learning to apply the statistical software for analyzing data in a course of research method. A self-administered questionnaire completed by a sample of 42 experimental members and 21 control members. The results showed the difference between two groups. The significant effect of groups disappeared when jointly with attitude and subjective norm played as independent variable in regression model to predict behavioral intention. It is concluded that learning experience played indirect effect on behavioral intention through attitude and subjective norm.

*Key-Words:* - attitude, intention, statistical software application, learning experience

### **1 Introduction**

As the students of the Department of Health Care Administration are required to have the ability of using a statistical software appliance, how to increase the efficiency of learning is an important issue.

There are many packages to analyze data. And most of the packages are friendly for self-learning.

Since the course of statistical software application is not a required subject, the students have the freedom of choice. However, if the students didn't learn the appliance of statistical software first, the performance of research method would be influenced. Furthermore, during summer vacation, the graduates will practice in hospitals and execute projects. For achieving the projects efficiently, the

students must have the ability to analyze data using statistical software.

Many studies have applied the theory of reasoned action to investigate behavior prediction using attitudinal variables. However, even though belief concepts provide an understanding of the context-specific factors influencing behavior [1], these concepts have received relatively less scholarly attention [2].

McFarland and Hamilton’s study [3] showed that system usage is strongly influenced by prior experience. The different learning experience would influence the behavior of using the statistical software. And the attitude toward and subjective norm of behavioral are the determinants of behavioral intention. It is supposed that after taking the curriculum of research method, the students will recognize the importance of the ability to use statistical software. Their attitude and intention will be changed or strengthened.

The primary objectives of this paper are twofold: The first objective is to test the influence of different learning experience on the willingness and attitude of using the statistical software. The second objective is to further explore empirically implications of the theory of reasoned action and theory of planned behavior for using statistical software.

## 2 Literature Review

The theory of reasoned action (TRA), first introduced in 1967, is concerned with the relations between beliefs (behavioral and normative), attitudes, intentions, and behavior [4]. The TRA postulates that a person’s intentions to perform (or not to perform) a behavior is the immediate determinant of that behavior. Intention is defined as the individual’s decision to engage or not to engage in performing the action. In turn, the person’s intentions are a function of the person’s attitude toward the behavior, and his/her subjective norms. Attitude towards the behavior is defined as “the evaluative affect of the individual towards performing the behavior” [5]. Subjective norms refer to the social pressure exert on the individual to perform or not perform the behavior. Figure 1 presents a visual overview of TRA. Impressively, these models have received robust support in numerous behavioral domains [7, 8].

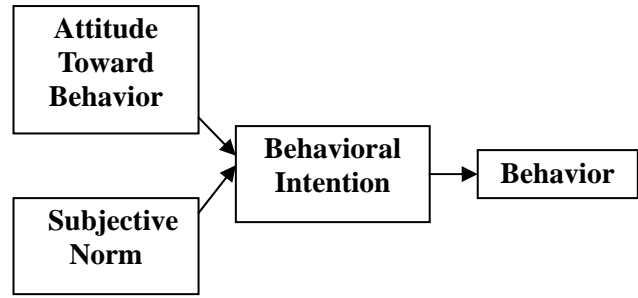


Fig. 1 Theory of Reasoned Action

The theory of planned behavior (TPB) is an extension of the TRA. Ajzen and colleagues [2, 9, 10] added perceived behavioral control to the TRA in an effort to account for factors outside the individual’s control that may affect his intention and behavior. Figure 2 presents the visual overview of planned behavior theory. Ajzen (1991) reviewed 16 studies of predicting behavioral intention, and found that a considerable amount of variance in intentions can be accounted for by attitude, subjective norm, and perceived behavioral control [2]. The multiple correlations ranged from a low of .43 to a high of .94, with an average correlation of .71. The addition of perceived behavioral control to the model led to considerable improvements in the prediction of intentions. Most importantly, the regression coefficients of perceived behavioral control were significant in every study. However, he reminded us that the results for subjective norms were mixed, with no clearly discernible pattern.

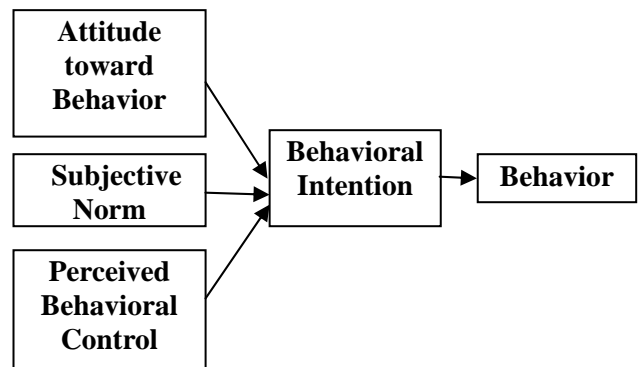


Fig. 2 Theory of Planned Behavior

The concept of perceived behavioral control accounts for perceptions about the “availability of requisite opportunities and resources”, which may differ from actual control [2]. That is to say, perceived control is determined by control beliefs concerning the presence or absence of resources for and impediments to behavioral performance, weighted by the perceived power or impact of each resource and impediment to a facilitate or inhibit the behavior.

Ajzen argues that a person will expend more effort to perform a behavior when his perception of behavioral control is high. The effect of perceived control declines and intention is a sufficient behavioral predictor in situations in which volitional control over the behavior is high [12].

The theory postulates that perceived control is an independent determinant of behavioral intention along with attitude toward the behavior and subjective norm. Holding attitude and subjective norm constant, a person’s perception of the ease or difficulty of behavioral performance will affect his behavioral intention. The relative weights of these three factors in determining intention are expected to vary for different behaviors and populations. Ajzen (1991) speculates that only the attitude measure will be an important explanatory variable in some cases. In others, only attitudes and perceived behavior control may be explaining variables. In still others, the social norm and the attitude may be explaining, which would instead support the theory of reasoned action. Whether control in the volitional sense needs to be considered becomes a testable, empirical issue in the theory.

### 3 Methods

#### 3.1 Participants and procedure

All the students attending the class of research method were asked to participate in the study. They completed the survey in the last class of research method. Multiple item scales were developed for each of the constructs shown in Table 1. The items used to operationalize the constructs of each variable are mostly adopted from relevant previous studies, with necessary wording changes. Specifically, behavioral intention was assessed with three items, attitude toward the behavior four items, subjective norm five items, and perceived behavioral control three items. All items were measured using a seven-point Likert-type scale with anchors ranging from “strongly disagree” to “strongly agree”. Regarding reliability, the measurement had strong internal consistency with all multiple-item

constructs achieving Cronbach’s alpha between 0.749 and 0.937.

#### 3.2 A natural experimental setting

The students of the Department of Health Care Administration are required to complete projects in hospitals independently; they have to be provided with the ability of applying the statistical package. The software SPSS is a statistical and information analysis system running on a personal computer. It is widely accepted by universities and hospitals. The ability to use this software is a basic skill for all the university students whose majors are health related administration. Since each of the students will practice in hospital and implement a project independently. The ability of using the statistical software is very important for them.

Table 1. Items used to measure the constructs in surveys

Variables	Items
Behavioral intention	
BI1	I intend to use this software.
BI2	It is likely that I will use this software.
BI3	I expect to use this software.
Attitude	
A1	Using this software would be a good idea
A2	Using this software would be a foolish idea.
A3	Using this software would be a correct idea.
A4	Using this software would be ridiculous.
Subjective norm	
SN1	People (teachers) important to me supported my use of this software.
SN2	Most of my classmates supported me to use this software.
SN3	Most of my friends supported me to use this software.
SN4	Most of the acquaintances supported me to use this software.
SN5	People who influenced my behavior wanted me to use this software.
Perceived behavioral control	
PBC1	I would be able to use this software.
PBC2	Using this software was entirely within my control.
PBC3	I had the resources, knowledge, and ability to use this software.

The course of the statistical software application is not a required subject. The students have two approaches to learn this subject in their 3<sup>rd</sup> year. One is taking both courses of research method and SPSS software application. The other is only taking the course of research method. And in the class of research method, the students will be required to implement an investigation research within a 4-6 members' team. They will learn how to use the statistical software through doing data analysis. There are two classes of research method, one for these students taking the course of statistical software application, the other for those students not taking the course. Then, it constructs a natural experimental setting.

### 4 Results

Sixty-three students participated in this study, 18 males and 45 females. Of these participants, 42 students were members of experimental group, and 21 were or control group. (Table 1)

Table 1. Profile of all respondents

Variable	N	%
Gender		
Male	18	28.6
Female	45	71.4
Group		
Experiment	42	66.7
Control	21	33.3

The correlation of attitude (A), subjective norm (SN), perceived behavioral control (PBC) and behavioral intention (BI) are presented as table 2. Between attitude, subjective norm and behavioral intention, they are beyond .01 significant correlated. While between perceived behavioral control and behavioral intention, the correlation was not significant.

Table 2. Correlation of attitude, subjective norm, behavioral control and behavioral intention

	Mean	SD	SN	PBC	BI
A (7-28)	21.81	3.48	.468**	.195	.403**
SN(7-35)	33.73	4.79		.175	.542***
PBC(7-21)	12.79	2.94			.186
BI(7-21)	17.30	2.57			

\*\*p<.01 \*\*\*p<.001

A: attitude, SN: subjective norm, PBC: behavioral control, BI: behavioral intention

Before testing the effect of learning experience on behavioral intention jointly with attitude, subject norm, and perceived behavioral control, it is of interest to examine the relations between these variables. The results, as table 3, confirmed that attitude and subjective norm was different between the experimental and control groups, all significant beyond the .01 level. And behavioral intention was higher for experimental group than control group at .05 significant levels. However, the difference between two groups was not observed for perceived behavioral control.

Table 3. Relationship of experience with attitude, subjective norm, behavioral control and behavioral intention

Group	Experiment		Control		t value
	Mean	SD	Mean	SD	
A	22.83	3.29	19.76	2.96	3.74**
SN	35.40	4.03	30.38	4.48	4.34***
PBC	13.17	2.78	12.05	3.15	1.38
BI	17.76	2.42	16.38	2.67	1.99*

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

A: attitude, SN: subjective norm, PBC: behavioral control, BI: behavioral intention

Table 4 presents the results of hierarchical regression analyses for the prediction of behavioral intention to using statistical software. For the prediction of intentions, attitude and subject norm were entered on the first step, perceived behavioral control on the second step, and the group on the third step. The first step constitutes a test of the TRA. It can be seen that both attitude and subjective norm made significant contributions to the prediction of intention, resulting in a multiple correlation of 0.568.

Table 4. Model predictions of behavioral intention

	R
BI=0.191A+0.452SN	0.568
BI=0.181A+0.444SN+0.073PBC	0.572
BI=0.199A+0.474SN+0.078PBC-0.079G	0.576

A: attitude, SN: subjective norm, BC: behavioral control, BI: behavioral intention, G: Group (experimental/control group)

The improvement of the model's prediction of behavior intention was presented as table 5. The TRA constructs accounted for most of the variance explained. Behavioral control and learning experience did not improve the model's explanatory power. This finding indicates that the original theory of reasoned action, with its implication that attitude and subjective norm can influence intention, but not perceived behavioral control and learning experience.

Table 5. Hierarchical stepwise regression testing

	R <sup>2</sup>	R <sup>2</sup> change	p
A	0.163	0.163	0.001
SN	0.322	0.159	0.000
PBC	0.327	0.005	0.508
Group(E/C)	0.332	0.005	0.541

E/C: Experimental group/Control group

## 5 Discussion and Conclusion

The results show that attitude, subjective norm, and behavioral intention are higher for experimental group, and lend credence to the reasoned action theory, but not to the planned behavior theory.

The primary purpose of the TRA is to explain behavioral intention regardless of whether the behavior is under volitional control. It is successfully predict the behavioral intention in this study.

However, the success of the theory in explaining actual behavior is dependent upon the degree to which the behavior is under volitional control. And the reason that Ajzen (1991) added perceived behavioral control to the model was to overcome its limitations when "dealing with behaviors over which people have incomplete volitional control". The behavior studied is using statistical software over which students have only limited behavioral control. In this situation, perceived control is expected to contribute to the prediction of intentions.

As stated by Ajzen and Madden, many factors can interfere with control over intended behavior, some internal to the individual, others external. In this study, skills, abilities, knowledge, adequate judgment is internal factors; and time, opportunity are external factors. All of these factors may be under one's volitional control [10].

Ajzen and Madden (1986) suggested that the behavior being predicted must not be under complete volitional control. When it is, then the concept of perceived behavioral control becomes

largely irrelevant for prediction of behavior and the theory of planned behavior reduces to the theory of reasoned action. The behavior examined in this study, poses few problems of control. The perceived ease or difficulty of using the statistical software should influence intentions, but when it comes to carrying out those intentions, perceived behavioral control should add little further information of value for the prediction of actual usage.

The difference of behavioral intention between experimental and control groups is significant. However, the significant effect disappeared when jointly with attitude and subjective norm as independent variable in regression model to predict behavioral intention. It is concluded that the effect of learning experience is through attitude and subjective norm, rather than directly on behavioral intention.

Between experimental and control groups there is difference for attitude and subjective norm. The experimental group members had more positive attitude and higher subjective norm toward usage. It is concluded that taking more time and opportunity would improve the attitude and subjective norm, and then improve the behavioral intention.

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