
**THE EFFECT OF THE CREATIVITY OF MOBILE GAME PLAYERS
ON THE THEORY OF PLANNED BEHAVIOR**

HONG-WEN LIN

Associate Professor, Department of International Trade
Chinese Culture University
Taipei, Taiwan (R.O.C.)

YA-CING JHAN*

Ph.D. Candidate, Department of Business Administration
National Taiwan University of Science and Technology
Taipei, Taiwan (R.O.C.)

<https://doi.org/10.37602/IJSSMR.2021.4603>

ABSTRACT

In this mobile game-based research, 222 valid online questionnaires were collected, on which a regression analysis was conducted to investigate the effect of the creativity of players on the Theory of Planned Behavior. The findings showed that the stronger the creativity is, the more it affects attitudes, subjective norms and perceived behavioral control. And the stronger the attitude, subjective norm, and perceived behavioral control are, the more they influence the behavior intention of players to play mobile games. All research hypotheses were supported by the findings.

Keywords: Theory of Planned Behavior, Attitude, Subjective Code of Conduct, Perceptual Behavior Control, Behavioral Intention, Creativity

1.0 INTRODUCTION

Mobile games are by far the largest market in the entire gaming industry. According to Research and Markets (2021), mobile games are expected to reach US\$132.8 billion by 2027 at a compound annual growth rate of 15.5%. This indicates that mobile games are very popular among players and will be an important part of the entertainment industry in the future. Constantly evolving mobile games are not only increasingly creative in gameplay, but also drive the interest of players in imagination and creativity.

Creativity was first thought of as a gifted ability to create something new, similar to an ability that can't be cultivated and can create something out of nothing (Barron, 1969; Sanderli, 1971). When an individual is able to produce something unusual or novel, such ability is called creativity (Baaset al., 2008; Howard-Jones & Murray, 2003; Kaufmann, 2003; Lubart, 2001). Due to the rapidly changing global industrial environment, researchers and practitioners believe that creativity is the most sought-after core competency in all circles of life in today's society (Chermahini & Hommel, 2010; Shalley et al., 2004).

On the other hand, if creativity is an abstract capability, the Theory of Planned Behavior (TPB) is the concrete behavioral manifestation. TPB originated from the Theory of Reasoned Action (TRA) proposed by Fishbein and Ajzen (1975), which was later transformed into TPB by Ajzen (1985). TPB is a theory that explains the behavioral decision-making process of individuals with three main determinants, namely an individual's attitude, subjective norm and perceived behavioral control to predict his/her personal intention to perform a particular behavior. The TPB has been revised by Ajzen (1985) several times and in turn has become more rigorous and complete, while has improved its ability to predict behaviors (Ajzen, 2001, 2002; Ajzen & Fishbein, 2008).

On the basis of the discussions in the above literature, this research will investigate whether or not the relationship between creativity and TPB affects the behavioral intentions of players towards mobile games in the context of mobile games. Above all, the main purpose of this research was to explore the overall fitness of the TBP model after adding creativity and to examine whether or not creativity has positive effects on the attitude, subjective norm and perceived behavioral control in TPB and to understand the effect of attitude, subjective norm, perceived behavioral control on behavioral intention.

2.0 RESEARCH HYPOTHESIS

2.1 Relationships of creativity to attitude, subjective norm, perceived behavioral control

In terms of the relationship between creativity and attitude, creativity research focuses mainly on the personalities of the creators themselves, such as abilities, habits and attitudes (Nusbaum & Silvia, 2011). Williams (1980) believes that cognitive and affective behaviors have a significant impact on unleashing the potential for creativity and that the affective behaviors mentioned refer to being more adventurous, curious, imaginative and challenging in learning. Valentine et al. (2011) also pointed out that encouraging employees to be creative would affect their attitude towards work. Above all, this research brings forward the following hypothesis that H1: creativity of players has a positive effect on their attitudes.

In terms of the relationship between creativity and subjective norms, a corporate culture strengthened with subjective norms and creativity shall produce beneficial working responses in a collaborative manner. In particular, employees are encouraged to be creative at work, a move that is likely to improve the attitudes of employees towards work. In terms of encouraging employees, creative thinking fosters strong subjective behaviors, which therefore is associated with creativity (Oliver et al., 2009). Valentine et al. (2010) also found that subjective norms are crucial to the development of creativity and a creative mindset. Thus, this research brings forward the following hypothesis that H2: creativity of players has a positive effect on their subjective norms.

In terms of the relationship between creativity and perceived behavioral control, Rogers (1983) concludes that perceived behavioral variables and creative attributes, such as relative advantage, compatibility, complexity, trialability and observation, have an impact on the attitude of individuals toward being creative and their user behavior. In perceived behavior and creativity, relative advantage, compatibility and complexity have an impact on the acceptance behavior toward information technology (Taylor & Todd, 1995a). Moore and

Benbasat (1991) also points out that an individual's information technology and perceptions of creativity have an impact on their behavior toward such information technology. Thus, this research brings forward the following hypothesis that H3: creativity of players has a positive effect on their perceived behavioral control.

2.2 Relationships of attitude, subjective norm, perceived behavioral control to behavior intentions

In terms of the relationship between attitudes and behavioral intentions, previous studies have shown that when users have positive attitudes towards information technology, they also have stronger intentions to use that information technology (Taylor & Todd, 1995b). It is also confirmed in the online games-related studies that gamers play online games because of their positive attitude towards online games (Chang & Zhang, 2008; Hsu & Lu, 2004). Above all, this research brings forward the following hypothesis that H4: attitudes of players toward mobile games have a positive effect on behavioral intentions.

In terms of the relationship between subjective norms and behavioral intentions, previous studies have shown that use intentions are under the influence of subjective norms (Ajzen & Fishbein, 1980). In studies on the adoption and use of information technology, it has also been shown that subjective norms have a significant effect on use intentions (Karahanna et al., 1999). In the social network games related studies, it is also suggested that subjective norms have a positive impact on the intention of users to continue playing social network games (Kim & Jang, 2014). Therefore, this study brings forward the following hypothesis that H5: subjective norms of players toward mobile games will have a positive effect on behavioral intentions.

In terms of the relationship between perceived behavioral control and behavioral intention, Ajzen and Driver (1992) argues that the inclusion of perceived behavioral control in the model will significantly enhance the explanatory power of the model. Hagger et al. (2002) found that perceived behavioral control has a positive effect on behavioral intentions and actual behaviors when compiling previous related studies. Above all, this research brings forward the following hypothesis that H6: perceived behavioral control of players toward mobile games has a positive effect on behavior intentions.

3.0 RESEARCH METHODS

3.1 Research structure and questionnaire design

This study tries to use creativity as a new structural variable with TPB as the main research base and proposes the following research structure based on the hypothetical inferences from previous literature, research structure as shown in figure 1.

In the creativity focused section, the questionnaire is revised with six Scott and Bruce (1994) questions and one Webster and Martocchio (1995) question to measure the creative attributes of players when playing mobile games. In the attitudes focused section, the questionnaire is revised with Fishbein and Ajzen (1975) questions. There are a total of four questions to measure the attitudes of players towards playing mobile games. In the subjective norms focused section, the questionnaire is revised with three Deutsch and Gerard (1955) questions,

mainly to measure how players handle the perceptions of their peers when playing mobile games. In the perceived behavioral control-focused section, the questionnaire uses three Webster et al. (1993) questions to measure the control of players over mobile games. Finally, in this research, the 6 other quantitative questions are used taking into account the research of Davis et al. (1989), Davis (1993), Venkatesh and Davis (1996) to measure the behavior intentions of players towards playing mobile games.

This study has a total of 23 quantitative questions with the seven-point Likert Scale used, with 1 being "strongly disagree" and 7 being "strongly agree." At the same time, the questionnaire also asks for the demographics of the respondents, including gender, age, level of education and frequency of playing mobile games, for the purpose of sample analysis.

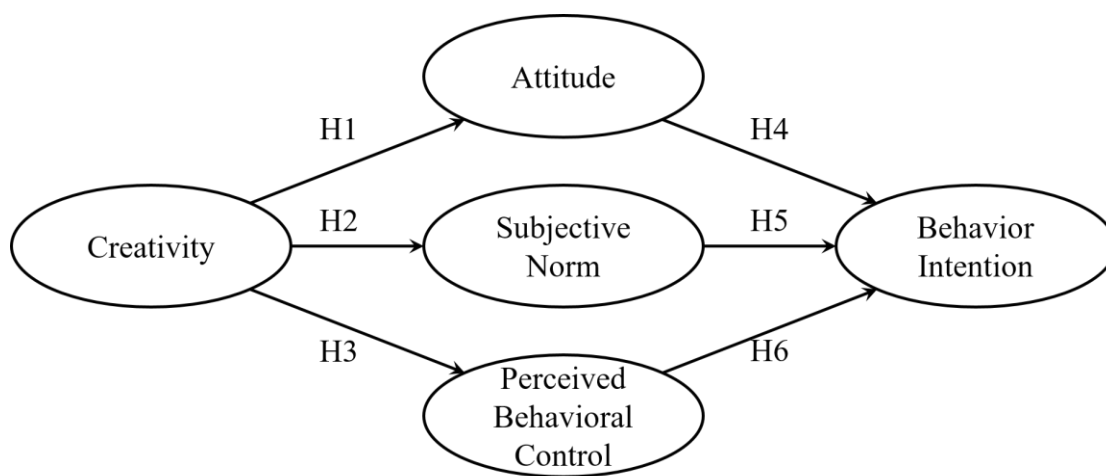


Figure 1. Research structure

3.2 Sample statistics

The questionnaires were distributed through an online platform between April and June 2020. 232 responses were received, of which 10 invalid questionnaires were excluded. 222 valid questionnaires were collected, with a valid return rate of 95.7%.

The gender ratio is 45% for males and 55% for females. The largest age group is 21-30 years old, approximately accounting for 76.6% of the whole sample. In terms of highest academic achievement, 31.5% has a post-graduate degree or above, 59% has a college or university degree and 9.5% has a high school degree or below. In terms of play frequency, 58.6% plays 7 times per month, 15.8% plays 4~6 times and 25.7% plays less than 3 times. Demographics of participants as shown in table 1.

Table 1. Demographics of participants

Measure	Item	Frequency	Percentage
Gender	Male	100	45.0
	Female	122	55.0
Age	20 or less	16	7.2
	21-30	170	76.6

	31-40	22	9.9
	Above 41	14	6.3
Education	Graduate	70	31.5
	Undergraduate	131	59.0
	High school graduate or below	21	9.5
Playing frequency (Weekly)	Less than 3 times	57	25.7
	4-6	35	15.8
	7 times or more	130	58.6

3.3 Questionnaire reliability analysis

In this research, IBM SPSS Statistics 20 is used for reliability analysis to examine the Cronbach’s α coefficient for each construct. The analysis shows that the Cronbach’s α values of the five constructs fall between 0.85 and 0.95, indicating that the scale used in this research has high reliability. Cronbach’s α coefficient analysis is shown in table 2.

Table 2. Cronbach’s α coefficient analysis

Variable	Number of questions	Cronbach’s α
Creativity	7	0.926
Attitude	4	0.925
Subjective norm	3	0.855
Perceived behavioral control	3	0.940
Behavior intention	6	0.942

4.0 RESULT

4.1 Effect of creativity on attitude, subjective norm, perceived behavioral control

In this research, simple regression analysis is used to verify the analysis of the relationship of creativity to attitudes, subjective norms, and perceived behavioral control. In this research, creativity is used as an independent variable and attitude, subjective norm and perceived behavioral control are used as dependent variables. The analysis reveals a significant positive correlation of creativity with attitudes, subjective norms, and perceived behavioral controls. Where β of creativity to attitude is 0.596 (T-value = 11.005, p-value (0.000) < 0.001). β of creativity to subjective norm is 0.521 (T-value = 9.057, p-value (0.000) < 0.001). β of creativity to perceived behavioral control is 0.542 (T-value = 9.569, p-value (0.000) < 0.001). The above statistics indicate that the stronger the creativity is, the more it affects attitudes, subjective norms and perceived behavioral control. The result of simple regression analysis is shown in table 3.

Table 3. Result of simple regression analysis

Variable	R2	F-value	β	T-value	p-value
Attitude	0.352	121.113	0.596	11.005	0.000
Subjective norm	0.268	82.027	0.521	9.057	0.000
Perceived behavioral control	0.291	91.558	0.542	9.569	0.000

* Independent variable: creativity

* Dependent variable: attitude, subjective norm, perceived behavioral control

4.2 Effect of attitude, subjective norm, perceived behavioral control to behavior intentions

In this research, multiple regression analysis is used to verify the analysis of the relationship of attitudes, subjective norms and perceived behavioral control to behavior intentions. In this research, attitudes, subjective norms and perceived behavioral control are used as independent variables and behavior intention is treated as a dependent variable. The analysis reveals a significant positive correlation of attitudes, subjective norms, and perceived behavioral controls with behavior intention. First, for the overall model, an R2 of 0.718 indicates that the prediction of behavior intention with attitudes, subjective norms and perceived behavioral control is high in explanatory power and F-value = 188.978 and p-value (0.001) < 0.05 also indicate that the explanatory power is statistically significant. Second, β of attitude to behavior intention is 0.661 (T-value = 14.039, p-value (0.000) < 0.001). β of subjective norm to behavior intention is 0.180 (t-value = 4.528, p-value (0.000) < 0.001). β of perceived behavioral control to behavior intention is 0.140 (t-value = 3.029, p-value (0.003) < 0.05). The above statistics indicate that the stronger the attitude, subjective norm, and perceived behavioral control are, the more they influence the behavior intention of players to play mobile games. Results of multiple regression analysis as shown in table 4, and the test results of the six hypotheses in this study are shown in table 5.

Table 4. Result of multiple regression analysis

Variable	R2	F-value	β	T-value	p-value
(Constant)	0.718	188.978	-	-3.339	0.001
Attitude			0.661	14.039	0.000
Subjective norm			0.180	4.528	0.000
Perceived behavioral control			0.140	3.029	0.003

* Independent variable: attitude, subjective norm, perceived behavioral control

* Dependent variable: behavior intention

Table 5. Result of hypotheses

Hypothesis	Result
H1: creativity of players has a positive effect on their attitudes.	Valid
H2: creativity of players has a positive effect on their subjective norms.	Valid
H3: creativity of players has a positive effect on their perceived behavioral control.	Valid
H4: attitudes of players toward mobile games have a positive effect on behavioral intentions.	Valid
H5: subjective norms of players toward mobile games will have a positive effect on behavioral intentions.	Valid
H6: perceived behavioral control of players toward mobile games have a positive effect on behavior intentions.	Valid

5.0 CONCLUSION

With respect to the fitness of the overall study model, the study findings showed that the creativity of mobile game players fits TPB very well (the results of the research structure are compiled in figure 2), and reaches a significant level of effect in each of the hypotheses of this research. They not only indicate the high correlation between creativity and TPB, but also show that the more creative people are, the more they are able to make decisions based on planned behaviors.

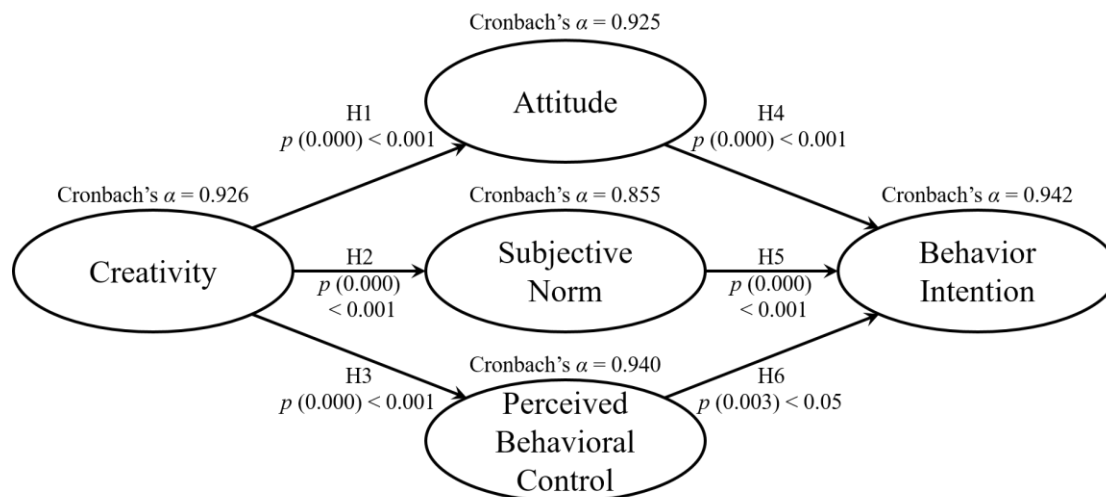


Figure 2. Compile results of research structure

In testing the effect of each predictive variable, it is found that creativity has a positive effect on attitude, subjective norm, and perceived behavioral control, which is significant (H1, H2, H3 are Valid). In view of the fast-changing external environment, many researchers and practitioners also agree that creativity is one of the most sought-after competencies in all areas of work in the world nowadays (Chermahini & Hommel, 2010; Shalley et al., 2004). In other words, businesses now place a lot of emphasis on whether a person has creativity or not. According to the findings of the research, the more creative players are, the more they are able to think in concrete terms and connect them with mobile game-related behavior. This also shows that if a mobile game is designed in a way that allows players to fully showcase their creativity, it will strengthen their intentions to play that mobile game. In addition, the research uses the multiple regression analysis to examine the effects of attitude, subjective norm, perceived behavioral control on behavior intention and the findings of this part also showed that attitude, subjective norm and perceived behavioral control have positive and significant effects on behavior intention (H4, H5, H6 are Valid), which is in line with the results of previous studies in the relevant TPB literature. Attitude, subjective norm and perceived behavioral control are all factors that influence the player’s decision when they intend to take a particular behavior towards mobile games.

REFERENCES

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. Kuhland & J. Beckman (Eds.), Action-control: From cognition to behavior (pp.11-39). Heidelberg: Springer.

- Ajzen, I. (2001). Nature and operation of attitudes. *Annual Review of Psychology*, 52, 27-58.
- Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior. *Journal of Applied Social Psychology*, 32(4), 665-683.
- Ajzen, I., & Driver, B. L. (1992). Application of the theory of planned behavior to leisure choice. *Journal of Leisure Research*, 24(3), 207-224
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitude and predicting social behavior*. Englewood Cliff, NJ: Prentice-Hall.
- Ajzen, I., & Fishbein, M. (2008). Scaling and testing multiplicative combinations in the expectancy–Value model of attitudes. *Journal of Applied Social Psychology*, 38(9), 2222-2247.
- Baas, M., De Dreu, C. K. W., & Nijstad, B. A. (2008). A meta-analysis of 25 years of mood-creativity research: Hedonic tone, activation, or regulatory focus? *Psychological Bulletin*, 134(6), 779-806.
- Barron, F. (1969). *Creative person and creative process*. Oxford, England: Holt, Rinehart, & Winston.
- Chang, J., & Zhang, H. (2008). Analyzing online game players: From materialism and motivation to attitude. *CyberPsychology & Behavior*, 11(6). 711-714.
- Chermahini, S. A., & Hommel, B. (2010). The (b)link between creativity and dopamine: spontaneous eye blink rates predict and dissociate divergent and convergent thinking. *Cognition*, 115(3), 458-465.
- Davis, F. D. (1993). User acceptance of information technology: System characteristics, user perceptions and behavioral impacts. *International Journal of Man-Machine Studies*, 38(3), 475-487.
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User Acceptance of Computer Technology: A Comparison of Two Theoretical Models. *Management Science*, 35(8), 982-1003.
- Deutsch, M., & Gerard, H. B. (1955). A study of normative and informational social influences upon individual judgment. *Journal of Abnormal and Social Psychology*, 51(3), 629-636.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Guilford, J. P. (1956). The structure of intellect. *Psychological Bulletin*, 53(4), 267-293.
- Hagger, M. S., Chatzisarantis, N. L. D., & Biddle, S. J. H. (2002). A meta-analytic review of the theories of reasoned action and planned behavior in physical activity: Predictive

- validity and the contribution of additional variables. *Journal of Sport & Exercise Psychology*, 24(1), 3-32.
- Howard-Jones, P. A., & Murray, S. (2003). Ideational productivity, focus of attention, and context. *Creativity Research Journal*, 15(2-3), 153-166.
- Hsu, C., & Lu, H. (2004). Why do people play on-line games? An extended TAM with social influences and flow experience. *Information & Management*, 41(7), 853-868.
- Karahanna, E., Straub, D., & Chervany, N. (1999). Information technology acceptance across time: A cross-sectional comparison of pre-adoption and post-adoption beliefs. *MIS Quarterly*, 23(2), 183-213.
- Kaufmann, G. (2003). What to Measure? A new look at the concept of creativity. *Scandinavian Journal of Educational Research*, 47(3), 235-251.
- Kim, J., & Jang, C. (2014). A study of factors affecting continuous intention of social network games: Focusing on smart device users. *Journal of Information Technology Services*, 13(3), 235-255.
- Lubart, T. I. (2001). Models of the Creative Process: Past, Present and Future. *Creativity Research Journal*, 13(3-4), 295-308.
- Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research*, 2(3), 192-222.
- Nusbaum, E. C., & Silvia, P. J. (2011). Are intelligence and creativity really so different? Fluid intelligence, executive processes, and strategy use in divergent thinking. *Intelligence*, 39(1), 36-45.
- Oliver, D., Statler, M., & Roose, J. (2009). A Meta-Ethical Perspective on Organizational Identity. *Journal of Business Ethics*, 94(3), 427-440.
- Research and Markets (2021). *Mobile Entertainment - Global Market Trajectory & Analytics*. San Jose, CA: Global Industry Analysts, Inc.
- Rogers, E. M. (1983). *Diffusion of innovations*. New York, NY: Free Press.
- Sanderlin, O. (1971). *Creative teaching*. New Jersey, NJ: AS Barnes and Co.
- Scott, S. G., & Bruce, R. A. (1994). Determinants of innovative behavior: A path model of individual innovation in the workplace. *Academy of Management Journal*, 37(3), 580-607.
- Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of Management*, 30(6), 933-958.

- Taylor, S., & Todd, P. (1995a). Understanding information technology usage: A test of competing models. *Information Systems Research*, 6(2), 144-176.
- Taylor, S., & Todd, P. (1995b). Decomposition and crossover effects in the theory of planned behavior: A study of consumer adoption intentions. *International Journal of Research in Marketing*, 12(2), 137-155.
- Valentine, S., Godkin, L., & Varca, P. (2010). Role conflict, mindfulness, and organizational ethics in an education-based healthcare institution. *Journal of Business Ethics*, 94(2), 455-469.
- Valentine, S., Godkin, L., Fleischman, G., & Kidwell, R. (2011). Corporate ethical values, group creativity, job satisfaction and turnover intention: The impact of work context on work response. *Journal of Business Ethics*, 98(3), 353-372.
- Venkatesh, V., & Davis, F. D. (1996). A model of the antecedents of perceived ease of use: Development and test. *Decision Sciences*, 27(3), 451-481.
- Webster, J., & Martocchio, J. J. (1995). The differential effects of software training previews on training outcomes. *Journal of Management*, 21(4), 757-787.
- Webster, J., Trevino, L. K., & Ryan, L. (1993). The dimensionality and correlates of flow in human-computer interactions. *Computers in Human Behavior*, 9(4), 411-426.
- Williams, F. E. (1980). *Creativity assessment packet (CAP): Manual*. Buffalo, NY: D.O.K. Publishers.