

## Competitive Research Article

Pingying Zhang\*, Dongyuan D. Wang and Crystal L. Owen

# A Study of Entrepreneurial Intention of University Students

**Abstract:** Studying entrepreneurial intention has long been an important topic in the field of entrepreneurship. In this paper, we investigate entrepreneurial intention by applying the theory of planned behavior by Ajzen (1991. “The Theory of Planned Behavior.” *Organizational Behavior and Human Decision Processes* 50(2):179–211), which describes that intention of a behavior depends on attitude, social norm, and controlled behavior. In our context, intention to start a business is thus a function of the three determinants. We have also explored two additional contextual determinants: short-term risk taking preference and psychological well-being. We propose individuals with a short-term risk taking preference are likely to initiate a venture. Similarly, individuals who score high on psychological well-being are likely to start a business too. We have used the structural equation modeling technique to examine 275 survey responses from students of a large southern university in the U.S. Consistent with earlier research, we found that social norm, controlled behavior, and short-term risk taking preference are positively associated with entrepreneurial intention. However, to our surprise, attitude fails to generate a significant impact on entrepreneurial intention, which is also negatively associated with psychological well-being. Discussions of results are presented, and future research possibilities are suggested.

**Keywords:** entrepreneurial intention, the theory of planned behavior, risk preference, psychological well-being

DOI 10.1515/erj-2014-0004

---

**\*Corresponding author: Pingying Zhang**, Department of Management, University of North Florida, Jacksonville, FL, USA, E-mail: pingying.zhang@unf.edu

**Dongyuan D. Wang**, Department of Psychology, University of North Florida, Jacksonville, FL, USA, E-mail: dwang@unf.edu

**Crystal L. Owen**, Department of Management, University of North Florida, Jacksonville, FL, USA, E-mail: cowen@unf.edu

# 1 Introduction

Entrepreneurs play an increasingly important role in the wealth creation of today's society. Examining entrepreneurial intention can improve our understanding of the potential entrepreneurial behavior. Entrepreneurial intention captures a state of mind that directs individuals' focus to achieve a goal or something (Bird 1988). Individuals with intention to start a business are highly likely to carry it out (Ajzen 1991; Fishbein and Ajzen 1975), and it is reasonable to suggest examining entrepreneurial intention is a meaningful approach to studying actual entrepreneurial behavior. The significance of examining entrepreneurial intention is evident from recent empirical studies in the field of entrepreneurship (Diaz-Garcia and Jimenez-Moreno 2010; Lee et al. 2011; Shinnar et al. 2012; Siu and Lo 2013).

There are multiple approaches to studying entrepreneurial intention. The theory of planned behavior has been widely applied to study intention (Ajzen 1987, 1991; Ajzen and Fishbein 1980). The theory claims that attitude, social norm, and controlled behavior predict intention of an action. Earlier studies of entrepreneurial intention applying the theory of planned behavior have explored these three determinants. For example, from the aspect of attitude, researchers have examined how individual attitude influences IT professionals' intention to start a business (Lee et al. 2011). From the aspect of social norm, researchers have analyzed the impact of cultural values and gender difference on entrepreneurial intention (Diaz-Garcia and Jimenez-Moreno 2010; Shinnar et al. 2012; Siu and Lo 2013). From the aspect of controlled behavior, researchers have explored self-efficacy that measures the perceived entrepreneurial skill and examined its effect on entrepreneurial intention (Chen et al. 1998; Zhao et al. 2005). However, it is important to notice a variation in the actual application of the theory: the three determinants have been examined simultaneously or separately across studies. That is, given a specific context, researchers have selectively used different determinants to build their corresponding models (Shinnar et al. 2012; Siu and Lo 2013).

In total, the three determinants of the original model explain more than half of the variance of intention, but the predictive strength of the determinants changes from one context to another. The attitude is believed to be the strongest determinant among the three in predicting intention (Ajzen and Fishbein 1980). For example, under different research contexts, study has shown that attitude toward a specific behavior explains much more variations of intention than social norm and controlled behavior (Ajzen 1991). In our investigation of entrepreneurial intention of university students, we have applied all three

determinants in the modeling process. In addition, we are encouraged to explore contextual determinants to bring more nuances to the finding (Ajzen 1991). Specifically, two additional determinants are explored: short-term risk taking perception and psychological well-being.

Entrepreneurial activities are risky endeavors by nature, and examining risk is a central part of entrepreneurial intention. This aspect is however not included in the original theory of planned behavior. Risk describes a preference to uncertainty with a distribution of possibilities over certainty. Research has shown that a positive attitude toward risk or a willingness to bear uncertain results is associated with entrepreneurial intention (Douglas and Shepherd 2002). Nevertheless, the above general understanding of risk is insufficient. We could not tell entrepreneurs from non-entrepreneurs using a general risk preference over time (Brockhaus and Horwitz 1986; Dunkelberg and Cooper 1982; Palich and Bagby 1995). We focused on the temporal feature of risk. It examines the effect of time on risky decisions (Bird 1988; Das and Teng 1997). Studies exploring temporal feature of risk have shown interesting results. For instance, individuals are likely to take risks when gains are immediate and losses in a distant future (Lopes 1996; Vlek and Stallen 1980). Das and Teng (1997) developed a theoretical typology of entrepreneurship in light of the temporal feature of risk. Their work has enriched our understanding of the difference between a long-term and short-term risk taking preference. It is apparent some entrepreneurs are willing to bear the risk for one year or less, while others can do it for a longer period. Nevertheless, empirical studies of the time effect of risk are limited.

Psychological well-being has emerged as an interesting phenomenon in entrepreneurship in recent years (Shepherd and Haynie 2009; Uy et al. 2013). Psychological well-being describes individuals' positive emotions about their overall human functioning (Aldwin and Revenson 1987). The positivism is measured from six dimensions. However, not all dimensions are equally important to our inquiry in entrepreneurial intention, and we have focused on the dimension of self-determination. Self-determination reflects the degree of autonomy seeking, which is regarded as a distinctive entrepreneurial trait (Bird 1988; Brockhaus 1982; Brockhaus and Horwitz 1986).

The contribution of this paper is two-fold. First, research of risk behavior of entrepreneurs has provided us a rich literature. We continue the discussion of risk preference based on propensity and perception and integrated the two aspects with the temporal feature of risk to develop the concept of short-term and long-term risk taking preference. To our best knowledge, this is a novel approach and may encourage future research in this area. Second, the contextual setting of this study is university students. We have adjusted the theory of

planned behavior by including short-term risk taking preference and psychological well-being. The contextual setting enables us to appreciate our findings of entrepreneurial intention that is unique to university students.

The structure of this paper is as follows. First, we present the theoretical background supporting the development of five hypotheses. Second, we explain the survey method and the structural equation modeling (SEM) technique used in the study, followed by SEM analytical results. Finally, we conclude the paper with discussions and future research possibilities.

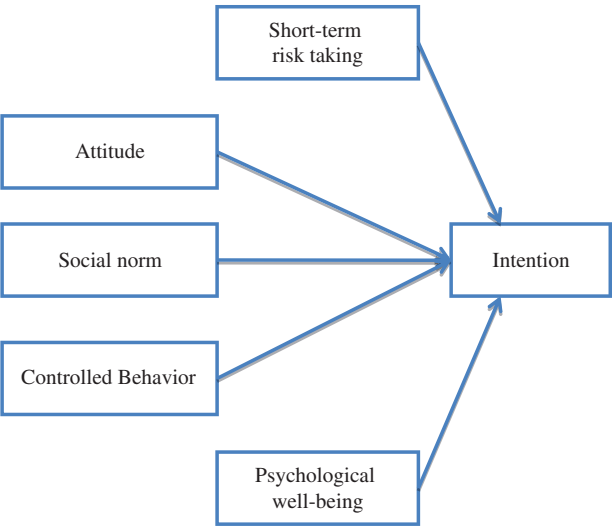
## 2 Backgrounds and hypotheses

When we examine human behavior, the theory of planned behavior has shown a strong potential in explaining intention and actual behavior (Ajzen 1991). The theory is built upon the theory of reasoned action (Ajzen and Fishbein 1980), where intention together with resources under control predicts actual behavior. Beyond the reasoned action, the planned theory provides a conceptual framework to examine intention. There are three predominant determinants in the framework: attitudes, social norm, and the perceived behavioral control. Attitude concerns the degree to which an individual has a favorable or unfavorable evaluation of components of the behavior in question. Social norm addresses the perceived social pressure to perform or not perform the behavior. The last determinant is about resources and opportunities that are necessary to carry out the behavior. In short, the theory of planned behavior approaches intention as a function of attitude toward a behavior, social norm about the behavior, and skills and resources needed to carry out the behavior.

The theory of planned behavior has received empirical supports across different contexts. Still, scholars recommend additional ways to improve the original model. For example, Ajzen suggested incorporating salient contextual variables in addition to the three determinants of the original model (1991). The rationale is that the three determinants can have constraints due to the way how they are defined. For example, an attitude that is measured by general items can fail to predict a specific intention or behavior (Wicker 1969), and an aggregated personality trait can also cause problem in a specific situation (Mischel 1968).

In the field of entrepreneurship, entrepreneurial intention as a social phenomenon has been well documented. There are determinants beyond those applied in the theory of planned behavior. For example, Shapero believed one critical behavioral determinant behind entrepreneurial intention is propensity to act (Shapero 1982), and he has shown its significant impact on intention

(Krueger et al. 2000). We aim to build on the original model of theory of planned behavior by including two determinants: short-term risk taking preference and psychological well-being. We present the model in Figure 1.



**Figure 1:** The model

Theoretically, attitudes, social norm, and controlled behavior are regarded as the three fundamental determinants explaining any planned behavior. Empirically, we have received supports for the claim from the field of entrepreneurship. As we illustrated earlier, attitude concerns the evaluation of a behavior. The evaluation informs individuals how attractive it is to undertake the behavior in concern. It is found that when individuals’ perception of the attractiveness of starting a business goes up, their entrepreneurial intention will also go up (Krueger et al. 2000). Similarly, the strength of perceived social support and the belief in self-efficacy are also positively associated with entrepreneurial intention (Krueger et al. 2000; Siu and Lo 2013; Zhao et al. 2005). Nevertheless, disagreement about the impacts of the three determinants also exists. For example, one study has found that entrepreneurial attitude does not significantly predict entrepreneurial intention (Siu and Lo 2013), and another has only found support for the impact of attitude and controlled behavior on entrepreneurial intention (Krueger et al. 2000). The inconsistency in the empirical results indicates a necessity to model all determinants of the theory of planned behavior in different contextual settings.

When we explore entrepreneurial intention among university students, we believe the general prediction of planned behavior holds for our investigation. That is, attitude, social norm, and controlled behavior are positively associated with the intention of starting a business. However, we recognize the importance of the approach to the measurement of attitude. In our investigation, entrepreneurial attitude is beyond a general assessment of the attractiveness of starting a business. The evaluation of attitude is related to the expected value of starting a business, which is a weighted value among a set of values. Study shows that values of starting a business include financial rewards, personal satisfaction, stress control, personal quality of life, and independence (Krueger et al. 2000). Assessment of attitude based on value can avoid the failure caused by a general evaluation (Wicker 1969). As a result, individuals with a high expected value will show a strong tendency to start a business.

*Hypothesis 1. The expected value of starting a business is positively associated with entrepreneurial intention.*

Social norm captures the social influence to perform or not to perform an entrepreneurial action. This is a critical determinant for individuals without entrepreneurial experience. University students are easily to be influenced by their social environment when they have little entrepreneurial experience. Opinions from friends and family members are likely to encourage or discourage a potential entrepreneurial behavior.

*Hypothesis 2. The supportive view on starting a business from social environment is positively associated with entrepreneurial intention.*

The controlled behavior reflects resources and opportunities individuals believe they can acquire or develop in order to start a business. There are two types of resources; one is tangible and the other intangible. University students in general lack tangible resources such as capital to start a business. But they may not lack intangible resources such as skills of networking, the ability to see a potential opportunity, and the talent to commercialize a product. The intangible resources have been recognized and examined in terms of self-efficacy, which is found to be positively associated with entrepreneurial intention (Chen et al. 1998). As a result, university students who believe they have acquired the skill and talent to start a business are likely to become an entrepreneur.

*Hypothesis 3. The perceived skill and talent required to start a business is positively associated with entrepreneurial intention.*

## 2.1 Risk taking

Risk taking preference is believed to be a distinctive entrepreneurial trait. Those who start a business of one kind or another seem to suggest a tolerance for risk (MacCrimmon and Wehrung 1986; McClelland 1961, 1965). A common understanding of risk taking of entrepreneurs is that entrepreneurs love to take risks more than the rest. However, this assumption appears to be insufficient over time. Studies examining entrepreneurial risk taking preference have shown that an entrepreneur can be risk taker (Bird 1988) and risk averse as well (Dickson and Giglierano 1986; Dunkelberg and Cooper 1982; Palich and Bagby 1995). Two important concepts are developed to understand the risk taking preference: one is risk propensity and the other risk perception (Sitkin and Pablo 1992; Sitkin and Weingart 1995).

Risk propensity describes the tendency of individuals who take risky actions (Sitkin and Pablo 1992). It is a willingness to take risks in a consistent manner, reflecting how individuals evaluate risk in general. A low risk propensity indicates a low willingness to take risk, and a high risk propensity indicates a high willingness to take risk. The risk taking tendency, according to Sitkin and Pablo, has also taken into account individual predispositions that cause individuals to take or avoid risks. To a certain degree, study of predisposition examines personal traits and found that entrepreneurs are different from non-entrepreneurs in traits such as the level of maturity (MacCrimmon and Wehrung 1986). Risk perception involves the labeling of situations, the probability estimation, and the confidence in doing so (Sitkin and Pablo 1992). This concept concerns the analysis of opportunity and threat (Palich and Bagby 1995) and controllable returns (Sarasvathy et al. 1998), which is different from examining the willingness to take risks in general. For example, Palich and Bagby surveyed entrepreneurs and non-entrepreneurs and failed to find significant difference in the risk propensity measurement. Entrepreneurs are not necessarily more risk seeking than non-entrepreneurs. However, when Palich and Bagby used the technique based on risk perception to survey the same individuals, they found that entrepreneurs are more positive than non-entrepreneurs in risk perception. They focus more on opportunity than threats, more on strengths than weaknesses, and more on potential improvement than future problems (Palich and Bagby 1995). It is possible that an entrepreneur is risk seeking under the lens of risk propensity but risk averse under the lens of risk perception. Research further suggests that a risk preference based on perception is more effective than risk propensity in certain circumstances (Sitkin and Pablo 1992; Sitkin and Weingart 1995).

We believe that time is a key behind risk propensity and risk perception. Regardless of the focus, time is an essential factor of why risk exists (Lopes

1996). Time modifies risk taking behavior. It is the unknown outcome into the future that makes a decision risky. The length of waiting time for the unknown outcome can be short or long such that we have a short-term or long-term risk taking preference (Das and Teng 1997). For example, students who do not take the necessary time to study for the mid-term exam may fail the exam. They show a short-term risk taking preference. However, smokers who do not take necessary steps to curb the smoking habit may develop lung cancer in the distant future. They show a long-term risk taking preference.

The long-term and short-term risk taking preference captures the basic feature of risk propensity and perception. In the earlier example, students who are low in the short-term risk taking preference are likely to have a low risk propensity and a high risk perception. They will study hard to ensure they score well in the mid-term exam. They are risk averse in short-term. Students who are high in the short-term risk taking preference, on the other hand, have a high risk propensity and a low risk perception. They may believe that the exam will be easy, and there is no need to prepare for it. They are risk lovers in short-term. Similarly, smokers who avoid long-term risk taking are likely to have a low risk propensity and a high risk perception, and they will try to stop smoking. They are risk averse in long-term. On the other hand, smokers who prefer long-term risk taking have a high risk propensity and a low risk perception, and they will continue smoking as they may believe that they have some genetic traits shielding them from developing lung cancer. They are risk lovers in long-term.

When entrepreneurs start a new business, they have different preferences between long-term and short-term risk taking. For example, if entrepreneurs start a business in which they are willing to bear performance uncertainty for a short period of time such as one year, then they prefer short-term risk taking. On the other hand, if the entrepreneurs start a business in which they are ready to bear performance uncertainty for a longer period of time, then they prefer long-term risk taking. Entrepreneurs who prefer short-term risk taking focus more on doing what they like at the current time than planning for the long-term, while entrepreneurs who prefer long-term risk taking emphasize a long-term evaluation of multiple aspects of a business such as its growth potential (Das and Teng 1997). When individuals with a short-term risk taking preference undertake a new venture, they show distinctive personality traits. They value passion-driven more than a rational long-term planning, and they focus more on the present than a distant future (Smith and Miner 1983). These personality traits earn such entrepreneurs the name of craftsman entrepreneurs (Smith and Miner 1983). Craftsman entrepreneurs' intention is largely recognized as a crucial part in new venture creations (Bird 1988, 1992). When individuals with a long-term risk taking preference start a new venture, planning is a crucial element in the



process of risk evaluation. In this case, individuals constantly weigh options and plan for the distant future (Smith and Miner 1983). The problem of planning is the possibility of missing the boat. They let go business opportunities that they feel are too early to evaluate. Albeit not pursuing the entrepreneurial activity in a timely fashion can result in losses, the delayed losses are discounted more than delayed gains for long-term risk takers (Shelley 1994). We could conclude that individuals who favor planning into the future bring fewer businesses into being than individuals who favor doing what one enjoys in the present.

Das and Teng also indicate that entrepreneurs with a short-term risk taking preference have a high risk propensity and a low risk perception. This type of entrepreneurs is quick in action to initiate a new business. On the other hand, entrepreneurs with a long-term risk taking preference have a low risk propensity and a high risk perception. They are less likely to start a new venture in a near term. To sum up, the temporal dimension of risk preference allows us to predict the likelihood of starting a business. The positive impact of the short-term risk taking preference on entrepreneurial intention is likely to exist in addition to the impact of the three determinants from the theory of planned behavior (Ajzen 1991).

*Hypothesis 4: Short-term risk taking preference is positively associated with entrepreneurial intention in the presence of attitude, social norm, and controlled behavior.*

## 2.2 Psychological well-being

Psychological well-being is a multidimensional self-evaluation construct. It encompasses an in-depth understanding of self-wellness from six dimensions: a sense of self-determination, confidence in personal growth and development, acceptance of self in spite of weaknesses, belief in the purpose and meaning of one's life, positive relationship with others, and capacity to manage the surrounding environment (Ryff 1989, 1995; Ryff and Keyes 1995). Researchers from the field of psychology believe that individuals with a strong psychological well-being tend to have a higher level of positive attitude, which empowers them to live their life meaningfully and solve problems. For example, this positivism benefits individuals in handling crisis situations smoothly (Fredrickson et al. 2003). In the context of organization, a positive psychological well-being is linked to employees' performance as well, where employees with strong psychological well-being are more productive than their peers with low psychological well-being (Cropanzano and Wright 1999; Donald et al. 2005; Harter et al. 2003). In the context of entrepreneurship, researchers have studied entrepreneurial practices that could enhance individual psychological well-being (Uy et al. 2013).

Among the six unique dimensions, the dimension of self-determination seems to be an important aspect that differentiates entrepreneurs from non-entrepreneurs. The degree of self-determination concerns the need for control and indicates individual's autonomy seeking behavior. In earlier studies, the need for control significantly strengthens entrepreneurial intention to start a business (Bird 1988; Brockhaus 1982). It is likely that psychological well-being associated with a strong self-determination can influence entrepreneurial intention in addition to the impact of the three determinants from the theory of planned behavior.

*Hypothesis 5: Psychological well-being due to self-determination is positively associated with entrepreneurial intention in the presence of attitude, social norm, and controlled behavior.*

### 3 Methodology

We have applied the structure equation modeling (SEM) technique to examine the six constructs of the paper and relationships between them. SEM is a proper technique in studies of social science (Nunally 1978). We have used SPSS AMOS 19 to perform the SEM analysis.

#### 3.1 Data

We have collected the data through survey method. The subjects are undergraduate business school students of a large southern university in the U.S. Students in the final term of their undergraduate study took the survey within a two-week period. There are 275 responses used for the SEM analysis. Among them 108 were female. Eighty-six percent of the students were between 21 and 29 years old. No significant biases were found regarding the time they answered the questionnaire. On average, it took the students seven minutes to complete the survey, using a 7-Likert-like scale from strongly disagree to strongly agree.

#### 3.2 Constructs

We have used both exploratory and confirmatory factory analysis to examine the constructs used in the paper. These constructs are entrepreneurial intention, attitude, social norm, controlled behavior, short-term risk preference, and psychological well-being. Earlier studies are used to guide us in defining these constructs

(Krueger et al. 2000; Ryff 1989, 1995; Ryff and Keyes 1995; Shepherd and Haynie 2009; Siu and Lo 2013; Zhao et al. 2005). Cronbach’s alpha was used to check the reliability of the constructs. Cronbach alpha value perhaps is the most commonly used method for that purpose (Bollen 1989). The alpha value between 0.2 and 0.4 is considered reliable (Briggs and Cheek 1986); however, Bollen suggests that the higher the value, the better the reliability (1989). A value of 0.70 is considered satisfactory for most studies (Nunally 1978). We have presented the factor loadings of each construct and the Cronbach alpha value in Table 1.

**Table 1:** Factor loadings and Cronbach alpha

	1	2	3	4	5	6
Cronbach alpha	0.892	0.871	0.837	0.899	0.899	0.773
ConBehavior 1	0.916					
ConBehavior 2	0.791					
ConBehavior 3	0.752					
ConBehavior 4	0.746					
Expvalue 1		0.888				
Expvalue 2		0.810				
Expvalue 3		0.749				
Expvalue 4		0.629				
Risk 1			0.923			
Risk 2			0.885			
Risk 3			0.670			
Risk 4			0.550			
Intention 1				0.983		
Intention 2				0.803		
Intention 3				0.802		
Norm 1					0.896	
Norm 2					0.860	
Norm 3					0.757	
PSW 1						0.742
PSW 2						0.701
PSW 3						0.615

Notes: ConBehavior = controlled behavior; Expvalue = expected value; PWS = psychological well-being.

The measurement of entrepreneurial intention has been centered on the statement of how exciting it is to start a business for students. We followed the earlier research of the construct and have used three items (Diaz-Garcia and Jimenez-Moreno 2010; Shinnar et al. 2012; Siu and Lo 2013): “I have thought of starting a business”, “I have been preparing to set up my own business”, “I am going to try hard to set up my own business”. The Cronbach’s alpha is 0.899. In

addition, we checked this construct reliability through the correlation between this construct and the likelihood of students starting a business. The correlation is 0.6. The reliability of intention is satisfactory.

Attitude is measured by using four value-based items. As we argued earlier, value-based measurement is more appropriate than attractiveness-based measurement. As a result, instead of asking the students to score the level of attractiveness to start a business, we ask them to rate a set of values of being an entrepreneur. Then we ask the students to assess the possibility that they obtain such value if they are to start a business. We multiple these two scores to obtain an expected value of starting a business. This approach is also recommended by Ajzen (1991). The items include areas of achieving financial gains, realizing personal satisfaction, enjoying personal quality of life, and controlling work and life stress (Krueger et al. 2000). The reliability of this construct is 0.871.

Social norm is measured in a similar way as attitude. The students first rate how supportive their close family members, friends, and significant others are about the idea of starting a business. Then they rate how important they perceive the opinions of their family members, friends, and significant others. We multiple these two scores to obtain the value of social norm. The construct is reliable with the Cronbach alpha at 0.876.

Controlled behavior measures the level of confidence individuals perceive their skills and talents needed to start a business. In the field of entrepreneurship, the skill and talent is also termed as self-efficacy (Chen et al. 1998; Gomez-Mejia and Balkin 1989). Our measurement thus follows closely with the items of self-efficacy. Four items are used in which the students rate their level of confidence in areas of identifying new business opportunities, creating new products, thinking creatively, and commercializing an idea or new development (Chen et al. 1998; Gomez-Mejia and Balkin 1989). The Cronbach alpha is 0.892.

We have developed the items to measure the short-term risk taking preference. These items are, "Doing what I enjoy is more important than planning for the long-term," "Doing what I enjoy is more important than evaluating the risk in the long-term", "Doing what I enjoy is more important than evaluating the growth in the long-term", and "I spend more time on doing what I enjoy than planning for the long-term". The Cronbach's alpha is 0.837, and the construct is satisfactory.

We have selected three items to measure the construct of psychological well-being from the dimension of self-determination (Ryff 1995; Ryff and Keyes 1995). They are, "I have confidence in my opinions, even if they are contrary to the general consensus", "I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people", and "My decisions are not usually influenced by what everyone else is doing". The reliability of this construct is 0.773. As we mentioned earlier, psychological well-being is a multidimensional

construct from six dimensions. The dimensions are all unique making the whole construct of psychological well-being reflective rather than formative in nature (Lowry and Gaskin 2014). The rest constructs in the paper are formative in nature as the items are from the same dimension for each construct. Therefore, by focusing on one specific dimension we have developed a formative construct for psychological well-being as well. The formative nature of constructs satisfies the SEM analysis performed by SPSS AMOS 19 (Lowry and Gaskin 2014). We have also presented a further discussion of the appropriateness of the measurement in the final section of the paper.

### 3.3 Validity

Validity of a construct means that the construct measures what it is supposed to measure (Nunally 1978). Constructs with little validity concern is an important criterion for a robust structural modeling. We took two steps to ensure validity of the constructs. First, we reviewed earlier studies, examined, and selected items from the previous studies to build the constructs (Krueger et al. 2000; Ryff 1989, 1995; Ryff and Keyes 1995; Shepherd and Haynie 2009; Siu and Lo 2013; Zhao et al. 2005). The high factor loadings of the items (Table 1) indicate a good convergence of the constructs. Second, we conducted validity test using average variance extracted (AVE) method (see Appendix). A convergent construct should have an AVE value above 0.5, and at the same time the correlation of one construct with the other constructs should be smaller than the square root of the AVE of the construct (Lowry and Gaskin 2014). Most of the constructs have met the criteria expect psychology well-being. The AVE of psychological well-being is slightly lower than 0.5. We checked the factor loadings for psychological well-being and concluded that validity is not a concern.

## 4 Structural equation analysis

We have built three SEM models. One is the base model according to the theory of planned behavior (Ajzen 1991), and the other two are the base model with variations. The base model predicts that attitude, social norm, and controlled behavior are positively associated with entrepreneurial intention. The result of the SEM is presented in Figure 2.

Among the three determinants, the effect of attitude is not significant. The coefficients of social norm and controlled behavior are both significant and positive at 0.17 and 0.52, respectively. To assess the model fit, we have used

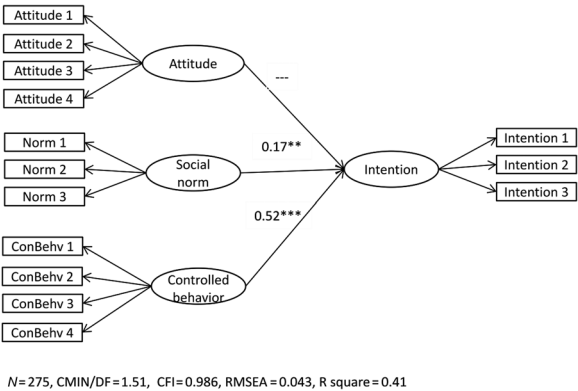


Figure 2: Base model

comparative fit index (CFI) and root mean square error of approximation (RMSEA) (Bentler 1990; Browne and Cudeck 1993). The model has a close fit if the CFI is above 0.95 (Bentler 1990). In the case of RMSEA, the model has a good fit if the value is below 0.05 (Browne and Cudeck 1993). In the base model, CFI is 0.986 and RMSEA is 0.043, indicating a good model fit. The R square is 0.41.

In the first variation, we added the construct of short-term risk taking perspective in the base model. The result is presented in Figure 3. Social norm, controlled behavior, and short-term risk taking preference have a significant and

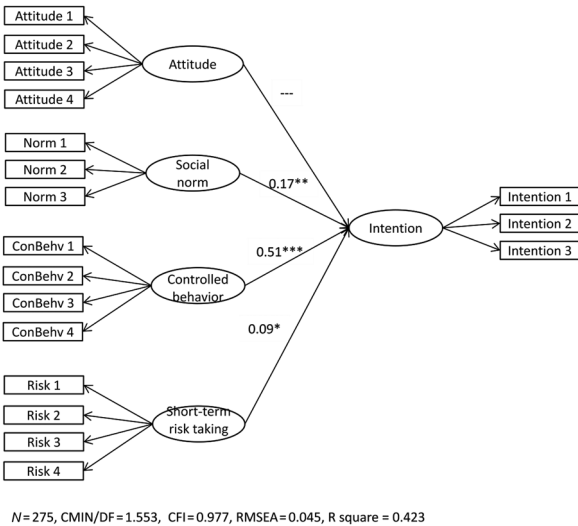
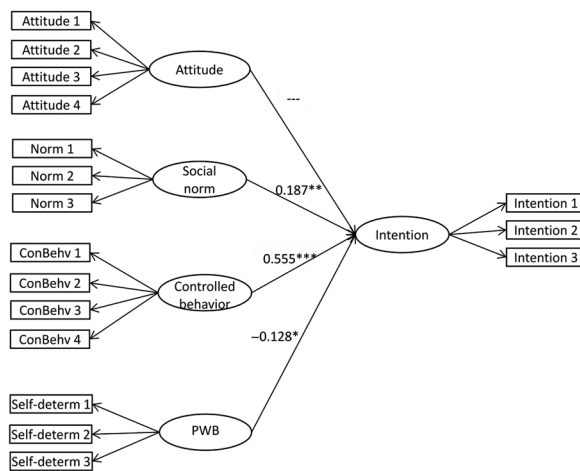


Figure 3: Intention with short-term risk taking preference

positive impact on intention at 0.17, 0.51, and 0.09, respectively. Attitude fails to show any significant influence. The model fits well with the data as CFI is 0.977, and RMSEA is 0.045. The R square is slightly improved to 0.423.

In the third variation, we have replaced the construct of short-term risk taking preference with psychological well-being. The result is similar to the earlier model (see Figure 4), where attitude fails to show significant impact and while social norm, controlled behavior, and psychological well-being are all significant at 0.187, 0.555, and  $-0.128$ , respectively. However, it is important to point out that the impact of psychological well-being is negative. The data still fit the model well where CFI is 0.984, and RSEAM is 0.038. The R square is 0.426.



$N = 275$ ,  $CMIN/DF = 1.402$ ,  $CFI = 0.984$ ,  $RMSEA = 0.038$ ,  $R\ square = 0.426$

**Figure 4:** Intention with psychological well-being

In conclusion, we have found support that social norm and controlled behavior are positively associated with entrepreneurial intention from all three models. The short-term risk taking preference is also positively associated with entrepreneurial intention; however, psychological well-being is negatively associated with the intention. Hypotheses 2–4 have received support.

## 5 Discussion and conclusion

Earlier studies of intention have greatly benefited by applying the theory of planned behavior (Ajzen 1991). This theory has outlined three determinants that

we should examine: attitude, social norm, and controlled behavior. In the field of entrepreneurship, the empirical results are however inconsistent. We continue using the theory of planned behavior and investigate university students' entrepreneurial intention as a function of attitude, social norm, and controlled behavior. In addition, we investigate how short-term risk taking preference and psychological well-being affect entrepreneurial intention. We hypothesize that individuals with a preference to short-term risk taking are positively associated with entrepreneurial intention. Psychological well-being describes a positive emotion of self-functioning and is measured with a focus from the dimension of self-determination. We hypothesize that psychological well-being is also positively associated with the intention to start a business. Survey method and SEM technique are used to test the hypotheses.

Consistent with earlier studies, we have found support for social norm and controlled behavior (Chen et al. 1998; Diaz-Garcia and Jimenez-Moreno 2010; Shinnar et al. 2012; Siu and Lo 2013; Zhao et al. 2005). However, we fail to find support for attitude, a relationship that Siu and Lo also failed to find in their study (2013). According to the theory of planned behavior, attitude is not only an important determinant but also the most important one among the three determinants in predicting intention of any behavior (Ajzen 1991). The divergent result could be explained by a lack of entrepreneurial experience among university students. Without the entrepreneurial experience, university students have a difficult time to accurately assess the expected value of starting a business. That is, university students are unlikely to understand the drawbacks and benefits of being an entrepreneur, and as a result, the variation of attitude correlates little with the variation of intention. Nevertheless, it seems to be a different case for social norm and controlled behavior, where university students can accurately assess these two constructs without entrepreneurial experience. They know how supportive their individual social environment is regarding starting a business, and they also know their inner ability to start a business. The claim of the importance of entrepreneurial experience is verifiable by testing the difference between entrepreneurs and non-entrepreneurs. This could be a direction for future studies.

Regarding the effect of social norm and controlled behavior on intention, we found that controlled behavior has a higher impact than social norm. The difference in the magnitude suggests that controlled behavior is the main drive of entrepreneurial intention among university students. Controlled behavior reflects an evaluation of internal resources, which addresses the question of what we have and what we can do. Social norm looks at the influence of an external environment that may nurture the desire to start a business. We may conclude that nature is more important than nurture in shaping students' intention.



## 5.1 Doers and planners

Time is an essential feature in evaluating risk. We have followed the research of Das and Teng (1997) in defining time. This study has examined the long-term and short-term risk taking preference. We argue that individuals who prefer short-term risk taking are doers, while individuals who prefer long-term risk taking are planners. Doers focus more on passion, and they are more enthusiastic about starting something they enjoy than spending time planning into the unknown future. We found that a short-term risk taking preference is positively associated with entrepreneurial intention. Put it differently, doers are positively associated with entrepreneurial intention. This conclusion is consistent with the result of Bird's studies, where she attributes the majority of venture creations to doers too (Bird 1988, 1992).

Planning is the core feature separating a short-term risk taking preference from a long-term risk taking preference. Although planning may lead to fewer business creations, it is likely the quality of new ventures with long-term planning is better than short-term passion. Planners with a long-term risk taking preference benefit from a rigorous probability analysis prior to the start of any business. The true probability of the future state is, in most cases, unknown (Knight 1921). Assigning probability to future state can be time consuming, but it can be a critical skill which can enable entrepreneurs to secure resources in an volatile environment (Miller 2007). For example, planners could obtain an external financing when the whole industry performs poorly. The analysis of doers with a short-term risk taking preference, on the other hand, is much less rigorous. Doers may not be able screen out weak potentials without a rigorous planning process. Consequently, we expect a different survival rate between doers and planners. We suggest that entrepreneurs with a long-term risk taking preference have a higher survival rate in their businesses than entrepreneurs with a short-term risk taking preference. Nevertheless, our current research design could not test this claim. Future studies can examine the survival rate between entrepreneurs with a short-term risk taking preference and those with a long-term risk taking preference.

We acknowledge that there are other approaches to examining the time dimension of risk. For example, we could study it through the lens of proximate probability distribution of future states (Knight 1921), or individuals' cognition using the perception of risk and the likelihood of taking risk (Sitkin and Pablo 1992), or the psychological utility function based on the formulation of risk (Kahneman and Tversky 1979), or personality characteristics directly related to the length of time (Das and Teng 1997). Among these approaches, we think the prospect theory that analyzes the psychological utility function has a great

potential. Prospect theory articulates that psychological utility is not consistent along the axis of time dimension when they frame risks (Kahneman and Tversky 1979). Examining how individuals frame risks along the axis of time could be an exciting area to research. For example, it would be of a great interest to investigate how a positive and negative framing of a particular risk in short-term and long-term influence intention to start a business.

## 5.2 Psychological well-being

Earlier studies show that individuals with strong psychological well-being are positive and motivated to take control (Ryff 1995). We hypothesize that psychological well-being is positively associated with entrepreneurial intention. The study shows the more positive and self-determined the students are, the less likely they will start a business. The result perhaps could be explained by an inevitable choice facing most university students in their final term – finding a job or starting a business that may not be their first choice. Therefore, keeping all other conditions equal, students, who are less positive and less self-determined, are less confident when they look for a job, and starting a business appears to be more appealing.

We recognize limitations in our application of the construct of psychological well-being. Albeit psychological well-being is used to evaluate individual's positive emotions from six dimensions, we have only focused on the dimension of self-determination. Nevertheless, we believe there is a strong and positive correlation between a construct including all dimensional features and a construct including only one dimension. A strong result of psychological well-being is a sum of strong results of each dimension. Nevertheless, future study should explore the impact of all six dimensions and regress the total impact on entrepreneurial intention. Doing so requires us to apply the SEM with partial least square feature (Lowry and Gaskin 2014).

## 5.3 Potential entrepreneurs

Examining entrepreneurial intention is not the same as studying the actual entrepreneurial behavior. However, it is the closest form to the examination of actual behavior (Ajzen 1991). Our choice of studying university students' entrepreneurial potential has both strengths and weaknesses. On the one hand, many great businesses are started by university students such as FedEx, Dell, Google, Facebook, and Snapchat. We have also witnessed a surge of initiations of

entrepreneurship education in the past decades. For instance, we have classes designed to help students get their ideas off the ground, idea pitch contests targeting at university students have mushroomed, and various workshops have doubled to help students work on startups (Dickey 2013). Investigating entrepreneurial intention among university students seems to be relevant to venture creation. On the other hand, there is still a great portion of university students who are non-entrepreneurs. Examining the actual entrepreneurial behavior can greatly supplement the study of entrepreneurial intention.

### 5.4 Other future research possibilities

There are other limitations in this study. First, the data are collected at one point of time. It would be instrumental if future studies have several data collection points concerning attitude, social norm, controlled behavior, short-term risk taking preference, and psychological well-being. The longitudinal data are more likely to review the fundamental mechanisms behind the intention to start a business. Second, the survey target of this study is university students. Some of them may actually become entrepreneurs. It would be fruitful if future studies could follow the students who had actually started ventures and conduct a comparison analysis on entrepreneurial intention and the determinants.

In spite of the above-mentioned shortcomings, the study has generated some interesting results. We have shown how some determinants affect entrepreneurial intention in a unique manner among university students.

## Appendix

Table 2: Validity tests for constructs

	AVE	Autonomy	Intention	Attitude	ConBehv	Norm	Risk
Autonomy	0.474	<b>0.689</b>					
Intention	0.757	0.243	<b>0.870</b>				
Attitude	0.635	0.493	0.436	<b>0.797</b>			
Controlled behavior	0.677	0.480	0.622	0.610	<b>0.822</b>		
Norm	0.725	0.376	0.427	0.475	0.458	<b>0.851</b>	
Risk	0.591	−0.162	0.078	−0.145	−0.005	−0.037	<b>0.769</b>

Note: The square root of AVE is presented in bold on the diagonal of the table.

## References

- Ajzen, I. 1987. "Attitudes, Traits, and Actions: Dispositional Prediction of Behavior in Personality and Social Psychology." In *Advances in Experimental Social Psychology*, edited by L. Berkowitz, 1–63. New York: Academic Press.
- Ajzen, I. 1991. "The Theory of Planned Behavior." *Organizational Behavior and Human Decision Processes* 50(2):179–211.
- Ajzen, I., and M. Fishbein. 1980. *Understanding Attitudes and Predicting Social Behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Aldwin, C. M., and T. A. Revenson. 1987. "Does Coping Help? A Re-Examination of the Relation Between Coping and Mental Health." *Journal of Personality and Social Psychology* 53:337–48.
- Bentler, P. M. 1990. "Comparative Fit Indexes in Structural Models." *Psychological Bulletin* 107:238–46.
- Bird, B. 1988. "Implementing Entrepreneurial Ideas: The Case for Intention." *Academy of Management Review* 13(3):442–53.
- Bird, B. 1992. "The Operation of Intentions in Time: The Emergence of the New Venture." *Entrepreneurship Theory and Practice* 17(1):11–20.
- Bollen, K. 1989. *Structural Equations with Latent Variables*. New York: John Wiley & Sons.
- Briggs, S. R., and J. M. Cheek. 1986. "The Role of Factor Analysis in the Evaluation of Personality Scales." *Journal of Personality* 54:106–48.
- Brockhaus, R. H. Sr. 1982. "The Psychology of Entrepreneur." In *Encyclopedia of Entrepreneurship*, edited by C. A. Kent, D. L. Sexton, and K. H. Vesper, 39–57. Englewood Cliffs, NJ: Prentice Hall.
- Brockhaus, R. H. Sr., and P. S. Horwitz. 1986. "The Psychology of the Entrepreneur." In *The Art and Science of Entrepreneurship*, edited by D. L. Sexton and R. W. Smilor, 25–48. Cambridge, MA: Ballinger.
- Browne, M. W., and R. Cudeck. 1993. "Alternative Ways of Assessing Model Fit." In *Testing Structural Equation Models*, edited by K. Bollen and J. S. Long, 136–62. Newbury Park, CA: Sage.
- Chen, C. C., P. G. Greene, and A. Crick. 1998. "Does Entrepreneurial Self-Efficacy Distinguish Entrepreneurs From Managers?" *Journal of Business Venturing* 13(4):295–316.
- Cropanzano, R., and T. A. Wright. 1999. "A 5-Year Study of Change in the Relationship between Well-Being and Performance." *Consulting Psychology Journal: Practice and Research* 51:252–65.
- Das, T. K., and B. Teng. 1997. "Time and Entrepreneurial Risk Behavior." *Entrepreneurship Theory and Practice* Winter:69–88.
- Diaz-Garcia, M., and J. Jimenez-Moreno. 2010. "Entrepreneurial Intentions: The Role of Gender." *International Entrepreneurship and Management Journal* 4(4):467–83.
- Dickey, M. R. 2013. These Are the Hottest Startups on College Campuses Right Now. *Business Insider* Jul 31. <http://www.businessinsider.com/college-startups-2013?op=1>.
- Dickson, P. R., and J. J. Giglierano. 1986. "Missing the Boat and Sinking the Boat: A Conceptual Model of Entrepreneurial Risk." *Journal of Marketing* 50(3):58–70.
- Donald, I., P. Taylor, S. Johnson, C. Cooper, S. Cartwright, and S. Roberston. 2005. "Work Environments, Stress and Productivity: An Examination Using ASSET." *International Journal of Stress Management* 12:409–23.

- Douglas, E., and D. Shepherd. 2002. "Self-Employment as a Career Choice: Attitudes, Entrepreneurial Intentions, and Utility Maximization." *Entrepreneurship Theory and Practice* 26(3):81–90.
- Dunkelberg, W. C., and A. C. Cooper. 1982. "Entrepreneurial Typologies: An Empirical Study." In *Frontiers of Entrepreneurship Research*, edited by K. H. Vesper, 1–15. Wellesley, MA: Babson College.
- Fishbein, M., and I. Ajzen. 1975. *Belief, Attitude, Intention and Behavior: An Introduction to Theory and Research*. New York: Addison-Wesley.
- Fredrickson, B. L., M. M. Tugade, C. E. Waugh, and G. R. Larkin. 2003. "What Good Are Positive Emotions in Crises? A Prospective Study of Resilience and Emotions Following the Terrorist Attacks on the United States on September 11th, 2001." *Journal of Personality and Social Psychology* 84:365–76.
- Gomez-Mejia, L. R., and D. B. Balkin. 1989. "Effectiveness of Individual and Aggregate Compensation Strategies." *Industrial Relations* 28(3):431–45.
- Harter, J. K., F. L. Schmidt, and C. L. M. Keyes. 2003. "Well-Being in the Workplace and Its Relationship to Business Outcomes: A Review of the Gallup Studies." In *Flourishing, Positive Psychology and the Life Well-Lived*, edited by C. L. M. Keyes and J. Haidt, 205–224. Washington, DC: American Psychological Society.
- Kahneman, D., and A. Tversky. 1979. "Prospect Theory: An Analysis of Decision under Risk." *Econometrica* 47:263–91.
- Knight, F. H. 1921. *Risk, Uncertainty, and Profit*. New York: Houghton Mifflin.
- Krueger, J. N. F., M. D. Reilly, and A. L. Carsrud. 2000. "Competing Models of Entrepreneurial Intentions." *Journal of Business Venturing* 15:411–32.
- Lee, L., P. K. Wong, M. Foo, and A. Leung. 2011. "Entrepreneurial Intentions: The Influence of Organizational and Individual Factors." *Journal of Business Venturing* 26:124–36.
- Lopes, L. L. 1996. "When Time Is of the Essence: Averaging, Aspiration, and the Short Run." *Organizational Behavior and Human Decision Processes* 65(3):179–89.
- Lowry, P. B., and J. Gaskin. 2014. "Partial Least Squares (PLS) Structural Equation Modeling (SEM) for Building and Testing Behavioral Causal Theory: When to Choose It and How to Use It." *IEEE Transactions on Professional Communication* 57(2), 123–146.
- MacCrimmon, K. R., and D. A. Wehrung. 1986. *Taking Risks: The Management of Uncertainty*. New York: Free Press.
- McClelland, D. C. 1961. *The Achieving Society*. Princeton, NJ: Van Nostrand.
- McClelland, D. C. 1965. "Need Achievement and Entrepreneurship: A Longitudinal Study." *Journal of Personality and Social Psychology* 1:389–92.
- Miller, K. D. 2007. "Risk and Rationality in Entrepreneurial Processes." *Strategic Entrepreneurship Journal* 1:57–74.
- Mischel, W. 1968. *Personality and Assessment*. New York: Wiley.
- Nunnally, J. C. 1978. *Psychometric Theory*. New York: McGraw-Hill.
- Palich, L. E., and D. R. Bagby. 1995. "Using Cognitive Theory to Explain Entrepreneurial Risk-Taking: Challenging Conventional Wisdom." *Journal of Business Venturing* 10(6):425–38.
- Ryff, C. D. 1989. "Happiness Is Everything, or Is It? Explorations on the Meaning of Psychological Well-Being." *Journal of Personality and Social Psychology* 57:1069–81.
- Ryff, C. D. 1995. "Psychological Well-Being in Adult Life." *Current Directions in Psychological Science* 4:99–104.
- Ryff, C. D., and C. L. M. Keyes. 1995. "The Structure of Psychological Well-Being Revisited." *Journal of Personality and Social Psychology* 69(4):719–27.

- Sarasvathy, D. K., H. A. Simon, and L. Lave. 1998. "Perceiving and Managing Business Risks: Differences between Entrepreneurs and Bankers." *Journal of Economic Behavior and Organization* 33:207–25.
- Shapero, A. 1982. "Social Dimensions of Entrepreneurship." In *The Encyclopedia of Entrepreneurship*, edited by C. A. Kent, D. Sexton, and K. H. Vesper, 72–90. Englewood Cliffs: Prentice-Hall.
- Shelley, M. K. 1994. "Gain/Loss Asymmetry in Risky Intertemporal Choice." *Organizational Behavior and Human Decision Processes* 59:124–59.
- Shepherd, D., and J. M. Haynie. 2009. "Birds of a Feather Don't Always Flock Together: Identity Management in Entrepreneurship." *Journal of Business Venturing* 24:316–37.
- Shinnar, R. S., O. Giacomini, and F. Janssen. 2012. "Entrepreneurial Perceptions and Intentions: The Role of Gender and Culture." *Entrepreneurship Theory and Practice* May:465–93.
- Sitkin, S. B., and A. L. Pablo. 1992. "Reconceptualizing the Determinants of Risk Behavior." *Academy of Management Review* 17(1):9–38.
- Sitkin, S. B., and L. R. Weingart. 1995. "Determinants of Risky Decision-Making Behavior: A Test of the Mediating Role of Risk Perceptions and Propensity." *Academy of Management Journal* 38(6):1573–92.
- Siu, W., and E. S. Lo. 2013. "Cultural Contingency in the Cognitive Model of Entrepreneurial Intention." *Entrepreneurship Theory and Practice* 37(2):147–73.
- Smith, N. R., and J. B. Miner. 1983. "Type of Entrepreneur, Type of Firm, and Managerial Motivation: Implications for Organizational Life Cycle Theory." *Strategic Management Journal* 4:325–40.
- Uy, M. A., M. Foo, and Z. Song. 2013. "Joint Effects of Prior Start-up Experience and Coping Strategies on Entrepreneurs' Psychological Well-Being." *Journal of Business Venturing* 28:583–97.
- Vlek, C., and P. J. Stallen. 1980. "Rational and Personal Aspects of Risk." *Acta Psychologica* 45:273–300.
- Wicker, A. W. 1969. "Attitudes versus Actions: The Relationship of Verbal and Over Behavioral Responses to Attitude Objects." *Journal of Social Issues* 25:41–78.
- Zhao, H., S. E. Seibert, and G. E. Hills. 2005. "The Mediating Role of Self-Efficacy in the Development of Entrepreneurial Intentions." *Journal of Applied Psychology* 90(6):1265–72.