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MANAGEMENT | RESEARCH ARTICLE

Which psychological characteristics strengthen “The entrepreneurial intention-action relationship”? An extension of the theory of planned behavior

Denny Bernardus¹, Fulgentius Danardana Murwani^{2*}, Elia Ardyan³, Liestya Padmawidjaja¹, Imanuel Deny Krisna Aji¹, Stefan Yudana Jatipewira¹, Djoko Dwi Kusumojanto², Cipto Wardoyo² and Yustinus Budi Hermanto³

Abstract: This study extends the literature of the theory of planned behavior in the context of entrepreneurship. Specifically, this study is intended to verify which psychological characteristics moderate the relationship between entrepreneurial intention and entrepreneurial action. Internal locus of control, innovativeness, and performance goal orientation are proposed to moderate “the entrepreneurial intention-action relationship”, because those variables have the likelihood for individuals to take action to start a new business. Adopting a cross-sectional design, the data were collected from 188 undergraduate students who participated in an entrepreneurship project and analyzed using hierarchical regression analysis. The results demonstrated that internal locus of control was found to strengthen “the entrepreneurial intention-action relationship”, whereas innovativeness and performance goal orientation did not moderate that relationship. The findings provide

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PUBLIC INTEREST STATEMENT

This study attempts to verify the relationship between entrepreneurial intention and entrepreneurial action. Entrepreneurial intention refers to a person's conscious state of mind for starting a business; whereas starting a business is a concrete form of entrepreneurial action. We find that entrepreneurial intention is a starting point for starting a business. However, past studies found that entrepreneurial intention may not be transformed automatically into entrepreneurial action. Hence, this study also attempts to test which psychological characteristics may strengthen the relationship between entrepreneurial intention and entrepreneurial action. As the result, we find that internal locus of control may strengthen a person to transform his/her entrepreneurial intention into his/her entrepreneurial action. In addition, internal locus of control itself refers to a person's belief that he/she can control his/her business.



practical implications not only for entrepreneurs to consider internal locus of control and entrepreneurial intention in starting a business, but also for entrepreneurship educators in developing a start-up business curriculum based on students' psychological characteristics.

Subjects: Individual Differences/IQ; Creativity; Educational Psychology; Entrepreneurship

Keywords: entrepreneurial intention-action link; internal locus of control; innovativeness; performance goal orientation

1. Introduction

During the past few decades, entrepreneurship has been an important topic in the fields of the economic and social sciences among researchers around the world (Karimi et al., 2016). Economists generally believe that the level of economic growth and innovation will be higher for a country with a higher level of entrepreneurship compared to the one with a lower level (Chen et al., 2015; Sánchez, 2013). Furthermore, starting a new business is a key element for fostering entrepreneurship (Volery et al., 2013), in terms of promoting innovation as well as generating economic growth (Chen et al., 2015; Wang et al., 2005).

Entrepreneurship is defined as "the processes of discovery, evaluation, and exploitation of opportunities" (p. 218), "in which new goods, services, raw materials, and organizing methods can be introduced" (Shane & Venkataraman, 2000, p. 220). Referring to Shane and Venkataraman (2000) definition, entrepreneurship studies are thereby interested to explain individuals in recognizing potential opportunities (Baum et al., 2007), i.e., discovering, evaluating, and exploiting them (Shane & Venkataraman, 2000) for successful new venture creation (Baum et al., 2007). The process of creating a new venture is carried out through the behaviors of individuals in start-up activities (Shirokova et al., 2018). Therefore, the greater the start-up activities undertaken by individuals, the greater the likelihood of new venture creations will be (Shirokova et al., 2018).

In the context of a new venture creation, entrepreneurship study is not limited in explaining the intention to begin start-up activities (Kautonen et al., 2015). Moreover, the study is about intentional and planned behavior (Karimi et al., 2016; Kautonen et al., 2015), i.e., starting a new business (Moriano et al., 2012), rather than mere intention (Kautonen et al., 2015). Therefore, entrepreneurship simply discusses "the intention-behavior relationship" (Kautonen et al., 2015), in which intention is considered as a good predictor of behavior (Ajzen, 1991; Karimi et al., 2016; Kautonen et al., 2015; Van Gelderen et al., 2015). However, past studies (Shirokova et al., 2016; Van Gelderen et al., 2015) highlight discrepancy between intention and behavior by tracing which variables moderate "the intention-behavior relationship". This study is intended not only to verify "the intention-behavior relationship", but also to test which variables strengthen "the intention-behavior relationship".

The structure of this paper proceeds as follows: following the introduction, we start by presenting the theory and hypotheses; we then continue by discussing our method, which is followed by a presentation of our results; subsequently, we discuss our findings, as well as **the implications and limitations of our research**.

2. Theory and hypotheses

2.1. The extended theory of planned behavior

We use the theory of planned behavior as a basis of conceptual framework. The theory of planned behavior postulates that attitude, subjective norm, and perceived behavioral control positively influence behavior, but these influences are mediated by intention (Ajzen, 1991). Therefore, "intention has three cognitive antecedents" (Kautonen et al., 2015, p. 656): attitude refers to

"the degree to which a person has a favorable or unfavorable evaluation or appraisal of the behavior in question" (Ajzen, 1991, p. 188); subjective norm refers to "the **perceived social pressure to perform or not to perform** the behavior" (Ajzen, 1991, p. 188); perceived behavioral control refers to "the perceived ease or difficulty of performing the behavior" (Ajzen, 1991, p. 188). Furthermore, the previously mentioned intention, for this case, refers to "the motivational factor that influence a behavior" (Ajzen, 1991, p. 181), which has a direct positive influence on behavior (Ajzen, 1991), in which behavior or action is the focus for individuals to be engaged (Kautonen et al., 2015).

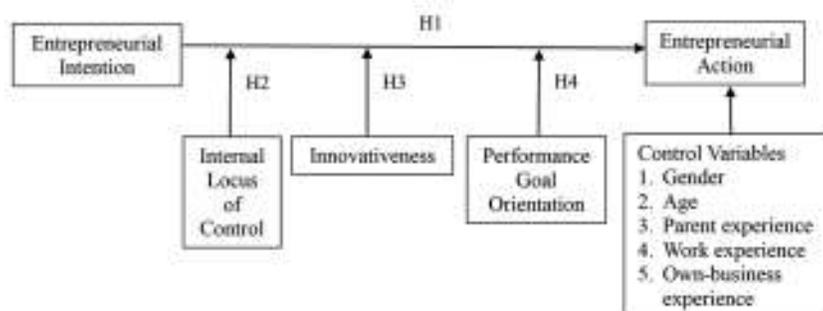
In the theory of planned behavior, however, there is "the intention-action gap", because not every intention is eventually translated into action (Kautonen et al., 2015; Shirokova et al., 2016; Van Gelderen et al., 2015). Even, "the intention-action gap" is mainly due to individuals who fail to translate their intentions into action, rather than individuals who carry out action that are not really initiated by their intentions (Norman & Conner, 2005). Simply, a small number of individuals act on their intentions, whereas the others do not (Van Gelderen et al., 2015). In addition, the study conducted by Van Gelderen et al. (2015) found that 69% of the prospective entrepreneurs fail to follow up their intentions to start a new business. Moreover, past studies (Kautonen et al., 2015; Shirokova et al., 2016; Van Gelderen et al., 2015) have verified that gap in the entrepreneurship context, in terms of "the entrepreneurial intention-action gap".

This study is intended to take part in examining how to bridge that gap. Specifically, this study focuses on testing which variables moderate the relationship between entrepreneurial intention and entrepreneurial action. Internal locus of control, innovativeness, and performance goal orientation, as the psychological characteristics (e.g., Dinis et al., 2013; Koh, 1996), are proposed to moderate the relationship between entrepreneurial intention and entrepreneurial action. Therefore, the extended theory of planned behavior focuses on the relationship between entrepreneurial intention (independent variable) and entrepreneurial action (dependent variable), in which the relationship is moderated by these three proposed moderator variables. These variables have the likelihood for individuals to take action, i.e., starting a new business. Thus, they may motivate individuals to translate their entrepreneurial intentions into entrepreneurial actions. The proposed conceptual model of the study is summarized in Figure 1.

2.2. Entrepreneurial intention and action link

Referring to the theory of planned behavior, entrepreneurial intention can be defined as the individual's deciding factor (Ajzen, 1991; Moriano et al., 2012) or the individual's conscious state of mind for performing planned entrepreneurial behavior (Moriano et al., 2012; Obschonka et al., 2010), such as starting a new business (Moriano et al., 2012). Entrepreneurial intention not only precedes entrepreneurial action, but also directs an individual toward starting a new business (Moriano et al., 2012). In brief, entrepreneurial intention can be defined operationally as "the commitment to starting a new business" (Krueger, 1993, p. 7).

Figure 1. The Proposed Conceptual Model.



According to the theory of planned behavior, there is a link between entrepreneurial intention and entrepreneurial action, in which it suggests that the stronger the intention to perform a planned entrepreneurial behavior (i.e., starting a new business) is the higher the likelihood of its effective performance (Ajzen, 1991; Mariano et al., 2012). However, the strength of entrepreneurial intention in influencing entrepreneurial action varies among previous studies. Meta-analysis by Sheeran (2002) showed that, on average, the percentage of the total variation in action explained by intention is 28%. Similarly, past studies, for example, by Norman and Conner (2005), Li and Chan (2008), Kautonen et al. (2015), Van Gelderen et al. (2015), Jahnmark et al. (2016), and Shirokova et al. (2016), showed that the explained variations in action by intention were 36%, 40.96%, 29.16%, 12.25%, 30%, and 9.85%, respectively. On the basis of these considerations, we propose the first hypothesis:

H1. *Entrepreneurial intention positively influences entrepreneurial action.*

2.3. Internal locus of control as a moderator

Mueller and Thomas (2001) emphasized that Rotter (1966) has made a significant contribution to entrepreneurship research by the first introducing a construct of locus of control. Locus of control is a personality attribute (Phillips & Gully, 1997) representing the degree to which an individual generally believes that his/her outcome is dependent on internal control of reinforcement (internal locus) or outside the control of an individual (external locus; Dinis et al., 2013; Mueller & Thomas, 2001; Phillips & Gully, 1997; Rotter, 1966). Individuals who have high internal locus of control will have low external locus of control, and vice versa (Mueller & Thomas, 2001; Rotter, 1966). "People with an external locus of control may be more passive", whereas internally controlled people may be more active (Rauch & Frese, 2007, p. 52).

Internal locus of control reinforces individuals to have a positive entrepreneurial attitude (Dinis et al., 2013) and a motivation to accomplish a goal (Rauch & Frese, 2007). Thus, individuals with high internal locus of control will have a higher entrepreneurial attitude and a higher motivation to accomplish a goal. Therefore, they accomplish a goal, i.e., starting a new business (Mariano et al., 2012), by relying more on their own control rather than the control of others (Dinis et al., 2013; Phillips & Gully, 1997), which means relying on the individual's own ability, effort, and even positive entrepreneurial attitude. Whereas the control of others refers to other people's efforts or a luck (Dinis et al., 2013). In addition, the stronger the internal locus of control, the higher the likelihood that an individual will take action to accomplish the individual's goal (Mueller & Thomas, 2001). This leads us to propose the second hypothesis:

H2. *The positive relationship between entrepreneurial intention and entrepreneurial action will be stronger for students with a higher score on internal locus of control compared to the ones with a lower score (or with a higher score on external locus of control).*

2.4. Innovativeness as a moderator

Innovativeness refers to the "tendency to be creative in thought and action" (The Jackson Personality Inventory Manual, in Mueller & Thomas, 2001, p. 63), including thinking outside the box to recognize the opportunities (Jahnmark et al., 2016). Specifically, there are two different constructs of innovativeness: general and domain-specific innovativeness (Marcati et al., 2008). General innovativeness relates not only to creativity of individuals, but also to "their readiness to follow new ways" (Marcati et al., 2008, p. 1580). Domain-specific innovativeness refers to the speed of individuals in adopting innovations in a specific domain (Marcati et al., 2008), such as starting a business in new ways (Dinis et al., 2013). Thus, innovativeness plays an important role in starting a new business (Dinis et al., 2013; Mueller & Thomas, 2001).

As starting a business in a new way is innovative (Dinis et al., 2013), the speed of individuals in starting a business (Marcati et al., 2008) plays an important role in determining whether or not the business will be successfully started. Dinis et al. (2013, p. 767) emphasized that entrepreneurs who start a new business "are significantly more innovative than non-entrepreneurs". Individuals with high innovativeness can also strongly encourage the business creation and the business success (Rauch & Frese, 2007). Therefore, the stronger the innovativeness of individuals, the higher the likelihood of their success in starting a business. Given the above premise, we propose the third hypothesis:

H3. The positive relationship between entrepreneurial intention and entrepreneurial action will be positively moderated by students' innovativeness.

2.5. Performance goal orientation as a moderator

Goal orientation refers to "the reasons why, the student is participating in the task, e.g., Why am I doing this?" (Pintrich et al., 1991, p. 11). Two forms of goal orientations are performance goal orientation [or extrinsic goal orientation] and mastery goal orientation [or intrinsic goal orientation] (Lüftenegger et al., 2014; Pintrich et al., 1991, 1993). When the student has high-performance goal orientation, participating in a task is "a means to an end" (Pintrich et al., 1991, p. 9) or "a focus on grades and approval from others" (Pintrich et al., 1993, p. 802) or "a focus on demonstrating competence and ability in comparison to others" (Lüftenegger et al., 2014, p. 452) or a focus on "attaining normative competence and attends to external requirements for success" (Uy et al., 2017, p. 447). Conversely, the central emphasis for mastery goal orientation is "an end all" to participating in a task (Pintrich et al., 1991, p. 9) or "a focus on learning and mastery" (Pintrich et al., 1993, p. 802) or "a focus on learning, developing new skills, improving the level of competence and trying to understand new learning subjects" (Lüftenegger et al., 2014, p. 452).

Lüftenegger et al. (2014) explained that although performance goal orientation shows lower motivational patterns than mastery goal orientation, it is still positively related to performance. In addition, past studies (Elliot & McGregor, 2001; Elliot & Murayama, 2008) showed that performance goal orientation was a significant predictor of performance, whereas mastery goal orientation was not significant. Performance goal orientation focuses on performing the goal (Fisher et al., 2013), whereas mastery goal orientation tends to focus on learning (Elliot & Murayama, 2008; Lüftenegger et al., 2014). Hence, the focus of this study is on performance goal orientation. Further, we theorize that individuals with an entrepreneurial intention will likely to strongly influence their entrepreneurial action (Ajzen, 1991; Mariano et al., 2012) only if they have high levels of performance goal orientation, because they really seek to demonstrate their competence and ability (Fisher et al., 2013; Lüftenegger et al., 2014) for starting a new business. Individuals with a strong performance goal orientation will not only focus on proven strategies to achieve a successful performance, but also prefer to engage in starting a new business (Uy et al., 2017). Therefore, we propose the last hypothesis:

H4. The positive relationship between entrepreneurial intention and entrepreneurial action will be stronger for students with a higher score on performance goal orientation compared to the ones with a lower score.

3. Method

3.1. Respondents

We used a cross-sectional design to collect data from respondents. The respondents were undergraduate students of Universitas Ciputra Surabaya, Indonesia, who participated in an entrepreneurship project organized by that university. The questionnaires were distributed to 250 students,

but 62 respondents were found inconsistent in completing the questionnaires. Therefore, 188 respondents were retained for further analysis. Male respondents were 51 (27.1%), whereas female respondents were 137 (72.9%). There were 157 students (83.5%), whose parents manage their own business.

3.2. Measures

3.2.1. Internal locus of control

We assessed respondents' internal locus of control using a 4-item scale taken from Mueller and Thomas (2001). We then called this scale as the Mueller-Thomas Internal Locus of Control Scale (MT-ILCS). A sample item is "My life is determined by my own actions." Respondents were asked to indicate their agreement on a five-point scale (1 = strongly disagree, 5 = strongly agree). Total scores were calculated by summing the four items. Higher scores indicate more internal locus of control, and lower scores indicate more external locus of control (Mueller & Thomas, 2001; Rotter, 1966). Cronbach's alpha for the MT-ILCS was 0.79.

3.2.2. Innovativeness

Innovativeness was assessed using an eight-item scale taken from Mueller and Thomas (2001). We then called this scale as the Mueller-Thomas Innovativeness Scale (MT-IS). The MT-IS includes eight items, such as "I often surprise people with my novel ideas." Responses to eight items were made on a five-point scale (1 = strongly disagree, 5 = strongly agree). Total scores were calculated by summing the eight items. Higher scores indicate more innovativeness. Cronbach's alpha for the MT-IS was 0.73.

3.2.3. Performance goal orientation

We assessed respondents' performance goal orientation using a 4-item scale taken from Pintrich et al. (1991). We then called this scale as the Pintrich-Smith-Garcia-McKeachie Performance Goal Orientation Scale (PSGM-PGOS). A sample item is "Getting a good grade in this class is the most satisfying thing for me right now." Respondents were asked to indicate their agreement on a five-point scale (1 = strongly disagree, 5 = strongly agree). Total scores were calculated by summing the four items. Higher scores indicate more performance goal orientation (Elliot & McGregor, 2001; Elliot & Murayama, 2008; Lüftenegger et al., 2014; Pintrich et al., 1991, 1993). Cronbach's alpha for the PSGM-PGOS was 0.80.

3.2.4. Entrepreneurial intention

Entrepreneurial intention was assessed using a 6-item scale taken from Liñán and Chen (2009). We then called this scale as the Liñán-Chen Entrepreneurial Intention Scale (LC-EIS). The LC-EIS includes six items, such as "I am ready to do anything to be an entrepreneur." Responses to six items were made on a five-point scale (1 = strongly disagree, 5 = strongly agree). Total scores were calculated by summing the six items. Higher scores indicate more entrepreneurial intention. Cronbach's alpha for the LC-EIS was 0.91.

3.2.5. Entrepreneurial action

Following Shirokova et al. (2016), entrepreneurial action was measured as "the index reflecting the scope of start-up activities that a student has already carried out on his or her way to the new venture creation" (p. 391). Referring to previous studies (Edelman et al., 2008, 2016; Shirokova et al., 2016), the scope of start-up activities was adopted from Panel Study of Entrepreneurial Dynamics (PSED) and includes 26 items taken from Edelman et al. (2008). A sample item is "Defined market opportunities/customers, competitors." Respondents had to answer 26 yes-or-no-questions about start-up activities. Based upon a "Yes" or "No" response, an index was assessed by summing the "Yes" responses (Edelman et al., 2016; Shirokova et al., 2016). Higher scores indicate more entrepreneurial action.

3.2.6. Control variables

We included gender (dummy variable, coded as 1 for male and 0 for female) as a control variable (Edelman et al., 2016; Shirokova et al., 2018; Volery et al., 2013). Social psychology perspective argues that men and women are different in socialization experiences, which in turn leads to different approaches and motivations when starting a venture (Monolova et al., 2008, 2007). Men are more likely to start a new business than women (Reynolds, 1997; Volery et al., 2013).

Age (self-reported year of birth) was also included as a control variable (Edelman et al., 2016; Shirokova et al., 2018; Volery et al., 2013). "Older students have more human-capital assets" (Volery et al., 2013, pp. 435–436), which in turn leads to more possibilities to set up a venture (Reynolds, 1997).

Finally, we considered prior entrepreneurial exposure as a control variable (Edelman et al., 2016; Shirokova et al., 2018; Volery et al., 2013). We adapted the three types of prior entrepreneurial exposure from Knueger (1993): parent experience (dummy variable, coded as 1 if at least one parent had been self-employed, and 0 otherwise), work experience (dummy variable, coded as 1 if respondent reported a professional experience, and 0 otherwise), and own-business experience (dummy variable, coded as 1 if respondent had started a business, and 0 otherwise). Social learning theory explains "the effect of behavior acquisition through the observation of others referred to as role models. Naturally, children are especially exposed to their parents' behaviors" (Zapkau et al., 2015, p. 641). Thus, their parents' experiences as self-employed persons shape their mental model (Zapkau et al., 2015), which in turn more possibility for them to set up a venture. Further, "... 'past behavior is the best predictor of future behavior' has considerable popular belief" (Carr & Sequeira, 2007, p. 1092). Prior work experience is likely to influence individuals' entrepreneurial work attitude and entrepreneurial lifestyle (Zapkau et al., 2015) as well as prior own-business experience. Such experiences allow individuals more possibility for starting a business.

3.3. Data analysis

We used a four-step hierarchical regression analysis to assess the moderating effect of internal locus of control, innovativeness, and performance goal orientation on the entrepreneurial intention and entrepreneurial action relationship. Initially at step 1, we entered five control variables, followed by step 2, which is adding entrepreneurial intention as a focal independent variable. At step 3, the three moderator variables were also added. At the final step, we added the interaction terms to assess the moderating effect of internal locus of control, innovativeness, and performance goal orientation on the entrepreneurial intention and entrepreneurial action relationship. As recommended by previous authors (Cronbach, 1987; Jaccard & Turrisi, 2003; Lewis-Beck & Lewis-Beck, 2016), we used mean-centered score for each component of an interaction term to avoid collinearity between an interaction term and its component. For example, collinearity between (entrepreneurial intention x internal locus of control) and entrepreneurial intention, and between (entrepreneurial intention x internal locus of control) and internal locus of control.

4. Results

4.1. Descriptive statistics and intercorrelations of variables

Table 1 presents the means and standard deviations of continuous variables as well as the frequencies and percentages of categorical variables. On average of continuous variables except entrepreneurial action, the score of each item is above 3.0 (measured on a five-point scale). For example, the average score of each item of entrepreneurial intention is 3.98 ($= 23.87 \div 6$). On average, the score of entrepreneurial action is 17.92. The average score of entrepreneurial action relatively tends to close the maximum score of 26. Overall of categorical variables, above 50% of respondents have own-business experience and have self-employed parent, whereas under 50% of respondents are male and have work experience.

Table 1. Descriptive Statistics (n = 188)

Variables	Mean	Standard Deviation	Minimum	Maximum	Categories	Frequency (Percent) ^a
Dependent Variable						
Entrepreneurial Action	17.92	3.73%	6	26		
Control Variables						
Age	19.44	1.22%	17	24		
Gender	-	-	0	1	Male	51 (27.11)
Parent experience	-	-	0	1	Self-employed	157 (83.5)
Work experience	-	-	0	1	Yes	79 (42.01)
Own-business experience	-	-	0	1	Yes	140 (74.5)
Focal Independent Variable						
Entrepreneurial Intention	23.87	4.010	12	30		
Moderators						
Internal Locus of Control	16.72	2.315	8	20		
Innovativeness	29.26	4.029	16	40		
Performance Goal Orientation	15.80	2.59%	8	20		

^aFrequencies and percentages were computed only for categorical variables instead of computing their means and standard deviations (Ferguson, 1976; Guilford & Fruchter, 1973).

Table 2 presents intercorrelations of variables. There are positive and significant correlations between entrepreneurial intention and entrepreneurial action, and between the three moderator variables and entrepreneurial action. These results support the role of entrepreneurial intention as an independent variable, and internal locus of control, innovativeness, and performance goal orientation as moderator variables. According to Tuckman and Harper (2012), those moderator variables perform function as the secondary independent variables.

4.2. Test of hypotheses

As shown in Table 3, all control variables were not significant predictors of entrepreneurial action, whereas a constant was significant (at step 1). At step 2, the main effect of entrepreneurial intention on entrepreneurial action was significant, whereas both all control variables and a constant were not significant. The total variance explained by the model became 23.5% with a significant increment in R^2 (ΔR^2) about 19.8% ($p < 0.01$). Further, the main effect of entrepreneurial intention on entrepreneurial action was significant, whereas all control variables, all moderator variables, and a constant were not significant (at step 3). The total variance explained by the model became 24.9% but the ΔR^2 was not significant. Finally, the moderating effects of internal locus of control were significant, whereas the main effect was not moderated by innovativeness and performance goal orientation (at step 4). At this step, all control variables, all moderator variables, and a constant were not significant. In addition, the total variance explained by the model became 41.8% with the ΔR^2 about 16.9% ($p < 0.01$).

According to the results presented in Table 3, we found support for our Hypothesis 1 that entrepreneurial intention positively and significantly influences entrepreneurial action. Supporting our Hypothesis 2, the result shows that internal locus of control moderates the positive relationship between entrepreneurial intention and entrepreneurial action. That is, the positive relationship between entrepreneurial intention and entrepreneurial action is stronger when students have high rather than low internal locus of control. Contrary to our Hypothesis 2, we found that innovativeness and performance goal orientation do not moderate the positive relationship between entrepreneurial intention and entrepreneurial action. Hence, our Hypothesis 3 and Hypothesis 4 are not supported.

In order to explain how internal locus of control moderates the positive relationship between entrepreneurial intention and entrepreneurial action, we used a graphical depiction of the main effects of entrepreneurial intention and internal locus of control and the interaction on entrepreneurial action. We then followed the hand computation demonstrated by Jose (2013). As a result of hand computation (Jose, 2013), we produced the mean entrepreneurial action scores across low/high internal locus of control and low/high entrepreneurial intention as shown in Table 4. Based on four means in Table 4, we then plotted a graphical depiction as shown in Figure 2. High internal locus of control is indicated by the top line (bold line), whereas low internal locus of control is indicated by the bottom line (dash line). High and low internal locus of control are 1 SD above the mean and 1 SD below the mean, respectively.

Simple slope analysis of moderation lines (Jose, 2013) in Figure 2 was conducted to verify whether the significant interaction effect was consistent with our Hypothesis 2. In order to conduct simple slope analysis, we followed the hand computation demonstrated by Jose (2013). Based on simple slope analysis, the two lines in Figure 2 show that the positive relationship between entrepreneurial intention and entrepreneurial action was stronger ($b = 1.68$, $SE = 0.54$, t -value = 3.11, $p < 0.01$) when the internal locus of control was high (1 SD above the mean), whereas that positive relationship was weaker ($b = 1.38$, $SE = 0.41$, t -value = 3.37, $p < 0.01$) when the internal locus of control was low (1 SD below the mean).

5. Discussion

Consistent with the previous research findings (Kautonen et al., 2015; Li & Chan, 2008; Norman & Conner, 2005; Sheeran, 2002; Shirakova et al., 2016; Van Gelderen et al., 2015), our study found that

Table 2. Intercorrelations of Variables (n = 188)

No.	Variables	1	2	3	4	5	6	7	8	9	10
1	Entrepreneurial Action	1.000									
2	Gender	0.058	1.000								
3	Age	0.000	0.044	1.000							
4	Parent experience	0.161*	-0.116	-0.015	1.000						
5	Work experience	0.021	0.038	0.307	0.059	1.000					
6	Own-business experience	0.128*	-0.109	0.062	0.200**	0.152*	1.000				
7	Entrepreneurial Intention	0.470**	0.035	0.081	0.089	0.090	0.170*	1.000			
8	Internal Locus of Control	0.283**	0.059	0.093	0.113	0.043	-0.024	0.499**	1.000		
9	Innovativeness	0.274**	-0.074	-0.055	0.043	0.021	-0.063	0.382**	0.610**	1.000	
10	Performance Goal Orientation	0.257**	-0.119	-0.172**	0.082	0.067	0.006	0.443**	0.529**	0.513**	1.000

*p < 0.05; **p < 0.01.

Table 3. Hierarchical Linear Regression on Entrepreneurial Action (n = 188)

	Step 1	Step 2	Step 3	Step 4
<i>Control Variables</i>				
Gender	0.719	0.497	0.636	0.829
Age	-0.026	-0.050	-0.014	-0.317
Parent experience	1.285	0.997	0.980	0.973
Work experience	-0.046	-0.106	-0.147	-0.048
Own-business experience	0.970	0.352	0.510	0.916
<i>Focal Independent Variable</i>				
Entrepreneurial Intention	-	0.422**	0.373**	0.442**
<i>Moderator Variables</i>				
Internal Locus of Control	-	-	-0.031	0.107
Innovativeness	-	-	0.117	0.068
Performance Goal Orientation	-	-	0.034	0.068
<i>Moderating Effects ^a</i>				
Entrepreneurial Intention x Internal Locus of Control	-	-	-	0.065*
Entrepreneurial Intention x Innovativeness	-	-	-	0.027
Entrepreneurial Intention x Performance Goal Orientation	-	-	-	0.035
Constant	16.460**	7.636	4.537	6.334
F	1.415	9.285**	6.550**	10.462**
R Square	0.037	0.235	0.249	0.418
R Square Change	-	0.198**	0.013	0.169**

*p < 0.05; **p < 0.01.

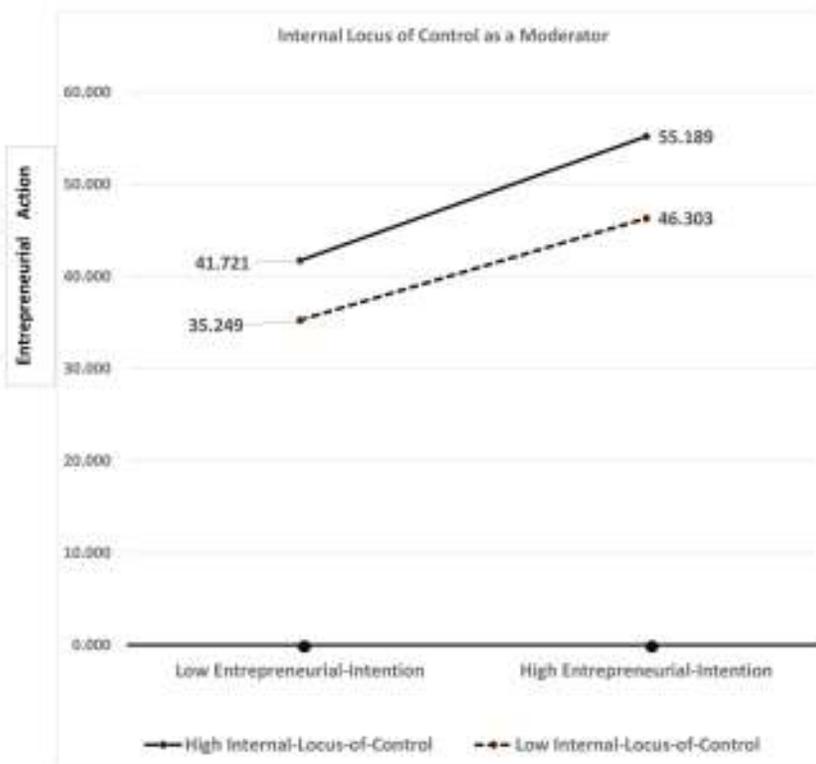
^aAs recommended by previous authors (Cronbach, 1987; Jaccard & Turisi, 2003; Lewis-Beck & Lewis-Beck, 2016), the study used the mean-centered score of each component of an interaction term. For example, an interaction term of entrepreneurial intention and internal locus of control was computed based on the mean-centered scores of entrepreneurial intention and internal locus of control.

Table 4. Means Generated by Hand Computation (Jose, 2013) of the Main Effects of Entrepreneurial Intention and Internal Locus of Control and the Interaction on Entrepreneurial Action

	Low Entrepreneurial-Intention	High Entrepreneurial-Intention
High Internal-Locus-of-Control	41.721	55.189
Low Internal-Locus-of-Control	35.249	46.303

entrepreneurial intention is a good predictor of action to start a new business. The existence of a good predictor is supported by the relationship between entrepreneurial intention and entrepreneurial action in a short time frame rather than a long one (Van Gelderen et al., 2015). Therefore,

Figure 2. Relationship between Entrepreneurial Intention and Entrepreneurial Action at High and Low Levels of Internal Locus of Control.



entrepreneurial intention may be considered as the starting point of entrepreneurial action (Shirokova et al., 2016; Van Gelderen et al., 2015). Our study also found that the total variation in action to start a new business explained by entrepreneurial intention is about 22%. The explained variance found in our study is similar to the average of explained variances found in those previous studies, which is about 26%. Referring to Gujarati and Porter (2009) that the explained variance of 22% is categorized as relatively low. However, the relatively low categories are basically owned by studies with cross-sectional data as well as our study (Gujarati & Porter, 2009).

In our study, internal locus of control has been shown to strengthen the influence of entrepreneurial intention on entrepreneurial action. Our finding reinforces the relevance of the high internal locus of control that exceed the external locus of control (Mueller & Thomas, 2001; Rotter, 1966). We are then convinced that individuals with high internal locus of control may be able to encourage themselves to take action in order to achieve their goals themselves (Mueller & Thomas, 2001) based on their own abilities, efforts, and positive entrepreneurial attitudes (Dinis et al., 2013). Therefore, internal locus of control has a significant role as a moderator variable.

Furthermore, our study found that innovativeness is not able to be a moderator in entrepreneurial intention-action relationship. However, the relatively strong innovativeness found by this study (see Table 1 and Appendix) did not succeed in moderating that relationship. One possible explanation for this may relate to the existence of the individual-level analysis of innovativeness (Rauch & Frese, 2007), which is suspected to be the cause of the insignificant moderating effect of innovativeness. In the context of starting a new business, innovativeness cannot be implemented by one person alone, but it requires involvement of individuals at the organizational level (Rauch &

Frese, 2007). Previous studies (e.g., Augusto & Coelho, 2009; Brockman et al., 2012) found that innovativeness at the organizational level is significant in carrying out its role as a moderator variable. In addition, previous studies (e.g., Jackson et al., 2013; Yi et al., 2006) also found that innovativeness at the individual level is relevant for improving the work of individuals in an organization. However, that finding has an implication at the organizational level, in which the organizational managers should identify individuals who have strong innovativeness for supporting organizational tasks (Jackson et al., 2013).

Therefore, the strong innovativeness at the individual level may be called as a necessary condition, whereas the strong innovativeness at the organizational level may be called as a sufficient condition. For example, "people often ask me for help in creative activities" as an item at the individual level (Mueller & Thomas, 2001), it requires implementation at the organizational level, i.e., "management actively seeks innovative ideas" (Augusto & Coelho, 2009). Next, another item at the individual level, i.e., "I often surprise people with my novel ideas" (Mueller & Thomas, 2001) also requires implementation at the organizational level, i.e., "new ideas are rapidly accepted in this organization" (Augusto & Coelho, 2009).

Our study also found that performance goal orientation does not moderate the relationship between entrepreneurial intention and entrepreneurial action. As it is also found in innovativeness, however, the relatively strong performance goal orientation (see Table 1 and Appendix) did not succeed in moderating that relationship. One possible explanation is that individuals with a strong performance goal orientation tend to strongly demonstrate their competence by achieving success and avoiding failure (Culbertson et al., 2011; Domurath et al., 2020; Tanaka & Yamauchi, 2001; Uy et al., 2017). For starting a new business successfully (Mariano et al., 2012), they succeed not only to display their competencies, but also to avoid their incompetencies (Culbertson et al., 2011; Domurath et al., 2020; Tanaka & Yamauchi, 2001; Uy et al., 2017). Furthermore, starting a new business may be a choice for individuals to display their competencies (Fisher et al., 2013; Uy et al., 2017) as well as to avoid their failures (Uy et al., 2017). Referring to previous findings by Tanaka and Yamauchi (2001), however, the strong performance goal orientation has an implication for individuals' tendencies to experience anxiety as a result of displaying their competencies and avoiding their failures. Therefore, that condition encourages a relatively strong performance goal orientation with a tendency to experience anxiety, which may not moderate the relationship between entrepreneurial intention and entrepreneurial action.

5.1. Implications for research

This study extends the literature of the theory of planned behavior (Ajzen, 1991). Specifically, our study may help to bridge "the entrepreneurial intention-action gap" and extends the literature of the entrepreneurial intention-action relationship by verifying which psychological characteristics (e.g., Dinis et al., 2013; Koh, 1996) moderate the positive relationship between entrepreneurial intention and entrepreneurial action, in the entrepreneurship context of university. In that context, the entrepreneurial intention is an important predictor of entrepreneurial action. However, the presence of internal locus of control is really needed in order to strengthen the positive relationship between entrepreneurial intention and entrepreneurial action.

Although innovativeness and performance goal orientation do not have the moderating effects on the positive relationship between entrepreneurial intention and entrepreneurial action, the moderating effects of those two psychological characteristics are still possible to be verified for future studies. It is also suggested in those studies that there is a need to investigate the possibilities of a necessary condition of strong innovativeness at individual level as well as a tendency to experience anxiety of strong performance goal orientation. Even, as the study conducted by Shirokova et al. (2016), the control variables (e.g., gender, age, and past experiences) also have a possibility to be tested as the moderator variables. This is a future research agenda.

5.2. Implications for practice

As the study conducted by Shirokova et al. (2016), this study also has practical implications for entrepreneurs and entrepreneurship educators. Entrepreneurs pay attention primary to the entrepreneurial intention-action relationship, which relies on the entrepreneurial intention as the starting point (Shirokova et al., 2016; Van Gelderen et al., 2015). In addition, for entrepreneurs, our study shows the importance of internal locus of control that may strengthen individuals to move their entrepreneurial intentions to entrepreneurial actions.

For entrepreneurship educators who are interested in developing a start-up business for their students, our study provides a kind of guidance for developing an entrepreneurship curriculum. In the early semesters, entrepreneurship educators emphasize the development of psychological characteristics, i.e., internal locus of control and entrepreneurial intention. In the next semester, students are trained to develop creative ideas as well as how to be able to implement creative ideas into action to start a new business. Similar to Shirokova et al. (2016), our study also provides insights for entrepreneurship educators in mapping students who are suitable for developing a start-up business based on their internal locus of controls and entrepreneurial intentions.

5.3. Limitations and future research

The first limitation of our study is the cross-sectional design. This design allows us to verify the entrepreneurial intention-action relationship as well as what variables moderate the relationship between entrepreneurial intention and entrepreneurial action, at a certain point of time. However, the entrepreneurial intention-action relationship and the moderating effect of those variables do not indicate the cause-and-effect relationship (Tuckman & Harper, 2012). Therefore, the longitudinal design studies are needed to further understand the dynamic of the entrepreneurial intention-action relationship as well as the moderating effect of those variables. The longitudinal design studies can be conducted on students from the first to the sixth semesters.

Similar to what was suggested in previous studies (e.g., Li & Chan, 2008; Shirokova et al., 2016, 2018), we sampled undergraduate students as a single homogeneous group. Thus, generalizability of our findings to the wider population remains questionable. Future studies in this area might focus on the wider student population in order to achieve more heterogeneous subjects.

Authorship

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All authors also have made significant contribution to this article and approved it for publication. D.B., F.D.M., and E.A. reviewed the literature from previous studies. D.B. and F.D.M. conceptualized the study. All authors designed the study. L.P., I.D.K.A., S.Y.J., D.D.K., C.W., and Y.B.H. implemented the study. F.D.M., L.P., and I.D.K.A. analyzed data. F.D.M. and E.A. made the discussion and implications. D.B., F.D.M., E.A., and S.Y.J. drafted the manuscript. All authors read and corrected the manuscript. D.B. and F.D.M. coordinated the entire study.

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Appendix

The Appendix depicts the descriptive statistics of items used in this study. Due to a copyright reason, further information about the items of variables used in this study, please visit the following links:

Internal Locus of Control

Four items comprise the internal locus of control scale taken from the Mueller-Thomas Internal Locus of Control Scale [MT-ILCS] (Mueller & Thomas, 2001), <https://www.sciencedirect.com/science/article/abs/pii/S0883902699000397>.

Innovativeness

Eight items comprise the innovativeness scale taken from the Mueller-Thomas Innovativeness Scale [MT-IS] (Mueller & Thomas, 2001), <https://www.sciencedirect.com/science/article/abs/pii/S0883902699000397>.

Performance Goal Orientation

Four items comprise the performance goal

orientation scale taken from the Pintrich-Smith-Garcia-McKeachie Performance Goal Orientation Scale [PSGM-PGOS] (Pintrich et al., 1991), <https://files.eric.ed.gov/fulltext/ED338122.pdf>.

Entrepreneurial Intention

Six items comprise the entrepreneurial intention scale taken from the Liñán-Chen Entrepreneurial Intention Scale [LC-EIS] (Liñán & Chen, 2009), <https://journals.sagepub.com/doi/abs/10.1111/j.1540-6520.2009.00318.x>.

Entrepreneurial Action

Twenty six items comprise the entrepreneurial action scale taken from the Panel Study of Entrepreneurial Dynamics (Edelman et al., 2008), <https://www.jstor.org/stable/40214497> or

<https://journals.aom.org/doi/abs/10.5465/AMLE.2008.31413862>.

Original numbers	Codes in this study	Mean	Standard Deviation	Minimum	Maximum
4	MT-ILCA	4.26	0.730	2	5
5	MT-ILCS	4.34	0.645	2	5
7	MT-ILC7	4.07	0.756	2	5
9	MT-ILC9	4.05	0.826	2	5
	Total score	16.72	2.315	8	20

Original numbers	Codes in this study	Mean	Standard Deviation	Minimum	Maximum
1	MT_11	3.55	0.822	1	5
2	MT_12	3.66	0.883	1	5
3	MT_13	3.73	0.757	1	5
4	MT_14	3.77	0.750	2	5
5	MT_15	3.59	0.870	1	5
6	MT_16	3.78	0.878	1	5
7	MT_17	3.31	1.035	1	5
8	MT_18	3.85	0.814	2	5
	Total score	29.26	4.029	16	40

Original numbers	Codes in this study	Mean	Standard Deviation	Minimum	Maximum
7	PSGM_PGD7	4.01	.840	2	5
11	PSGM_PGD11	3.80	.826	2	5
13	PSGM_PGD13	4.01	.856	2	5
30	PSGM_PGD30	3.98	.767	2	5
	Total score	15.80	2.594	8	20

Original numbers	Codes in this study	Mean	Standard Deviation	Minimum	Maximum
18.a	LC_EI1	3.88	0.792	1	5
18.b	LC_EI2	3.82	0.907	1	5
18.c	LC_EI3	3.95	0.748	1	5
18.d	LC_EI4	4.13	0.749	1	5
18.e	LC_EI5	3.99	0.840	2	5
18.f	LC_EI6	4.10	0.761	2	5
	Total score	23.87	4.010	12	30

Original numbers	Codes in this study	Mean	Standard Deviation	Minimum	Maximum
1	Ent_Action1	0.97	0.176	0	1
2	Ent_Action2	0.79	0.407	0	1
3	Ent_Action3	0.93	0.254	0	1
4	Ent_Action4	0.88	0.322	0	1
5	Ent_Action5	0.94	0.245	0	1
6	Ent_Action6	0.84	0.372	0	1
7	Ent_Action7	0.55	0.499	0	1
8	Ent_Action8	0.90	0.302	0	1
9	Ent_Action9	0.76	0.428	0	1
10	Ent_Action10	0.60	0.492	0	1
11	Ent_Action11	0.47	0.500	0	1
12	Ent_Action12	0.79	0.407	0	1
13	Ent_Action13	0.44	0.498	0	1
14	Ent_Action14	0.78	0.418	0	1
15	Ent_Action15	0.58	0.495	0	1
16	Ent_Action16	0.37	0.485	0	1
17	Ent_Action17	0.79	0.407	0	1
18	Ent_Action18	0.75	0.434	0	1
19	Ent_Action19	0.44	0.497	0	1
20	Ent_Action20	0.82	0.386	0	1
21	Ent_Action21	0.84	0.480	0	1
22	Ent_Action22	0.59	0.493	0	1
23	Ent_Action23	0.76	0.428	0	1
24	Ent_Action24	0.62	0.487	0	1

(Continued)

Original numbers	Codes in this study	Mean	Standard Deviation	Minimum	Maximum
25	Ent_Action25	0.44	0.498	0	1
26	Ent_Action26	0.68	0.467	0	1
	Total score	17.92	3.734	6	26



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