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EDUCATIONAL ASSESSMENT & EVALUATION | RESEARCH ARTICLE

Developing a measurement instrument for high school students' entrepreneurial orientation

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Abstract: Business owners, especially successful ones, can be assumed to have eminently developed an entrepreneurial orientation ever since their high school days. However, thus far there is no standardized scale to specifically measure entrepreneurial orientation behavior in high school students. This study analyzes the dimensions of entrepreneurial orientation in 368 high school students in six major cities on the island of Java, Indonesia. Items of the scale are arranged based on five dimensions of entrepreneurial orientation by Lumpkin and Dess. The result of the exploratory analysis indicates four dimensions that are proven valid and reliable, namely innovativeness, risky proactiveness, autonomy, and competitiveness. However, the result of external validity test shows only three valid dimensions, hence leading to the exclusion of the autonomy dimension from this scale. This scale can be implemented by educators to identify and develop entrepreneurial orientation in high school students.

Subjects: Environment & Business; South East Asian Business; Multidisciplinary Psychology; Educational Psychology; Entrepreneurship

Keywords: entrepreneurial; high school; student; scale; adolescence

1. Introduction

Entrepreneurship education or business in higher education needs to be improved by developing education since K-12 general education (AlSagheer & Al-Sagheer, 2010). Entrepreneurship education is not only needed for vocational education but also for academic curriculum development in high schools to instill entrepreneurial values since youth (Cheung, 2016). The result of

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PUBLIC INTEREST STATEMENT

Entrepreneurship is a crucial tool in developing the prosperity of a country. Entrepreneurial orientation behavior in high school students can predict their career choices as business owners in the future. This study developed an entrepreneurial orientation measurement instrument that is suitable for the development stage of secondary school students. This instrument is useful for educators to identify and develop entrepreneurial orientation behaviors of their students.

a longitudinal study involving more than 9,000 US high school students proves that entrepreneurial orientation impacts career choices to become business owners ten years after graduating from high school (Saw & Schneider, 2012). Therefore, entrepreneurship education should be implemented and developed in high school. Entrepreneurship education in high schools can increase the long-term probability of students starting a business likewise their entrepreneurial income in 16 years after graduation (Elert, Andersson, & Wennberg, 2015). As such, it is necessary to measure the entrepreneurial orientation of high school students which may well reflect their career choices of becoming a business owner.

The initial concepts of measuring entrepreneurial orientation were done at the firm or organizational level instead of individual level. Miller and Friesen (1982) measured the entrepreneurial orientation of companies that had the grit to innovate regularly and take risks in their product-market strategies. The following year, the same scale was perfected by Miller (1983) who measured the involvement of firms in the innovation of both products and markets, by taking risky efforts and proactive actions to defeat competitors. Lumpkin and Dess (1996) developed an entrepreneurial orientation scale that measures the process, practice and decision-making activities of the firm that brings a new entry through one or more of five behavioral tendencies.

Entrepreneurial orientation scale was first developed for individuals by Covin and Slevin (1988) albeit from the perspective of firm leaders. Investigation on the entrepreneurial orientation scale has also been carried out on individuals who are potential business owners (Bolton, 2012). The investigation is a continuation of the development of an entrepreneurial orientation scale for university students (Bolton & Lane, 2012).

There is a dearth of past studies on entrepreneurial orientation have focused on high school students. This is perhaps due to the assumption that high school students are not ready to manage business ventures like business owners or university students. The learning models in high schools still implement a passive attitude so that they do not yet have enough skills to continue to college and must first follow a remedial (Santrock, 2012). This condition connotes that high school students are not ready to run a cohesive team project as usually carried out by university students, which are team projects considered relevant to the business venture (Bolton & Lane, 2012). University students' entrepreneurial motivation is more directly related to personal goals in developing business ventures or more intrinsic. While the entrepreneurial behavior of high school students is still less specific than university students, especially in non-vocational high schools. The entrepreneurial behavior of high school students is also still strongly influenced by the values and morals taught by their parents (Kusmulyono, 2017). The entrepreneurial motivation of high school students in Jakarta, Indonesia, are also more influenced by social norms from family, friends and significant others than by their internal locus of control (Purwana, Suhud, Fatimah, & Armelita, 2018). Thus, high school students' entrepreneurial motivation is more extrinsic. The previous studies indicate that university students have higher intrinsic motivation than high school students (Şeşen & Pruett, 2014; Tüysüz, Yildiran, & Demirci, 2010). Entrepreneurial motivation in high school students is more extrinsic due to the vulnerability to the influence of external parties. In addition, the understanding of high school students on the dimensions of innovativeness, proactiveness, and risk-taking are more related to their daily behavior as influenced by their schoolmates, teachers or family and are not directly related to business ventures or projects. In short, there is a need to understand how to better measure the entrepreneurial orientation of high school students.

Hence, this paper is proposing a way to better measure the entrepreneurial orientation of high school students so that we can understand it better. It explains how our study develops an entrepreneurial orientation scale that is more suitable for the context of high school students through exploratory factor analysis. It begins with a review of the literature on the constructs involved. Then, it explains the methodology adopted during the fieldwork and describes the

analysis process that followed thereafter. The findings of the study are then presented before discussing the study's implications and limitations.

1.1. Entrepreneurial orientation as a behavioral construct

Entrepreneurial orientation reflects the element of disposition, though constructively wise, the entrepreneurial orientation is more strongly seen as behavior (Covin & Lumpkin, 2011). Covin and Slevin (1991) argued that behavior was a central and essential element in entrepreneurial processes. Individuals can be seen as entrepreneurs through their actions and not from their psychological profiles (Covin & Lumpkin, 2011). Gartner (1988) argued that we could recognize entrepreneurs through their actions, and not from their characteristics. Covin and Lumpkin (2011) concluded that entrepreneurial behavioral dispositions or patterns did not guarantee that said or claimed behavior was genuinely manifested as the existence of entrepreneurial orientation. Entrepreneurial orientation is identified through visible behavior (Covin & Lumpkin, 2011). Bolton and Lane (2012) measured university students' behavioral perceptions to indicate their entrepreneurial orientation. This study also investigates entrepreneurial orientation through self-perception of high school students' behavior during a specified period.

1.2. Entrepreneurial orientation dimensions

In the definition of entrepreneurial orientation proposed by Miller (1983) and Covin and Slevin (1989), there are three dimensions, namely innovation, risk-taking, and proactiveness. The innovation dimension consists of exploring opportunities, developing creative ideas, attempting to implement the ideas and begin applying. The dimension of risk-taking consists of the courage to act in uncertainty and the possibility of losing income or losing due to borrowing or giving a strong commitment to certain sources. The proactiveness dimension consists of personal initiative behaviors, role-taking, selling opportunity issues and voicing change (Covin & Slevin, 1989; De & Wennekers, 2008; Lumpkin & Dess, 1996; Miller & Friesen, 1982). Miller (1983) and Covin and Slevin (1989) view these three dimensions as a unity or combination that cannot be independent of each other.

Lumpkin and Dess (1996) proposed five dimensions of entrepreneurial orientation, where three of them were similar to the three dimensions proposed by earlier researchers which are innovativeness, risk-taking and proactiveness, as well as two new dimensions, namely the autonomy dimension and the aggressive competitive dimension. The autonomy dimension means taking independent action to bring new business and the ability to foresee that it will work. The aggressive competitive dimension is an intensive effort of a company to outperform its competitors which is characterized by a strong offensive attitude or aggressive responses to competitive threats (Lumpkin & Dess, 1996). Lumpkin, Cogliser, and Schneider (2009) surveyed 133 MBA students and proved that these two additional dimensions have become indispensable in the entrepreneurial process. This study uses the five dimensions of Lumpkin and Dess (1996) as the basis for investigation. The scale including these five dimensions has been tried out at university students, yet has never been specifically developed for high school students who have entrepreneurial behavior differences.

The aggressive competitive dimension is considered only relevant in a risky business, and the financial situation hence becomes less relevant if applied to the school environment (Bolton & Lane, 2012). Aggressive behavior is also more often connoted as negative behavior at the stage of adolescent development. Relational aggression, a behavior that strives for friends in school to dislike certain students, begins to increase in late childhood and in early adolescent stages (Sanrock, 2012). During the adolescence period, they experience biological, cognitive and emotional changes that can bring about inappropriate behaviors such as aggression (Khademi Mofrad & Mehrabi, 2015). Thus, dimensions that contain aggressive elements are not appropriate to be applied to high school students.

Competitive behavior does not always have to be aggressive. There are two competitive attitudes, namely hypercompetitive attitude and personal development competitive attitude. Hypercompetitive attitude is an individual's indiscriminate need to compete and win, or to avoid defeat, through monetary fees or else as a means to maintain or increase the feeling that they are

worthy, by showing a manipulation orientation, aggressiveness, exploitation and the act of demeaning others in various situations (Ryckman, Hammer, Kaczor, & Gold, 1990). Conversely, personal development competitive attitude is an attitude in which the main focus of the competition is not to win, but rather to use the competitive experience to facilitate personal development (Ryckman, Hammer, Kaczor, & Gold, 1996).

Qualitative research by Andre (2013) indicated that most entrepreneurs view themselves and their colleagues, as being more personal development competitive than hypercompetitive. A high hypercompetitive attitude will avoid feedback or negative input so that they tend to be in a status quo or experience difficulty changing because their attention is more self-directed which inhibits their creativity and innovation. On the other hand, personal development competitive attitude is more open to feedback or negative input so that they are not in a status quo or have willingness to change and paying more attention to the needs or input of other people who are able to foster creativity and innovation (Fodor & Carver, 2000). The willingness to change or learn can increase firm growth without being influenced by competitive market conditions (Kasim, Ekinci, Altinay, & Hussain, 2018), so that attitudes or behavior oriented to personal development can contribute to business success in all competitive situations.

Andre (2013) revealed that one of the main causes of his research results was the suitability of the concept of entrepreneurial orientation behavior and behavior based on achievement motives. This is in line with the research results of McClelland (1965) which proved that entrepreneurs and intrapreneurs have a high need for achievement; meanwhile, personal development competitive attitude is related to the concept of self-actualization which is rooted in motivation or the need for achievement (Andre, 2013). This research uses personal development competitive as an attitude that underlies behavior on adolescent competitiveness dimensions.

1.3. Entrepreneurial intention

Many past studies have discussed entrepreneurial intention of high school students. Paco, Ferreira, Raposo, Rodrigues, & Dinis (2011) examined entrepreneurial intention among Portugal's secondary students. Lord Opoku-Antwi, Amofah, Nyamaah-Koffuor, and Yakubu (2012) identified high school students' entrepreneurial intention in Ghana. While Purwana, Suhud, and Rahayu (2017) examined differences in entrepreneurial intention between high school and university students in Indonesia.

Levenburg and Schwarz (2008) measured entrepreneurial intention by developing two items, which are "I would like to work for myself" and "I would like to start my own venture." These two items were used as external criteria to test the entrepreneurial orientation scale of university students (Bolton & Lane, 2012). However, the results of longitudinal studies proved that regular or academic high school students did not have sufficient occupational-specific skills compared to vocational high school students (Mane, 1999). Thus, most non-vocational high school students preferred going to college or university, instead of directly working or having start-up business after graduation. This study utilizes the two entrepreneurial intention items from Levenburg and Schwarz (2008) which have been adjusted to the context of high school students as external criteria.

2. Methods

This research was conducted in three stages. The first stage explored items from the five dimensions proposed by Lumpkin and Dess (1996). These five dimensions are considered as more suitable for the context of high school students since they have been used by Bolton and Lane (2012) to explore students but at university level. The second stage was exploratory factor analysis in order to achieve dimensions that are suitable for high school students, as proven by its obtained internal validity and reliability. The third stage was to examine the external validity of the dimensions produced from the previous stage.

High school students in this study consisted of junior high school students and senior high school students. The age range for junior high school students was between 13 and 15 years, and for senior high school students was between 16 and 18 years.

2.1. Stage one: items exploration

These scale items were developed based on five dimensions proposed by Lumpkin and Dess (1996). The first stage involved conducting focus group discussions to explore the suitability of the five dimensions under the context of high school students.

The innovativeness, proactiveness and risk-taking dimensions were explored by items which were modified for individual level by Bolton and Lane (2012) through testing them on university students. For example, the statement made by Bolton and Lane (2012) in innovativeness dimension is: "In general, I prefer a strong emphasis in projects on unique, one-of-a-kind approaches rather than revisiting tried and true approaches used before". For proactiveness dimension by Bolton and Lane (2012), one example of statement: "I usually act in anticipation of future problems, needs or changes". Another example in the risk-taking dimension by Bolton and Lane (2012) is "I tend to act 'boldly' in situations where risk is involved".

The autonomy dimension was explored from Lumpkin et al. (2009), where the items were designed for firm context. Example of item for the autonomy dimension by Lumpkin et al. (2009) is "My firm supports the efforts of individuals and/or teams that work autonomously as compared with requiring individuals and/or teams to rely on senior managers to guide their work".

Meanwhile, the aggressive competitive dimension was considered only relevant to risky business and financial situations, hence deemed as less relevant in the school context (Bolton & Lane, 2012). The aggressive competitive dimensions on this scale draft are replaced with competitiveness dimension which is arranged based on personal development competitive behavior (Ryckman et al., 1996). One example of the statement by Ryckman et al. (1996) is "I value competition because it helps me to be the best that I can be".

The Focus Group Discussion (FGD) was conducted by involving 12 teachers in junior and senior high school, and 12 junior and senior high school students. Twelve teachers involved in the FGD consisted of seven teachers of entrepreneurship education, three supervisors of student council, and two student's counselors. All teachers have expertise in understanding the behavior and personality of students everyday in school and the organization associated with entrepreneurial behavior. Twelve students involved in the FGD consisted of three students who were the student council chairmen, six students who became student council in entrepreneurship or creativity department, two students who became the entrepreneurship event committee chair and one student who became the best academics. These students have relevant experience to explore entrepreneurial behavior in their daily lives in class, organization, school and family activities. These were described in Table 1.

The six selected cities were Jakarta, Tangerang, Bandung, Semarang, Yogyakarta, and Surabaya. The six cities are metropolis in six provinces spread across the Java island, Indonesia.

The results of the focus group discussion were used to plot and modify items in the five dimensions to suit the context of high school students. Then, the items from the five dimensions were arranged to draft a quantitative survey instrument measured by 5-point Likert scale (1 = very rarely to 5 = very often).

2.2. Stage two: exploratory factor analysis

The instrument developed in Stage One was then distributed using quota random sampling to high school students in the same six cities. A total of 368 high school students responded to this research survey. All students provided written informed consent prior to responding to the survey. Next, the aforementioned exploratory analysis was conducted to categorize the dimensions

relevant to high school students. Based on the analysis, internal validity tests were carried out on each item inside its respective dimension through corrected item-total correlation (CITC) score with a cut-off value higher than 0.2 indicating a good correlation (Streiner, Norman, & Cairney, 2015). Reliability was tested with Cronbach's α , utilizing standard cut-off point for development studies scale of 0.7 (Nunnally & Bernstein, 1994).

2.3. Stage three: external validity test

The scale was also accompanied by two items of entrepreneurial intention that were modified from Levenburg and Schwarz (2008) in order to adapt it to high school context based on the Focus Group Discussion in the Stage One. Based on the results of focus group discussion involving high school students in Indonesia, many aspired to continue their studies in college, so their entrepreneurial intention remained an aspiration or plan until after graduating from high school, so the items by Levenburg and Schwarz (2008) still needed modification. Two entrepreneurial intention items in this research are "I aspire to open my own business or enterprise" and "I will start pioneering my business or enterprise after graduating from school/college." The total score of each dimension on the entrepreneurial orientation scale that has a Cronbach's $\alpha > 0.7$ was correlated with each entrepreneurial intention item to test its external validity.

3. Result

Based on the results of the focus group discussion, this study found that all the items suggested by Bolton and Lane (2012) were unsuitable for high school students because they were still too abstract, difficult to understand and needed modification to be more concretely representing the daily behavior of high school students. Therefore, this study modified some items and added several items to *innovativeness*, *proactiveness*, and *risk-taking* dimensions. This study also modified the items in *autonomy* dimension from Lumpkin et al. (2009) since it was necessary to change the statements from firm level to individual level, especially for the high school students context. Similarly, the items from competitiveness dimensions of Ryckman et al. (1996), based on the results of focus group discussions, were still considered too abstract and needed modification to represent the high school students' daily behavior in order to be more understandable.

Each dimension consisted of 10 items that were worded positively and two items that were worded negatively, prompting the experience of the students over the past year. For example, in innovativeness dimension, the example of statements we asked the students to rate are: "the things I do (assignments/work) are considered creative by my friends" (positive wording) and "I have a hard time finding creative ways to solve my problems" (negative wording). For risk-taking dimension, examples of the items are, "I have the courage to ask the teacher even though there is a possibility of being scolded by a teacher or ridiculed by my friends" (positive wording) and "I feel safer following the opinions of most (majority) friends in class" (negative wording). Examples of items in the proactiveness dimension are "I invite my friends to work together" (positive wording) and "I wait for another friend to solve the problem in class" (negative wording).

Table 1. Expertise of the focus group participants

Type of Participants	Number of Participants	Expertise of Participants
Middle and High School Teachers	7	Entrepreneurship education
	3	Student council supervisors
	2	Student counselors
Middle and High School Students	3	Student council chairmen
	6	Student council in entrepreneurship or creativity department,
	2	Entrepreneurship event committee chair
	1	The best academics

Examples of items for the autonomy dimension are “*I do my own homework*” (positive wording) and “*I am helped in completing the task*” (negative wording). Examples of items for the competitive dimension are “*I try to find a solution to a failure that I have experienced*” (positive wording) and “*I avoid things that are competitive*” (negative wording). However, not all items can be published because the all valid items have been registered in the Copyright at Ministry of Law and Human Rights Republic of Indonesia, number EC00201823894 dated 15 August 2018. The scale was tested to 368 high school students with characteristics described in Table 2.

Based on the results of exploratory factor analysis with five components grouping, we found only four meaningful components, while the fifth component only contained negatively worded items from various dimensions. Thus, we discarded the items in the fifth component. From the remaining four components we only kept the items with sufficient loading (>0.4) as shown in Table 3.

Component 1 is a grouping of items from the competitiveness dimension. Component 2 is a grouping of items from the proactiveness and risk-taking dimension which—combined—we named risky proactiveness. Component 3 is a grouping of items from the dimension of innovativeness. Finally, component 4 is a grouping of items from the autonomy dimension.

Internal validity test from grouping of four dimensions as a result from the exploratory factor analysis shows that each item in the dimension group has a corrected item-total correlation score (CITC) with values over 0.2, indicating a good level of correlation (Streiner, Norman, & Cairney, 2015) and Cronbach’s α reliability >0.7 (Nunnally & Bernstein, 1994). The innovativeness dimension has seven valid items with CITC 0.402–0.651 and $\alpha = 0.791$. The risky proactiveness dimension has nine valid items with CITC 0.562–0.659 and $\alpha = 0.871$. The autonomy dimension has four valid items with CITC 0.420–0.598 and $\alpha = 0.738$. Meanwhile, the competitiveness dimension has eight valid items with CITC 0.414–0.681 and $\alpha = 0.823$.

The external validity test explored the correlation between scores for each dimension with each entrepreneurial intention item. The result of external validity test shown in Table 4 indicates that each dimension of innovativeness, risky proactiveness and competitiveness are significantly correlated with both entrepreneurial intention items, while the autonomy dimension is not significantly correlated with both entrepreneurial intention items. Thus, only three dimensions are feasible to be used in an entrepreneurial orientation scale for high school students, namely innovativeness, risky proactiveness, and competitiveness. Significant correlations between dimensions too indicate that this scale construct is unidimensional.

Table 2. Characteristics of the subjects (n = 368)

Variable	Item	Frequency	Percentage
Gender	Male	158	2.9
	Female	210	57.1
High School Level	Junior High School	182	49.5
	Senior High School	186	50.5
City	Jakarta	55	14.9
	Bandung	62	16.8
	Tangerang	64	17.4
	Semarang	61	16.6
	Yogyakarta	65	17.7
	Surabaya	61	16.6

Table 3. Final exploratory factor analysis result

Item Number	Component 1	Component 2	Component 3	Component 4
Competitiveness_50	0.743			
Competitiveness_55	0.692			
Competitiveness_25	0.625			
Competitiveness_15	0.613			
Competitiveness_30	0.547			
Competitiveness_10	0.536			
Competitiveness_40	0.511			
Competitiveness_45	0.457			
Proactiveness_43		0.724		
Risk-taking_7		0.660		
Proactiveness_48		0.644		
Proactiveness_28		0.612		
Risk-taking_52		0.611		
Risk-taking_47		0.610		
Proactiveness_8		0.602		
Risk-taking_17		0.593		
Proactiveness_53		0.567		
Innovativeness_1			0.618	
Innovativeness_6			0.582	
Innovativeness_51			0.566	
Innovativeness_21			0.554	
Innovativeness_26			0.524	
Innovativeness_16			0.495	
Innovativeness_36			0.472	
Autonomy_4				0.787
Autonomy_29				0.669
Autonomy_9				0.663
Autonomy_34R				0.545

Table 4. Correlation matrix of validated construct.

	1	2	3	4	5	6
1. Innovativeness	1.00					
2. Risky Proactiveness	0.608**	1.00				
3. Autonomy	0.362**	0.269**	1.00			
4. Competitiveness	0.518**	0.496**	0.376**	1.00		
5. I aspire to open my own business or enterprise.	0.263**	0.201**	-0.038	0.224**	1.00	
6. I will start pioneering my business or enterprise after graduating from school/ college.	0.188**	0.135**	-0.001	0.194**	0.608**	1.00

**Correlation is significant at the 0.01 level (one-tailed).

4. Discussion and conclusions

The results of the focus group discussion show that none of the items suggested by Lumpkin et al. (2009) and Bolton and Lane (2012) are relevant to the context of high school students. The autonomy dimension by Lumpkin et al. (2009) designed for firm context is also irrelevant when used in an individual context, hence requires modification. Meanwhile, items in the dimensions of innovativeness, proactiveness, and risk-taking designed to suit the context of individual entrepreneurial orientation as suggested by Bolton and Lane (2012) are aimed at university students and become less understandable when applied to high school students. This is due to what has been explained in the introduction section, that high school students are not ready to run a cohesive team project usually done by university students, even if those team projects are considered relevant to business ventures (Bolton & Lane, 2012; Santrock, 2012).

The final result of the exploratory factor analysis shows that there are four meaningful component groups in the entrepreneurial orientation scale for high school students. One component, called risky proactiveness, is a grouping of items from the proactiveness and risk-taking dimensions. Proactive actions from individuals who have the initiative to change will usually face the risk of a barrier of people's resistance and inertia or lack of readiness for change (Frese & Fay, 2001). This dimension applies to students in the developmental stage of adolescence who have the primary need to be a member of a peer group that requires conformity to group interest and desires (Santor et al., 2000). While proactive behavior consists of behaviors such as personal initiative, role taking, selling opportunities and voicing change (Miller & Friesen, 1982; Covin & Slevin, 1989; Lumpkin & Dess, 1996; De & Wennekers, 2008), involves challenging and risky behaviors to adolescents who are vulnerable to peer rejection. Peer rejection may occur when there are students who oppose or challenge the behavior or activities that are typically carried out by their peer group. It often happens to students who act as social change agents (Sandstrom, 1999) because social change agents often take proactive action in an effort to create change (Lumpkin & Dess, 1996). Meanwhile, one form of resistance to change is group inertia, that is, rejection due to opposition to group norms (Bradutanu, 2015). Thus, high school students who act proactively may experience peer rejection, while peer rejection will be perceived as a high risk for adolescents who possess the need for conformity to peer groups. Therefore, for high school students, each proactive action will also be associated with risky actions. The risk-taking behavior is a form of proactive behavior, namely personal initiative. The results of the research by Nsereko, Balunywa, Munene, Orobia, and Muhammed (2018) show that personal initiative behavior is positively correlated with proactiveness and social entrepreneurial behavior. Questioning or expressing opinions in class, as well as conveying different views with peer opinions, is an example of behavior in the risk-taking dimension on this scale which basically also requires personal initiation. Risk-taking behavior is also a form of assertive behavior as part of extraversion personality factors in Big Five Personality which are positively correlated with proactive behavior (Bateman & Crant, 1993). Thus, the combination of proactiveness and risk-taking dimensions is proactive behavior that is considered risky for the development stage of high school students, which in the results of this study is called risky proactiveness.

Finally, the dimensions of innovativeness, risky proactiveness and competitiveness command external validity, while the autonomy dimension does not command external validity. As shown in the findings, the autonomy dimension does not correlate with entrepreneurial intention. Lumpkin and Dess (1996) raised the autonomy dimension in firm level which aims to give freedom to the members of the firm in innovating and taking risks. While this research was conducted at the individual level. Not all business owners set up their businesses independently because some of them do it together with their colleagues, so autonomy is not a necessary thing for a business start-up. This finding is consistent with past studies. For example, Rauch, Wiklund, Lumpkin, and Frese (2009) observed in their research that out of 51 studies regarding entrepreneurial orientation, only three utilized the autonomy dimension. Bolton and Lane (2012) likewise abolished the autonomy dimension on a scale developed for university students due to the dimension being

considered as no longer relevant because individuals who have entered adolescence and above already have this dimension.

The study's findings have both theoretical and managerial implications. Theoretically, they add to the knowledge on entrepreneurship education by proposing a measurement instrument that could measure high school students' entrepreneurial orientation. They also highlight the significance of the risky proactiveness dimension to high school students' entrepreneurial orientation. Meanwhile, a practical or managerial implication of the findings is that high school educators could implement the resulting scale to identify and develop entrepreneurial orientation in high school students. Educators could also try to minimize the influence of risky proactiveness by devising ways to minimize peer rejection in relation to high school students' entrepreneurial initiatives. For example, they could intensify awareness campaign to educate high school students about entrepreneurship benefits.

This study is not without limitations. For example, it just explores dimensions and items that are relevant for high school students. Hence, future researchers need to conduct a confirmatory factor analysis of the three dimensions and items compiled in this study. Future researchers also need to develop an entrepreneurial orientation norm index for junior and senior high schools in order to be identified more specifically and followed up by entrepreneurship teachers.

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