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Scale Development for Measuring Entrepreneurial Leadership Competencies

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Abstract

The main objective of this study was to develop and validate the four dimensions of entrepreneurial leadership among the leaders of automotive parts manufacturing businesses in Thailand. The study objectives chosen were designed to answer questions posed in many studies seeking antecedents to entrepreneurial leadership and investigating concepts including personal, managerial, proactive, and technological competencies as indicators of entrepreneurial leadership. Data were gathered from 235 leaders from automotive parts manufacturing businesses in Thailand by using questionnaires. Data analysis used reliability and validity testing with exploratory factor analysis and confirmatory factor analysis to measure each entrepreneurial leadership dimension. This resulted in the initial forty-two items being reduced to twenty-eight items assessing personal competency (four items), managerial competency (twelve items), proactive competency (five items), and technological competency (seven items). The results indicated that all four dimensions had high validity and reliability to measure the entrepreneurial leadership factors. The implications in the development of these factors and future research are discussed.

Keywords: *Entrepreneurial leadership, scale development, leadership competencies*

Introduction

In the field of leadership and entrepreneurship, a new paradigm called entrepreneurial leadership (EL) has been created (Fernald, Solomon, & Tarabishy, 2005). This type of leadership arose from the intersection of leadership and entrepreneurship (Cogliser & Brigham, 2004; Renko, Tarabishy, Carsrud, & Brännback, 2015). It is defined as a leadership role performed according to an entrepreneurial style and that generates activities which deliver greater business performance (Simsek, Jansen, Minichilli, & Escriba-Esteve, 2015). The style has identifiable personal characteristics and traits that involve roles and behaviors to deal with the challenge of constant innovation and change (Swiercz & Lydon, 2002), a plurality of experience and increased capacity for problem-solving (Cope, Kempster, & Parry, 2011), and knowledge and technological competency (Zarefard & Cho, 2017). These competencies are likely to support leaders in the automotive industry to create competitive and sustainable businesses (Leitch & Volery, 2017). This study attempted to find EL dimensions that fit with the current situation in Thailand. Several situations were especially examined, including a robust competitive industry, rapid environmental change, and changing government policy.

From the mentioned characteristics of EL, it would be interesting to study these leadership characteristics in the context of Thailand 4.0. Thailand 4.0 is an economic model recently launched by Thai Government that aims to help the country overcome challenges resulting from past economic development models. It emphasizes the creation of a value-based economy that is driven by innovation, technology, and creativity. This is to be done by a transformative shift from traditional farming, small businesses, or services to smart farming, startups, or high value services – from unskilled laborers to knowledge workers or high skilled laborers – and from buying technologies to creating technologies throughout five business clusters for innovation and startup. These clusters consist of food agriculture and biotech; health, wellness and biomedical engineering; smart devices, robotics, and mechatronics; the Internet of things and digital or embedded technology; and creative, cultural, and high value services. Thailand 4.0 policies indicate that all

leaders who work in these industries should possess superior skills and ability to learn, improve, change, and develop new knowledge to achieve satisfactory business performance (Thailand Investment Review, 2017).

In addition, EL characteristics support and aid in the creation of new processes to produce new products and services using high technology that leads to superior business performance (Anuvareepong, 2017). Moreover, EL also involves functional competencies including operation, finance, marketing, and human resource functions. Jiang (2009) stated that these areas are the main management functions that work together integrally to assist in realizing overall organizational objectives. Some scholars confirm that EL characteristics involve proactive competency (PRC) among managers and employees who are seeking opportunities for career advancement (Zaech & Baldegger, 2017). Previous studies involving EL factors have indicated that several dimensions exist, such as general EL, explorer behavior, minor behavior, accelerator behavior, and integrator behavior (Pihie & Bagheri, 2013). To this must be added vision, influence, innovation and creativity, and identity development (Ramsgaard & Warren, 2015). However, these studies failed to emphasize the influence of technological ability. This competency is very important to all leaders who manage several functions in organizations, particularly those exposed to high competition and industrial changes (e.g. automotive parts manufacturers). Therefore, the highest priority is given to technological competency (TC) in assessing its contribution to EL styles. Thus, the four EL dimensions consist of personal competency (PC), managerial competency (MC), proactive competency (PRC), and technological competency (TC). These competencies will encourage and contribute to fulfillment of the new policies of Thailand 4.0.

The primary purpose of this study was to develop and validate the four dimensions of EL from the various definitions. The study utilized a quantitatively-based questionnaire distributed to executives and managers working in the automotive parts industry throughout Thailand. This industry is strategic in the automotive sector and is key among future-focused industries which set the goal of fostering and promoting emerging technology, innovation, and creativity (Suwannarat, Williams, Smiths, & Ibrahim, 2010; Thailand Investment Review, 2017). This research advances the literature by developing EL competency dimensions in the context of automotive parts manufacturing in Thailand.

Literature Review

One emerging form of leadership is entrepreneurial leadership. This refers to a modern, new leadership role that expresses an entrepreneurial style (Mintzberg, Ahlstrand, & Lampel, 1998). It arose from two fields, namely entrepreneurship and leadership (Ensley, Pearce, & Hmieleski, 2006). Entrepreneurship emphasizes and represents the tenacity and achievement of a business in seizing opportunities that lead to innovation and capability building (Kuratko, 2007). Entrepreneurial activities are very important to all businesses and have many benefits such as seeking opportunities, needing to achieve set goals, being independently-minded, and taking risks and innovating (Fernald, Solomon, & Tarabishy, 2005). In Thailand, robust competitive situations, rapid environmental change, and changing government policies always affect business owners in terms of high risk in managing their businesses effectively. Leaders and managers operating in such contexts and who play a crucial role in organizations should possess particular leadership characteristics necessary to achieve specific business outcomes (Arthur & Hisrich, 2011).

Traditionally, entrepreneurship processes have been explained and understood through the six schools of entrepreneurial thought that can be categorized by individual characteristics, opportunities, management, and adaptation of existing businesses (Cunningham & Lischeron, 1991). Moreover, Cunningham and Lischeron (1991) claimed that entrepreneurs could be realistically assessed by looking at their personal qualities in six areas. First, entrepreneurs are the same as exceptional leaders or managers who possess the personal capacity to perform activities, and who are hard-working and persevering. Second, entrepreneurs have distinctive values, attitudes, and needs which drive them, while

the skill of entrepreneurs places emphasis on personal values, risk taking, and need for achievement. Third, entrepreneurs who have creative and innovative capabilities are able to use these important skills to innovate and accomplish creative things for their organizations. Fourth, entrepreneurs who have ability to create, manage, and take risks in businesses are known to also have management skills such as planning, organizing, leading, and budgeting. Fifth, entrepreneurs are leaders who have the ability to adapt their styles to peoples' needs, and can motivate, direct, and lead others to achieve organizational goals. Lastly, entrepreneurs have skills to manage complex organizations by developing independent units to create new products and expand services, or increase the range of consumer choices. The six schools of thought in entrepreneurship shed light on the unique characteristics of entrepreneurs.

The crucial elements of EL that will be focused on in this study are personal competency (Bagheri, Pihie, & Krauss, 2013), managerial competency (Wahab & Mahmood, 2015), proactive competency (Prieto, 2010), and technological competency (Baylor & Ritchie, 2002).

Personal Competency (PC)

Personal competency means that a given individual can identify opportunities for a business (Krueger & Brazeal, 1994). Personal competencies can be divided into three sub-elements. First in significance is decision-making. This is the ability that individuals utilize when confronted with a specific problem. It consists of developing cognitive strategies regarding information gathering and applying them to decision-making. Second is self-reinforcement. This is involved with self-statements one makes to reinforce one's behavior. Lastly, self-regulation skills represent cognitive strategies that individuals may use in specific situations to manage anxiety or distress (Griffin, Botvin, Scheier, Epstein, & Doyle , 2002). Bagheri and Pihie (2011) indicated that personal competencies represent the ability to apply methods for utilizing learning outcomes to recognize and acquire the necessary personal skills, learning opportunities, knowledge, and competencies for success. Moreover, personal competency is related to personal, outcome, or educational and training models, as well as to the standard approach in which benchmarking criteria are used (Hynes, 1996). These contribute to general cognitive ability, specialized cognitive skills, competence performance, modified competence-performance, objective and subjective self-concepts, motivated action tendencies, action competence, key competencies, and meta-competencies (Le Deist & Winterton, 2005). All of these are connected to leadership responsibility.

Managerial Competency (MC)

Managerial competencies involve underlying characteristics of an individual that are causally related to adequate or superior performance in a job (Klemp Jr, 1980). A manager's competency relates to motives, traits, self-concepts, attitudes or values, content knowledge, cognitive or behavioral skills, aspects of one's self-image or social role, or a body of knowledge, which are used to identify and elaborate on their work (Harley, 1995). Individual characteristic that can be performance enhancers include logical thought, accurate self-assessment, positive regard, development of others, spontaneity, use of unilateral power, self-control, stamina and adaptability, and specialized knowledge (Nwokah & Ahiauzu, 2008). Managerial competency also involves aspects of leadership style (versatility, task, stability, and people leadership), and is concerned with flexibility and growth while creating value in the organization (Rasli, Norhalim, Kowang, & Qureshi, 2015). The model of managerial competency involves managing the future, promoting continuous improvement, maintaining competitiveness, energizing employees, and fostering innovation (Trivellas & Drimoussis, 2013).

Proactive Competency (PRC)

This is a competency area that could be further developed and exercised to help people meet future life challenges (Stanojević, Krstić, Jaredić, & Dimitrijević, 2014). It could involve an educational program that

supports a review of feasible and effective practices in improving business (Bode, de Ridder, & Bensing, 2006). However, proactive competencies are competencies that have elastic or resilient features, and involve flexible and cyclic activities (Pirinen & Fränti, 2008). Moreover, this competency as possessed by proactive leaders involves looking at the behavioral and potential aspects of leadership (Wu & Wang, 2011). The proactive competencies emphasized are drivers of business growth through innovation, and are key sources of generating competitive advantage that is the fundamental source of business value (García-Zambrano, Rodríguez-Castellanos, & García-Merino, 2014).

Technological Competency (TC)

Technological competency represents the abilities or behavior directly related to the nature of utilizing technology and advanced equipment proficiency required to exercise effective control of a business (Murphy et al., 2012). The idea that core or strategic capabilities lead to a business's competitiveness and survival through decision-making and action is supported by Leonard-Barton (1995). Technological competencies are different from other competencies because they change over time. Not surprisingly, some researchers have found that large businesses have more expertise in their technological competencies than small and medium-sized businesses (Patel & Pavitt, 1997). This may be dispersed over a broader range of sectors than their production activities, and so there is a need for more concentrated development efforts in the long-term to keep up with advances in technology (Chiesa, Giglioli, & Manzini, 1999). Technological competencies aid in increasing profitability and enhance innovation and successful business performance (McEvily, Eisenhardt, & Prescott, 2004). These contribute to the achievement of superior performance, exert a direct effect on business's innovative performance (Lokshin, Gils, & Bauer, 2009), and maintain and improve competitive organizational advantages (Bolívar-Ramos, García-Morales, & García-Sánchez, 2012). Therefore, TC is a new dimension of EL along with the other three dimensions because leaders' TC has an important effect on business performance, irrespective of size or type of business.

Research Method

Population and Sampling Method

This study collected data from leaders of automotive parts manufacturing businesses located in Thailand. The automotive parts manufacturing businesses were selected from the list provided by the Thai Auto-parts Manufacturers Association (TAMPA). Letters, containing the aims and confidentiality undertakings of the research, were sent to the business leaders asking for their responses. As a result, a total of 241 out of 616 questionnaires were returned, and 235 were usable. The data collection yielded 18 mailings that were undeliverable caused by changes of address or due to the businesses closing. Thus, the effective response rate was approximately 38.15%. It was planned to develop a new scale for EL competency using exploratory and confirmatory factor analyses (EFA and CFA). According to Anderson and Gerbing (1988), the minimum sample size needed for conducting EFA and CFA should be $N = 150$. Since our sample number was 235 respondents, it constituted an acceptable sample size for use with the EFA and CFA methods of analysis.

Research Instrument

The questionnaire was translated into Thai and checked for inter-translation consistency. The questionnaire was developed based on a review of the existing entrepreneurship indices and tested through a pilot survey, and the instrument was enhanced based on comments and feedback from the pilot survey. This study used a five-point Likert scale ranging from one, which denoted strong disagreement, to five, which denoted strong agreement; this was done to avoid confusion and bias from the fatigue that may accompany use of longer scales. The research instrument was adapted and modified from past studies and the existing entrepreneurship index.

This study divided the instrument into two main parts. The first part related to respondent characteristics that included gender, age, level of education, working experience, monthly income, and

working position. The second part included the four dimensions of EL encompassing personal competency taken from Griffin et al. (2002) and Le Deist and Winterton (2005), and was measured by six items. The managerial competency dimension was adapted from Scaperlanda-Herlein (2009) and Chong (2013) and was assessed by seventeen items. Proactive competency was based on prior studies and consisted of nine items adapted from Gudermann (2011). Technological competency was developed from the prior studies of Collin et al. (2015) and Cortoni, LoPresti, & Cervelli (2015) and was measured by ten items. All variables in the second part were measured by a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

Each item in the four EL dimensions was subjected to face and content validity analysis. Face validity analysis commenced with a literature review that focused on EL definitions and measurement. Twenty-five EL definitions and eighteen EL pieces of research gave approximately forty-two multi-item scales for assessing a variety of EL constructs. Each scale included met the following conditions. First, the measure was developed from a reasonable theoretical base and/or conceptual definition. Second, the measure was composed of several (i.e. at least forty two) items or questions. Third, the measure was developed within the EL literature and was used in, or was relevant to, the leadership competencies literature. Fourth, at least some scaling procedures were employed in scale development. Fifth, estimates of reliability and/or validity existed (Bearden & Netemeyer, 1999). For content validity, these measures were reviewed by three expert judges. Finally, after reviewing each item, the following information was gathered: the name of construct, author names, initial number of items, number of items remaining after judging, number of items in the final scale, number of judges, and the decision rule used for item retention. The results of item-objective congruence (IOC) or content validity measurement showed an overall value of .64, which means that the content validity was acceptable (Turner & Carlson, 2003).

After assessing face and content validity, the researchers also tested the reliability value. The values obtained from 30 respondents in four EL dimensions, comprising personal, managerial, proactive and technological competencies, were .785, .917, .886 and .929, respectively. Moreover, non-response error was tested from all questionnaires. This was accomplished by dividing responses into early (117 questionnaires) respondents and late (118 questionnaires) respondents. No differences were found between early and late respondents. However, it was noted that the proactive competency component showed a difference that was close to .05. In addition, two advanced statistically methods were used, namely, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to test and confirm the validity and reliability value of each item in the four EL dimensions. Finally, this study employed statistical data processes and analytical software after defining the scores in the four EL dimensions (i.e. PC, MC, PRC, and TC).

Results

The respondent profile of the 235 leaders showed 113 males (57.7%), with 38.3% more than 50 years old. In terms of educational level, 119 respondents (60.7%) were holders of a bachelor's degree, while 120 respondents represented working experience of more than 15 years (61.2%) in automotive parts businesses. Most respondents had average monthly incomes of 50,000 to 100,000 Baht (38.8%) and 41.8% were department managers. From the respondents' profiles, several key characteristics can be identified. The majority were males of older age and with a reasonably good educational background. Most of them possessed working experience of more than 15 years, received high monthly incomes, and worked in important positions. The respondents possessed the appropriate characteristics to answer the information in the questionnaire about the four dimensions of EL. Moreover, all EL dimensions of the automotive parts manufacturers returned reliability scores for the PC, MC, PRC, and TC dimensions of .722, .919, .891 and .925, respectively. The results indicated the high reliabilities of all constructs, and hence, they were suitable for EFA and CFA analysis.

Exploratory Factor Analysis

The purpose of this method is data reduction and component summarization. McDonald (2014) stated that factor analysis is a generic term for a somewhat vaguely delimited set of techniques for data processing, mainly applicable to the social and biological sciences. It explores empirical data in order to observe characteristic features and intriguing relationships without imposing a definite model on the data (Stonefield, 1999).

The overall results showed four factors with loadings greater than .40 and communality values greater than .30. For these variables, forty-two items were considered, but after analyzed by EFA, thirty-six items remained for the four dimensions of EL. Bartlett's test of sphericity chi-square was 6,042.895, *df* = 861, and significance was .000. The Kaiser-Meyer-Olkin test was used to measure sampling adequacy. The value obtained was .933, which gives an Anti-image Correlation value between .868 and .962. The communality value ranged from .316 to .733 and was acceptable for this study. The results indicated that items with loading weights less than .40 might be deleted. Therefore, two items were deleted from the PC dimension, the MC dimension lost one item, the PRC dimension was reduced by three items, and the TC dimension remained intact. Appendix 1 shows the details of each question for the four dimensions of EL. A range of statistical data is shown in Table 1. The correlation matrix displays the relations among four constructs, which indicate the relative strength and direction of a linear relationship among constructs in the matrix. The bivariate correlation procedure was subject to a two-tailed test, and was significant at the .01 level.

Table 1. Statistical Validity of Entrepreneurial Leadership Competency Constructs

Competency Construct	Mean	*Standard Deviation*	Cronbach's α	PC	MC	PRC	TC
				Correlation Validity			
Personal	4.403	.494	.753	1.00			
Managerial	4.065	.544	.922	.592***	1.00		
Proactive	4.037	.521	.825	.541***	.731***	1.00	
Technological	3.831	.746	.921	.438***	.610***	.559***	1.00

*** Correlation is significant at the .001 level (2-tailed)

Confirmatory Factor Analysis

According to Anderson and Gerbing (1988) and Wong and Law (2002), the CFA model recognizes the relationship between the observed variables and the fundamental constructs with factors allowed to inter-correlate freely. In this study, the confirmatory measurement model was utilized to assess unidimensional, convergent validity, and construct reliability. Therefore, this measurement model was performed on both independent and dependent variables (Wong & Law, 2002). This was undertaken to evaluate how well the observed variables are linked to a set of latent variables (Choi & Seltzer, 2010). In fact, all measurement models were established based on theoretical and empirical backgrounds suggested in previous studies. The indices that assess goodness of fit of the model encompass the normed chi-square test, a *p*-value that is not significant, goodness of fit index (GFI) and the root mean square error of approximation (RMSEA). Besides that, CFA was also conducted to assess the convergent validity of the measurement model established under the three circumstances suggested by Fornell and Larcker (1981). These are as follows: first, all indicator factor loadings (λ) should be significant. Second, the composite reliability (CR) value is written as *ρ*, with the condition that CR should be greater than .60 (Bagozzi & Yi, 1988). Third, the average variance extracted (AVE) for every idea should be higher than .50 (Kline, 2005).

The results from each dimension of EL are shown in Table 2 and include the PC dimension from EFA (four items); following CFA, no additional items were removed even though some showed R^2 values less than .40. This decision was made after considering other values such as χ^2 /*df* = .809, *p*-value = .445,

GFI = .997, Adjusted Goodness of Fit Index (AGFI) = .983, Standardized Root Mean Residual (SRMR) = .008, and RMSEA = .000 obtained from the goodness of fit evaluation between the conceptual framework and empirical evidence. The second dimension of EL is MC. The CFA results suggested that four items be deleted because the loading value was less than .40. Twelve items remained in MC with satisfactory validity and reliability. PRC is the third dimension of EL Six items remained from EFA but the CFA results suggested one item be deleted. The results showed χ^2 /*df* = .417, *p*-value = .659, GFI = .999, AGFI = .989, SRMR = .004 and RMSEA = .000. These results indicated that the goodness of fit from the five items in PRC possessed adequate validity and reliability. The last dimension of EL is TC. The results from EFA indicated that all items could be retained, but the CFA results suggested three items be deleted. The results showed χ^2 /*df* = 1.394, *p*-value = .184, GFI = .985, AGFI = .954, SRMR = .011 and RMSEA = .041, which indicated adequate validity and reliability values for TC can be represented by four measures of the EL dimension.

Table 2. Standardized Loading, *S.E.*, *t*-value, R^2, CR and AVE of Four EL Dimensions

Item	Factor Loading			R^2	CR	AVE
	Standardized Loading	***S.E.***	***t*-value**			
PC1	.861	.100	10.496***	.741	.771	.474
PC2	.827	-	-	.684		
PC3	.493	.089	7.167***	.229		
PC5	.479	.087	6.944***	.243		
χ^2 = 1.618, *df* = 2, χ^2 /*df* = .809, *p*-value = .445, GFI = .997, AGFI = .983, SRMR = .008, RMSEA = .000						
MC3	.641	.101	9.126***	.410	.910	.459
MC4	.699	.108	9.916***	.488		
MC5	.670	.096	10.277***	.449		
MC6	.711	-	-	.505		
MC7	.723	.089	11.537***	.522		
MC8	.717	.104	10.182***	.514		
MC9	.640	.123	9.126***	.409		
MC10	.635	.122	8.989***	.403		
MC11	.693	.117	9.851***	.480		
MC12	.648	.122	9.239***	.420		
MC13	.651	.112	9.243***	.424		
MC14	.696	.128	9.868***	.484		
χ^2 = 57.907, *df* = 45, χ^2 /*df* = 1.287, *p*-value = .094, GFI = .964, AGFI = .938, SRMR = .015, RMSEA = .035						
PRC2	.635	.102	9.116***	.403	.881	.469
PRC5	.727	-	-	.529		
PRC6	.687	.112	8.954***	.472		
PRC7	.662	.154	6.373***	.439		
PRC8	.710	.163	6.627***	.505		
χ^2 = .834, *df* = 2, χ^2 /*df* = .417, *p*-value = .659, GFI = .999, AGFI = .989, SRMR = .004, RMSEA = .000						
TC2	.640	.062	10.412	.409	.918	.617
TC3	.800	.064	14.185	.640		
TC4	.842	.067	15.099	.709		
TC5	.863	.058	17.975	.744		
TC6	.849	-	-	.722		
TC7	.743	.057	14.323	.552		
TC8	.738	.063	12.706	.545		
χ^2 = 12.550, *df* = 9, χ^2 /*df* = 1.394, *p*-value = .184, GFI = .985, AGFI = .954, SRMR = .011, RMSEA = .041						

Note: CR is composite reliability; AVE is average variance extracted

The AVE value ideally should be higher than 0.5, but our findings indicated that AVE values for PC, MC and PRC were marginally lower than 0.5 (.474, .459 and .469, respectively). However, Fornell and Larcker (1981) confirmed that AVE values lower than 0.5 can be accepted if the CR value is higher than 0.6 (PC = .771, MC = .910, PRC = .881 and PRC = .881). Hence, the convergent validity of the construct remains adequate.

The results indicated that the four EL dimensions (PC, MC, PRC, and TC) measure EL competencies consistent with the current situation in Thailand. The MC dimension especially indicated EL competencies, and TC – the newest dimension – also showed that it was an essential dimension in assessing EL competency.

Discussion and Conclusions

In this study, the four dimensions of EL that related to the automotive parts manufacturing businesses in Thailand were developed and validated. These dimensions and items were conceptualized from prior research findings and combined with the modern leader's skill and technology ability, together with the normal capacities associated with EL ability. Automotive parts manufacturing businesses are very important as they qualify as one of the strategic industries that the Thai Government aims to support through promoting emerging technology, innovation, and creativity. The literature suggests that leaders in automotive parts businesses should ideally possess both leadership and entrepreneurship skills if they are to lead successful business operations. In this study, four dimensions of EL were identified that related to automotive parts businesses' performance.

Although prior conceptual studies on EL exist, attempt to measure EL ability directly remain scarce (Renko et al., 2015). Moreover, existing relevant studies on leadership strongly recommend that systematic and scientific inquiry into the consequences and antecedents of a leader's behavior could significantly enhance the understanding of the complicated interaction between situational and personal predictors (Hall, Blass, Ferris, & Massengale, 2004). Against such a backdrop, the present study attempted to answer the call by Renko et al. (2015) to explore the individual or contextual antecedents of EL and thereby examine personal, managerial, proactive and technological competencies as dimensions and valid measures of EL characteristics.

The findings regarding the validity and reliability of four dimensions of EL consisting of PC, MC, PRC, and TC in automotive parts businesses were consistent with the extant literature (e.g., Bateman & Crant, 1999; Markman & Baron, 2003; Renko et al., 2015; Songkünnatham, 2018). Consistent with the findings of these authors, this means that EL is an essential factor associated with successful leadership in businesses, including high-tech industries, automotive parts industries, and those with a SME context. Meanwhile, the lack of clarity of items and the dimensions of EL that might be used in modern organizations was surprising. Consequently, this research makes two important contributions to an understanding of the EL dimensions in automotive parts businesses. First, it confirmed that the EL dimension had at least four components. The concept that leaders have several abilities significant to success is not new (Swiercz & Lydon, 2002), and is consistent with the findings from Cope et al. (2011) and Wang, Tee and Ahmed (2012). Second, the empirical results obtained relating to the four dimensions of EL indicated they possessed strong validity and reliability. Therefore, future researchers who wish to investigate EL can apply these four dimensions and, in our opinion, recognize the modern dimensions of EL.

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Appendix 1. Research Questions—Entrepreneurial Leadership Dimensions

Codes	Questions
Personal Competency	
PC1	I think about the choices that exist clearly, correctly, and efficiently, before I take any action.
PC2	I think about the possible consequences of each alternative.
PC3	Past experience is one of the important factors helping to make a successful decision making.
PC5	Interaction with stakeholders of my organization continuously improves my operations.
Managerial Competency	
MC3	Normally, I provide guidelines and ways of working to my subordinates effectively.
MC4	Planning correctly and covering all issues leading my organization to success.
MC5	I establish priorities, visualizes all possible changes required to meet future requirements.
MC6	I effectively coordinate the activities of own staff and colleagues to achieve common goals.
MC7	I prudently allocate decision-making to others.
MC8	I effectively monitor and evaluate the results of delegated assignments or projects. Provides appropriate feedback.
MC9	I develop the skills and competences of subordinates through training and development activities related to current and future jobs.
MC10	I make effective use of organization's time and other resources.
MC11	In my organization, documents are systematically organized and data is stored and retrieved efficiently.
MC12	Lifelong learning is what I promote with employees in my organization and to myself.
MC13	My subordinates always obey and follow my instructions and support.
MC14	My organizational structure is conducive to my operation efficiently.
Proactive Competency	
PRC2	Wherever I have been, I have been a powerful force for constructive change.
PRC5	I always wish to seek better ways of working to make my operation success.
PRC6	If I am creative and likely to succeed in the future, I will fight and pursue that idea although it has been resisted and disliked by others.
PRC7	I excel at identifying opportunities.
PRC8	I have the ability to predict what will happen in the future.
Technological Competency	
TC2	I have the knowledge to develop and maintain computer-based communication links with our customers.
TC3	I have collected information about my customers through online resources as the way I work in my organization.
TC4	The use of computer systems to collect and analyze marketing information about my customers is a critical skill for the organization's operations.
TC5	The computer system I use has access to external marketing resources that are critical to my organization's decision.
TC6	I use computer-based system to analyze customer and market information
TC7	Computer decision support system is used to manage customer information and other information.
TC8	I can effectively store and process customer information.