

Using Fuzzy Multiple Criteria Decision Analysis to Explore the Decisive Factors of Charismatic Leadership

Chi-Hui Wu¹, Jing Li² and Chao-Yu Chen³

¹Department of Management and Information, National Open University, ZhongZheng Rd., New Taipei, Taiwan

²College of Music and Film, Tianjin Normal University, Tianjin, China

³Ph.D. Program in Management, Da-Yeh University, University Rd., Chunghua, Taiwan

Keywords: Charismatic Leadership, Fuzzy Delphi Method, Fuzzy DEMATEL.

Abstract: Charismatic leadership is a key factor that affects organizational effectiveness, team effectiveness, and the behavior of subordinates. How to effectively lead an organization and motivate members through charismatic leadership is an important issue for executives and managers. Given that charismatic leadership encompasses a variety of characteristics and complex entanglements, and that executives have limited time and energy, the most important and pressing issue is how to accurately identify the determinants of charismatic leadership and provide executives with references for effective charismatic leadership. To this end, this study began with a literature review of 22 scholars and experts who selected three key dimensions and 18 criteria for constructing charismatic leadership. A further 20 experts were invited to assess the correlations between the dimensions and the criteria, and a Fuzzy DEMATEL method was used to analyze the causal relationships between the dimensions and the criteria to identify the charismatic leadership determinants. The results of the study revealed that in terms of the dimensions, model shaping was the determining dimension for charismatic leadership, which influenced the other two dimensions; in terms of the criteria, role models and behavioral benchmarks, leadership behaviors of charisma, and emotionally intelligent were the determining criteria for charismatic leadership. Therefore, business executives and organizational leaders must be the first to set a good paradigm for their subordinates, be able to set an example and be selfless, be willing to take risks, be self-sacrificing, think creatively and be sympathetic to the behavior of their subordinates, and also focus on their self-image management, be willing to break out of the status quo and have good emotional management skills to build a sense of belonging in the organizational team. They should also be willing to break through problems and have good emotional management skills to build a sense of belonging to the organization.

1 INTRODUCTION

Leadership is an important issue in the field of organizational management in the social sciences (Day & Antonakis, 2012; Lin & Chung, 2020; Lin, Lo & Chan, 2017). Leadership behavior affects organizational effectiveness, team effectiveness, and subordinate behavior (Liu, Hsieh, 2016; Tzeng, Su & Hsieh, 2005), and leaders primarily influence organizational strategies and decisions (Kaiser, Hogan & Craig, 2008). In the mainstream of leadership research, Charismatic Leadership is one of the most explored topics, with a large body of empirical data that supports it as the most effective form of leadership (Chen, Yang, & Wang, 2017; Knippenberg & Sitkin, 2013). Charismatic leadership is a mainstream area of leadership theory (Zhao & Li,

2019). Furthermore, charismatic leadership influences how supervisors lead, and for the organization's members, it serves as a paradigm of the example of leadership (Kao & Chuang, 2009; Lin & Chung, 2020) to model shaping themselves, and it also has significant implications for shaping the perceptions and behaviors (Kao & Chuang, 2009; Lin & Chung, 2020) to shape their subordinates. The leader of the organization is a key factor in the development of the organization's culture, and it influences the values shared by the members to shape the culture of the organization (Lin & Chung, 2020). Leadership is a multi-conceptual hierarchical trait, that cannot just analyze at a single level (Cheng, Lin, Cheng, Chou, Jen & Farh, 2010), and it is a complex and diverse research topic (Day & Antonakis, 2012; Zhao & Li, 2019)

As charismatic leadership scholars have studied charismatic leadership from different perspectives, and they have used different dimensions to measure it in different contexts (Banks, Engemann, Williams, Gooty, McCauley, & Medaugh, 2016). Moreover, in the past, most scholars have studied charismatic leadership from a single point of view or at a single level, or have used a single case to explore a single dimension of charismatic leadership, but fewer scholars have explored charismatic leadership from different points of view and multiple dimensions, therefore, there is no consistent conclusion yet. Because there are many different indicators of charismatic leadership, it is difficult to assess them from a single perspective or on a single dimension scale. Banks, Engemann, Williams, Gooty, McCauley and Medaugh (2016), Sackett and Larson (1990), Schmidt and Hunter (2015) suggest that integrating different perspectives and multiple dimensions to measure charismatic leadership is a more objective definition and measure of it. In recent decades, charismatic leadership has received a great deal of attention in the field of organizational management, and there has been a proliferation of research on charismatic leadership, and it is generally accepted that charismatic leadership has a critical impact and the ability to induce change. However, scholars who have studied charismatic leadership still lack consensus on what constitutes charismatic leadership (Huang, Lin, Cheng & Liang, 2012). A majority of charismatic leadership scholars have explored charismatic leadership from a single perspective, such as the model shaping dimension or subordinate shaping dimension; or they have studied it from a single point of view, such as the charismatic trait theory or the charismatic attribution theory, but without integrating the concept to explore charismatic leadership. It is therefore necessary to construct a theoretical model of the determinants of charismatic leadership.

In the literature on charismatic leadership, different scholars have adopted different perspectives on charismatic leadership, resulting in different findings and theoretical frameworks. Therefore, this study will integrate the different perspectives on charismatic leadership, including the social charisma paradigm, which is based on a sociological approach, to explore the social conditions for charismatic leadership. The second one is the neo-charismatic leadership paradigm, which is based on psychological approaches. The study was developed by organizational behavior scholars on the characteristics and behaviors of charismatic leaders, and the effects and methods of influence on their

subordinates (Huang, Lin, Cheng & Liang (2012). As many criterion factors influence charismatic leadership, and they interact with each other and have complex relationships, charismatic leadership is a multi-criteria analysis problem (Banks, Engemann, Williams, Gooty, McCauley & Medaugh, 2016; Sackett & Larson, 1990; Schmidt & Hunter, 2015). Therefore, this study uses the fuzzy Delphi method, in which key assessment criteria and charismatic leadership frameworks are screened. In addition, the fuzzy theory has the property of capturing the fuzziness of problems and solving subjective problems (Wu, Lin & Li, 2022), and the complex interactions between dimensions and criteria must be considered. By combining fuzzy set theory and the Decision-making Trial and Evaluation Laboratory (DEMATEL), we analyze the degree of association and causality between the dimensions of charismatic leadership and the criteria and obtain further information on the direction and degree of influence between the dimensions and the criteria.

2 THEORETICAL BACKGROUND

Leader is a key influence on organizational strategy and decision-making (Kaiser, Hogan, & Craig, 2008). In the field of management, leadership research has become one of the most important issues (Lin & Chung, 2020, Lin, Lo, & Chan, 2017), and charismatic leadership research is one of the most frequently explored topics in the mainstream of leadership research, and it is the most effective form leadership with extensive empirical data supporting (Chen, Yang, & Wang, 2017; Knippenberg & Sitkin, 2013). Charismatic leadership is a mainstream area of leadership theory (Zhao & Li, 2019).

The concept of charismatic leadership was introduced by Weber (1947) as a theory of leadership in which the leader at the top encourages followers and applies his or her charisma to get them to make beneficial changes in the organization. (Bass, 1997), House's (1976) point out that the characterization of charismatic leadership in the organizational context, its behavioral dimensions, and hypotheses, has initiated subsequent scholarly research into charismatic leadership. Charismatic leadership has been gaining attention since the 1980s and has attracted a great deal of interest from researchers and educational practitioners (Hoy & Miskel, 2005). Scholars of charismatic leadership have used different terms to describe charismatic leadership,

such as charismatic (House, 1976), transformational (Bass, 1985; Burns, 1978), visionary (Bennis & Nanus, 1985; Sashkin, 1988), value-based leadership (House, Delbecq, & Taris, 1998).

Charismatic leadership is a new paradigm theory in the field of organizational leadership (Day & Antonakis, 2012). The theory associated with charismatic leadership emphasizes the leader's ability to change the subordinates' needs, values, self-concept, and motivation, which leads to many emotional and cognitive responses from the staff. In short, the core concept of charismatic leadership is to induce internal change in the subordinates, thereby achieving an impact on them and the organization (Huang, Lin, Cheng & Liang, 2012). Because Charismatic Leadership positively influences the effectiveness of the subordinates and the organization, the effects of Charismatic Leadership are more pronounced than other types of leadership (Fio, Harris, & House, 1999).

As scholars of charismatic leadership have come up with different perspectives including charismatic leadership behavior theory (Conger & Kanungo, 1987; Behling & McFillen, 1996; Zhao, Tian, Wen & Gao, 2021), social exchange theory (Blau, 1964; Sparrowe & Liden, 1997), social identity theory (Bandura, 1977; Hogg & Van Knippenberg, 2003; Zhao, Tian, Wen & Gao, 2021), trait theory (House, 1976; Banks, Engemann, Williams, Gooty, McCauley, & Medaugh, 2016), cognitive ability theory (Banks, Engemann, Williams, Gooty, McCauley, & Medaugh, 2016), social learning theory (Karaca, Özgül, & Zehir, 2021), and other perspectives.

Charismatic leadership influences supervisors' leadership styles, and it also serves as a role model for members within the organization to lead by example (Kao & Chuang, 2009; Lin & Chung, 2020), it will be self-modeling and has significant implications for shaping the perceptions and behaviors of its members (Kao & Chuang, 2009; Lin & Chung, 2020) to shape the subordinates. The leader of the organization is a key factor in the development of the organization's culture and influences the values shared by the members of the organization to shape the organization's culture (Lin & Chung, 2020). Leadership is a multi-conceptual hierarchy, not only analyzed at a single level (Cheng, Lin, Cheng, Chou, Jen & Farh, 2010) but also a complex and diverse research topic (Day & Antonakis, 2012; Zhao & Li, 2019). Therefore, this study will explore and analyze the determinants of charismatic leadership by integrating different perspectives at multiple levels,

including model shaping, subordinate shaping, and culture shaping dimension.

In terms of the three dimensions of charismatic leadership: model shaping, subordinate shaping, and culture shaping. The first is the leader's own attributes, behaviors, and abilities; the second is the leader's influence on his or her subordinates; and the third is the leader's influence on the organization's culture. Therefore, this study integrates the charismatic leadership theory which includes model shaping, subordinate shaping, and culture shaping, as the charismatic leadership framework. Model shaping is the ability of a charismatic leader to lead by example, convince others by virtue, and accept different opinions and criticisms with an open mind (Huang and Kao, 2014; Brown, Trevino & Harrison, 2005). Subordinate shaping is when charismatic leaders communicate their values to their subordinates during direct contact and interaction with them, and charismatic leaders demonstrate their values and goals through personal example, thus exerting influence on their subordinates (Huang & Kao, 2014; Huang, Lin, Cheng & Liang, 2012). Culture shaping is a way for charismatic leaders to communicate their ideas and visions to all members of the organization through symbolic behaviors that emphasize important cultural values and establish shared values for the group, which in turn exerts influence on the group (Huang & Kao, 2014; Huang, Lin, Cheng & Liang, 2012).

Different scholars have had different views on the model shaping dimension. For instance, Bass (1985) and Bryman (1992) identify the physical traits of charisma as one of the charismatic leadership attributes; Bass (1985), House (1976), Hoy and Miskel (2005), and Yukl (1989) point out that psychological traits of charisma as an important factor for charismatic leaders; In the research by House and Howell (1992), Banks, Engemann, Williams, Gooty, McCauley, and Medaugh (2016) argue that personality traits of charisma as an antecedent factor for charismatic leadership; Huang, Lin, Cheng & Liang (2012) conclude that leadership behavior of charisma, and emotionally intelligent as the main factors of charismatic leadership. Therefore, the five criteria for the model shaping dimension in this study are physical traits of charisma, psychological traits of charisma, personality traits of charisma, leadership behaviors of charisma, and emotionally intelligent.

Scholars are arguing about the factor of subordinate shaping. For instance, Huang, Lin, Cheng & Liang (2012) state that inspirational motivation, sociability, supportive behaviors, and successful

experiences are the factors of subordinate shaping, while Neufeld, Dong, and Higgins (2007) consider that inspirational motivation and idealized influence are the main factors, and charismatic leadership affects subordinates' performance and effort, and social influence; Yeh and Lin (2013), Shamir, Zakay and Popper (1998) note that role models and behavioral benchmarks as important factors; Saleh and Hosek (1976), Wu and Chung (2011) mention that work engagement is one of the factors of subordinate shaping that constitute charismatic leaders; Wu, Lu, Ku & Chang (2010), Huang, Lin Cheng & Liang (2012) recognize that inspirational intelligence of subordinate is a major factor of subordinate shaping; In the research by Yukl (1994), Wu and Hong (2005) identify fairness and justice. Therefore, there are seven criteria for subordinate shaping in this study, namely role models and behavioral benchmarks, work engagement, inspirational motivation, sociability, supportive behavior and successful experiences, inspirational intelligence of subordinates, and fairness and justice.

In the context of culture shaping, scholars who study charismatic leadership also have different views on the criteria. According to Huang, Lin, Cheng & Liang (2012), culture shaping includes a developmental vision and goal setting, team building, and mastery of external environmental opportunities; Hu and Dutta (2022), Yan, Wu & Lin (2018) also point out that visionary as a core factor of culture shaping; However, Banks, Engemann, Williams, Gooty, McCauley, and Medaugh (2016) suggest that work performance is a pre-requisite for culture shaping of charismatic leaders; Hsu (2003), Cheng (2004), Banks, Engemann, Williams, Gooty, McCauley & Medaugh (2016), Imani-Hassanloui, Maraki, Taghimalek and Tagimalek (2022) cite that organizational citizenship behavior as one of the criteria of culture shaping; Ashforth & Mael (1989), Huang (2020), Huang, Lin, Cheng & Liang (2012) consider that organizational identity; Paulsen, Maldonado, Callan, and Ayoko (2009) state that team identity. The criteria of culture shaping in this study are work performance, organizational citizenship behavior, developmental vision and goal setting, team building, and organizational identity and mastery of external environmental opportunities.

Moreover, charismatic leadership is a powerful and trainable skill (Antonakis, Fenley & Liechti, 2011; Ernst, Banks, Loignon, Frear, Williams, Arciniega, Gupta, Kodydek & Subramanian, 2021). Most of the aforementioned literature on charismatic leadership has been based on a single theoretical perspective and a single level of analysis of

charismatic leadership but has not explored in depth the key factors that influence charismatic leadership. Therefore, it is necessary to explore charismatic leadership from different theoretical perspectives and multiple levels and to construct a charismatic leadership framework in order to provide a wide range of academic perspectives to explore charismatic leadership in depth and to provide organizational leaders with the skills to develop charismatic leadership.

3 RESEARCH METHODOLOGY AND DESIGN

Based on the literature, this study summarizes the key factors influencing charismatic leadership, with a total of 18 criteria in three major dimensions. The main targets of this study were scholars and experts in the field of charismatic leadership in northern and central Taiwan, as well as mid- and senior-level executives and leaders in the high-tech industry. Firstly, the Fuzzy Delphi method was used to screen out the criteria items with higher relative importance. The next step was to use Fuzzy DEMATEL to explore the relationship between the dimensions and the criteria. And then, the matrix of relationships between dimensions and criteria is constructed, causal relationships are mapped and causal pathways of influence are analyzed to explore the determinants of charismatic leadership.

This study uses the fuzzy Delphi method to screen out relatively important items in the charismatic leadership profile criteria. The Fuzzy Delphi Method (Liang, Lee, & Huang, 2010) is a four-step process. Step 1: Gather the views of the decision-making community, step 2: Create a triangular fuzzy number, step 3: Defuzzification, and step 4: Selection of evaluation criteria. The retention dimensions and criteria questionnaire were distributed to 27 academics and practical experts, using their knowledge and experience to determine whether to retain the criteria. 5 academics with less than 10 years of experience or who are not experts in technology industry leadership and research leaders have been screened out. The threshold used in this study is 70%, meaning that a criterion will be retained if more than 70% of academics and experts agree to retain it. For the three dimensions and 18 criteria identified in this study, all criteria have been retained because more than 70% of experts and academics agree to retain them.

Table 1: Fuzzy Delphi Method Questionnaire Item Statistics.

No	Charismatic Leadership Criteria	Threshold values	Retain/Delete
1	Physical traits of charisma	0.736	Retain
2	Psychological traits of charisma	0.874	Retain
3	Personality traits of charisma	0.791	Retain
4	Leadership behaviors of charisma	0.797	Retain
5	Emotionally intelligent	0.748	Retain
6	Role models and behavioral benchmarks	0.773	Retain
7	Work engagement	0.827	Retain
8	Inspirational motivation	0.797	Retain
9	Sociability	0.784	Retain
10	Supportive behavior and successful experiences	0.820	Retain
11	Inspirational intelligence of subordinates	0.748	Retain
12	Fairness and justice	0.761	Retain
13	Work performance	0.827	Retain
14	Organizational citizenship behavior	0.724	Retain
15	Developmental vision and goal setting	0.779	Retain
16	Team building	0.851	Retain
17	Organizational identity	0.808	Retain
18	Mastery of external environmental opportunities	0.736	Retain

The Fuzzy DEMATEL is a method that combines fuzzy semantic variables and DEMATEL. The formula and calculation steps (Hsu, Chen & Tzeng, 2007; Wu, Liao, Tseng & Chiu, 2015; Yeh & Huang, 2014) as followed, has seven steps. Step 1: Define the evaluation criteria and design a fuzzy semantic scale, step 2: Create a direct association matrix, step 3: Build and analyze the structural model, step 4: Total association matrix, step 5: Defuzzification, step 6: Centrality and Causality, and step 7: Result Analysis.

4 ANALYSIS AND DISCUSSION OF THE FINDINGS

In this phase, 20 scholars with more than 5 years of experience in research and charismatic leadership or technology industry executives were invited to take the survey. The questionnaires were then distributed on-spot to these researchers/technology executives for completion. After three months of the survey, there were 20 valid questionnaires, including 4 for researchers and 16 for technology executives. The results of the various components and criteria were then analyzed.

4.1 Results of the Analysis of the Various Dimensions

The evaluation of the dimensions is the model shaping dimension (M), the subordinate shaping dimension (S), and the culture shaping dimension (C). After defining the evaluation dimensions and designing the fuzzy semantic scales, establishing the direct association matrix, building and analyzing the structural model, the total association matrix and defuzzification, the formulae and calculations, the defuzzification matrix for each dimension is shown in Table 2. After the calculation of the centrality and causality, the column and row values of each dimension are shown in Table 3. After obtaining the value of d+r (centrality) and d-r (causality), the cause-effect diagram can be plotted by each value as shown in Figure 1. The value of d+r (centrality) represents the strength of the influence between the dimensions, and the higher the value, the stronger the influence. When the value of d-r is positive and the value is higher, it represents the "cause" of the influence of other dimensions, and when d-r is negative and the value is lower, it represents the "effect" of the influence of other dimensions.

Table 2: Matrix of defuzzied total correlations of the dimensions.

Dimension	Model shaping (M)	Subordinate shaping (S)	Culture shaping (C)
Model shaping (M)	0.80	1.574*	1.401*
Subordinate shaping (S)	0.833	0.913	1.071*
Culture shaping (C)	0.764	1.186*	0.779

Note: * Indicates above the threshold value of 1.036.

Table 3: Collation of column and row values of dimension.

Dimension	<i>d</i>	<i>r</i>	<i>d+r</i>	<i>d-r</i>	Quadrant	Causal relationship
M	3.775	2.397	6.173	1.378	2 nd	Affect others
S	2.817	3.672	6.489	-0.856	4 th	Affected dimension
C	2.728	3.251	5.979	-0.522	3 rd	Independence dimension
Average			6.214	0		

Note: Model shaping (M), Subordinate shaping (S), Culture shaping (C)

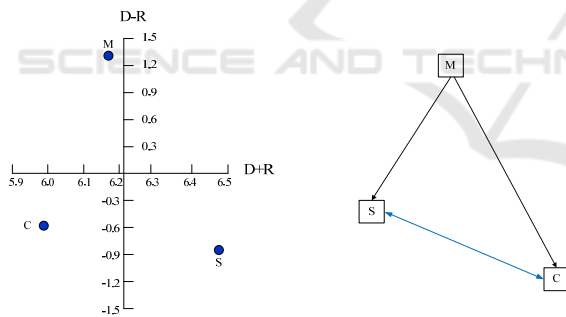


Figure 1: Causality correlation diagram of various dimensions.

In the causality (*d-r*) section, the three dimensions of charismatic leadership in the technology industry are classified into cause and effect clusters based on the *d-r* (causality) value. Those dimensions with positive *d-r* (causality) values are classified as cause groups, and those with a positive "model shaping (M)" value directly influence the other dimensions. Therefore, leaders and supervisors should consider this dimension as an important target for the development of charismatic leadership and strengthen the model shaping dimension of the cause group to enhance the charismatic leadership criteria

of the other dimensions. So, the "model shaping (M)" is the most influential of the other dimensions and should be treated as the most important dimension in the development of charismatic leadership for technology executives. The other dimensions with negative *d-r* (causality) values were categorized as effect clusters, namely 'subordinate shaping (S)' and 'culture shaping (C)', representing the influence of other dimensions. The extent to which these two dimensions are affected more than their own influence, so leaders and supervisors can see them as issues to be addressed in the long-term development of charismatic leadership. The highest positive value of *d-r* is the 'model shaping (M)', which represents the 'cause' of the most influence on the other dimensions, while the 'subordinate shaping (S)' and 'culture shaping (C)' are the 'effect' of the most influence from the other dimensions. As such, the model shaping dimension is the foundation of the charismatic leadership factor for technology executives.

In terms of overall consideration, if technology executives want to enhance their charismatic leadership, they should choose the most influential dimension, namely, "model shaping dimension (M)", which directly affects the other two dimensions of charismatic leadership, namely, subordinate shaping (S) and culture shaping (C).

The arithmetic means of centrality (*d+r*) was 6.214, which was set as the threshold value. The charismatic leadership dimensions of the technology executives fall in each quadrant, as shown in the quadrant positions on the cause-effect diagram in Figure 1. No dimension of charismatic leadership is located in quadrant 1, which is a high centrality and causality quadrant and occupies a relatively important position with the other quadrants. The charismatic leadership dimension in quadrant 2 is the 'model shaping dimension (M)', which is low in centrality but high in causality, and this dimension influences the dimensions in quadrant 4, so we should make it an important dimension of charismatic leadership. The charismatic leadership dimension in quadrant 3 is the 'culture shaping (C)' dimension, which is a low-centrality and low-causality dimension. As the dimension in this quadrant does not affect any of the dimensions of charismatic leadership, they are classified as the least important dimension of charismatic leadership. The charismatic leadership dimension in quadrant 4 is the 'subordinate shaping (S)' dimension, which is a dimension with a high degree of centrality but a low degree of causality, and which can be strengthened by the enhancement of the dimensions in quadrants 1 and 2.

From Figure 1, we can see that the three dimensions are correlated with each other and it is clear that the direction of the arrows of the "model shaping (M)" dimension are all directed towards the other dimensions and are strong, while they are less influenced by the other dimensions. As a result, technology executives have been able to model themselves by developing the personality, behavioral and emotional intelligence of charismatic leaders, to set a good example for their staff and shape the organization's competitive culture. However, the strong relationship between the 'subordinate shaping (S)' and is an influential dimension, highlighting it as a problematic area that affects charismatic leadership. If the two dimensions of model shaping (M) and culture shaping (C) can be improved, then subordinate shaping (S) will also be improved, this will lead to the enhancement of charismatic leadership in the technology industry. It can be seen that 'model shaping (M)' is the defining dimension of charismatic leadership for technology executives, with the other two dimensions of influence being 'subordinate shaping' and 'culture shaping'. Therefore, a technology executive with the charismatic leadership of a role model and the culture of the organization can develop a good role model for his or her subordinates and lead to the achievement of the organization's vision and goals.

4.2 Results of the Analysis of the Criteria

The assessment criteria are physical traits of charisma (M1), psychological traits of charisma (M2), personality traits of charisma (M3), leadership behaviors of charisma (M4), emotionally intelligent (M5), role models and behavioral benchmarks (S1), work engagement (S2), inspirational motivation (S3), sociability (S4), supportive behavior and successful experiences (S5), inspirational intelligence of subordinates (S6), and fairness and justice (S7), work performance (C1), organizational citizenship behavior (C2), developmental vision and goal setting (C3), team building (C4), and organizational identity (C5), and mastery of external environmental opportunities (C6). After defining the criteria and designing the fuzzy semantic scale, establishing a direct association matrix, building and analyzing the structural model, total association matrix, and defuzzification, the defuzzified total association matrix among the criteria is shown in Table 4.

Table 4: Collation of column values by criterion.

Criteria	<i>d</i>	<i>r</i>	<i>d+r</i>	<i>d-r</i>	Quadrant	Causal relationship
M1	1.949	1.937	3.886	0.012	2 nd	Affect others
M2	3.350	2.800	6.150	0.550	1 st	Core criteria
M3	3.319	2.777	6.097	0.542	1 st	Core criteria
M4	3.291	2.842	6.133	0.449	1 st	Core criteria
M5	3.167	2.670	5.838	0.497	1 st	Core criteria
S1	3.162	2.989	6.151	0.174	1 st	Core criteria
S2	2.852	2.892	5.744	-0.040	4 th	Affected criteria
S3	2.945	3.191	6.136	-0.245	4 th	Affected criteria
S4	2.217	2.514	4.731	-0.297	3 rd	Independence criteria
S5	2.709	2.965	5.675	-0.256	3 rd	Independence criteria
S6	2.501	2.665	5.166	-0.164	3 rd	Independence criteria
S7	2.479	2.697	5.176	-0.217	3 rd	Independence criteria
C1	2.604	2.928	5.533	-0.324	3 rd	Independence criteria
C2	2.562	2.772	5.334	-0.209	3 rd	Independence criteria
C3	2.845	2.956	5.801	-0.111	4 th	Affected criteria
C4	2.913	3.114	6.027	-0.201	4 th	Affected criteria
C5	2.736	2.827	5.563	-0.092	4 th	Affected criteria
C6	2.443	2.511	4.955	-0.068	3 rd	Independence criteria
Average			5.561	0.000		

Note: physical traits of charisma (M1), psychological traits of charisma (M2), personality traits of charisma (M3), leadership behaviors of charisma (M4), emotionally intelligent (M5), role models and behavioral benchmarks (S1), work engagement (S2), inspirational motivation (S3), sociability (S4), supportive behavior and successful experiences (S5), inspirational intelligence of subordinates (S6), and fairness and justice (S7), work performance (C1), organizational citizenship behavior (C2), developmental vision and goal setting (C3), team building (C4), and organizational identity (C5), and mastery of external environmental opportunities (C6)

In terms of centrality (*d+r*), these three criteria role models and behavioral benchmarks (S1), psychological traits of charisma (M2), and inspirational motivation (S3) are the most important. In terms of the causality (*d-r*), the value of these six criteria physical traits of charisma (M1), psychological traits of charisma (M2), personality traits of charisma (M3), leadership behaviors of charisma (M4), emotionally intelligent (M5), role models and behavioral benchmarks (S1) are positive values, which means that these are the cause criteria.

Among them, the strongest are psychological traits of charisma (M2), inspirational motivation (S3), emotionally intelligent (M5).

Conversely, the value of these 12 criteria work engagement (S2), inspirational motivation (S3), sociability (S4), supportive behavior and successful experiences (S5), inspirational intelligence of subordinates (S6), and fairness and justice (S7), work performance (C1), organizational citizenship behavior (C2), developmental vision and goal setting (C3), team building (C4), and organizational identity (C5), and mastery of external environmental opportunities (C6) are negative value, which means these criteria are effect criteria. Among these criteria, work performance (C1), sociability (S4), supportive behavior and successful experiences (S5), and inspirational motivation (S3) have the highest negative values. According to the causal relationships obtained from the combined centrality and causality analyses, psychological traits of charisma (M2) is the strongest influence, while the most influential criterion was work performance (C1). Among the charismatic leadership criteria for technology executives, psychological traits of charisma (M2), personality traits of charisma (M3), and emotionally intelligent (M5) are the most influential criteria in determining charismatic leadership and are the main criteria for improving charismatic leadership.

In the causality (d-r) section, the 18 criteria that influence the charismatic leadership of technology executives can be grouped into cause-effect clusters based on the d-r (causality) values. Criteria with positive d-r (causality) values are categorized as cause clusters, with a total of six criteria categorized. Positive criteria have a direct impact on other criteria. Therefore, supervisors and leaders should consider these criteria as important targets for enhancing charismatic leadership, and strengthen the ability of the reason group criteria to enhance the other criteria of charismatic leadership. The most influential criteria are "psychological traits of charisma (M2), personality traits of charisma (M3), and emotionally intelligent (M5). These three criteria are the most influential criteria and should be treated as the most important criteria for charismatic leadership and the most influential "cause" of the other criteria. The higher the proportion of charismatic psychological traits, charismatic personality traits, and emotional intelligence, the stronger the influence of other criteria on charismatic leadership. Therefore, the psychological attributes, personality traits, and emotional intelligence of technology executives are the basis for charismatic leadership. The negative value of d-r (causality) is classified as the effect

cluster. A total of 12 criteria were categorized as effect clusters, representing the extent to which they are influenced by other criteria. The extent of being affected by these 12 criteria is more than their own influence, so technology executives and leaders should consider these 12 criteria as issues to be addressed in the long-term development of charismatic leadership.

The arithmetic mean of centrality (d+r) was 5.561, and its value was set as the threshold value. The charismatic leadership criteria fall in each quadrant, as shown in Table 4. These five criteria psychological traits of charisma (M2), personality traits of charisma (M3), leadership behaviors of charisma (M4), emotionally intelligent (M5), role models, and behavioral benchmarks (S1) that influence charismatic leadership are in quadrant 1. They are high centrality and causality criteria. Criteria in this quadrant are relatively important compared to those in the other quadrants. There is only one criterion of influencing charismatic leadership in quadrant 2, namely, physical traits of charisma (M1), which is a low-centrality, but high-causality criterion that influences the criteria in quadrant 4 and is therefore ranked as an important criterion influencing charismatic leadership. The criteria for charismatic leadership in quadrant 3 are sociability (S4), supportive behavior, inspirational intelligence of subordinates (S6), fairness and justice (S7), work performance (C1), organizational citizenship behavior (C2), and mastery of external environmental opportunities (C6). These are the criteria with low centrality and low causality. As the criteria in this quadrant do not affect any of the charismatic leadership criteria, they are classified as the least important criteria for charismatic leadership. The six criteria in quadrant 4 that influence charismatic leadership are work engagement (S2), inspirational motivation (S3), supportive behavior and successful experiences (S5), developmental vision and goal setting (C3), team building (C4), and organizational identity (C5), which are high in centrality but low in causality. These six criteria can be enhanced by the enhancement of the criteria in quadrants 1 and 2 to strengthen charismatic leadership skills. If the influence of charismatic leadership criteria in quadrant 1 is increased, it will improve the influence of charismatic leadership criteria in quadrant 4, as the criteria of model shaping will influence the criteria of subordinate shaping, and culture shaping and they have a complex entanglement relationship. Except for model shaping, psychological traits of charisma (M2), and personality traits of charisma (M3), should be improved as the priority for enhancing charismatic

leadership. In addition to modeling charismatic leadership, the criteria of charismatic psychological attributes (M2) and charismatic personality attributes (M3) should be improved as the priority for enhancing charismatic leadership. In addition, improving the charismatic leadership criteria in quadrant 2 will also improve the charismatic leadership criteria in quadrant 4, and is therefore ranked as the second priority for improving charismatic leadership. This means that in addition to the criteria psychological traits of charisma (M2), personality traits of charisma (M3), leadership behaviors of charisma (M4) of Model shaping (M), the criterion role models and behavioral benchmarks (S1) of Subordinate shaping (S) is a decisive factor in charismatic leadership. It influences 13 other criteria that influence charismatic leadership, and there is a correlation between Model shaping (M), Subordinate shaping (S), and Culture shaping (C). As role models and behavioral benchmarks (S1) is the key criterion for Subordinate shaping (S), strengthening it is an important target task for Subordinate shaping (S). In addition, Model shaping (M) is an important factor in charismatic leadership, so technology executives and leaders should enhance the Model shaping (M) factor to improve charismatic leadership.

5 CONCLUSIONS

In terms of dimension, first of all, the model shaping dimension is the main influence on other dimensions; and in terms of dimension level, the model shaping is the most influential cause of other dimensions, while the subordinate shaping and the culture shaping are the effects of the influence. In addition, the culture shaping dimension is the high degree affected dimension, so the charismatic leadership of leaders can therefore be achieved through the construction of a model shaping dimension. Hence, the high mutual influence and importance of subordinate shaping on culture shaping suggest that leaders also need to strengthen the subordinate shaping dimension. Secondly, the model shaping dimension is the main decisive dimension of charismatic leadership. The model shaping dimension has a direct impact on the subordinate shaping and culture shaping dimension, and it is a fundamental factor in enhancing the charismatic leadership of leaders. Therefore, leaders must first develop charismatic leadership traits and charismatic leadership behaviors, as well as the ability to be emotionally intelligent, in order to establish a role model for employees within the organization and to influence organizational

effectiveness and subordinate behavior, so model shaping is the foundation for leaders to establish charismatic leadership.

In terms of criteria, firstly, the psychological traits of charisma, personality traits of charisma, leadership behaviors of charisma, emotionally intelligent, and role models and behavioral benchmarks are the main influencing criteria for the other criteria. They mainly influence other criteria, especially the psychological trait of charisma, which is the strongest influence on other criteria, except for the physical traits of charisma, which is not influenced. In addition, role models and behavioral benchmarks are the strongest influencing criteria that affect other criteria. Leaders can cultivate charismatic leadership skills over time through the most influential role models and behavioral benchmarks, as well as the most influential psychological traits of charisma, in order to shape themselves as confident, autonomous, insightful, and highly motivated individuals who can set an example in the organization and influence their subordinates to follow the charismatic leader's example and selfless behavior. In addition to the role models and behavioral benchmarks, and psychological traits of charisma, personality traits of charisma, leadership behaviors of charisma, and emotionally intelligent are also key criteria that influence other criteria of charismatic leadership, therefore, leaders should also develop charismatic leadership traits of integrity, open-mindedness, affinity and selflessness, and leaders should be capable of charismatic leadership behaviors of risk-taking, self-sacrifice, and innovative tendencies. In other words, the leader must be able to manage his or her emotions effectively and be willing to break away from the status quo to develop charismatic leadership skills. Secondly, psychological traits of charisma, personality traits of charisma, leadership behaviors of charisma, and emotionally intelligent are the main determining factors of charismatic leadership. In addition to being the main determinants of charismatic leadership, they are also the main influencers of other criteria. Therefore, to develop charismatic leadership skills, business executives and organizational leaders can first develop leaders with charismatic leadership skills through psychological attributes, personality traits, leadership behaviors, and emotional intelligence.

As charismatic leadership is a large, complex, and highly variable organizational and leadership issue, however, most of the past studies have examined the determinants of charismatic leadership from a single theoretical perspective. Therefore, it is impossible to integrate an integrated framework to influence

charismatic leadership. In order to understand this issue, this study combines the Fuzzy Delphi method and Fuzzy DEMATEL methodology to propose a more comprehensive and holistic approach to the determinants of charismatic leadership, which has not yet been presented in any research paper and is therefore of academic value.

The academic value of the findings of this study is summarised as follows: 1. The study integrates theoretical perspectives on charismatic leadership and uses a wide range of perspectives to collect and analyze relevant literature, filter out indicators that influence charismatic leadership, and identify the dimensions and criteria that influence charismatic leadership by integrating the views of scholars and experts in charismatic leadership. 2. By using the Fuzzy DEMATEL methodology to assess the dimensions and criteria that influence charismatic leadership, the cause-effect diagram is computed and analyzed to provide a clear and easy understanding of the complex causal structure between the dimensions and criteria of charismatic leadership and the strength and extent of the influence of these factors.

In terms of practical implications, the findings of this study reveal a number of important implications for business executives and organizational leaders. This will help them to select the most important and critical indicators of charismatic leadership so that they can select the appropriate key factors of charismatic leadership to develop a model of charismatic leadership over time, which will inspire their subordinates and make them attracted to the charismatic behavior of the leader. In addition, this study provides a framework for the development of a charismatic leadership model. Furthermore, this study provides a visualization chart to identify the relationships and determinants that influence charismatic leadership factors.

REFERENCES

- Antonakis, J., Fenley, M., & Liechti, S. (2011). Can charisma be taught? Tests of two interventions. *Academy of Management Learning & Education*, 10(3), 374-396.
- Ashforth, B. E. & Mael, F. (1989) Social Identity Theory and the Organization. *Academy of Management Review*, 14(1), 20-39.
- Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review*, 84, 191-215.
- Banks, G.C., Engemann, K.N., Williams, C.E., Gooty, J., McCauley, K.D., & Medaugh, M.R. (2016). A meta-analytic review and future research agenda of charismatic leadership. *The Leadership Quarterly*, 28(4), 508-529.
- Bass, B.M. (1985). *Leadership and performance beyond expectations*. New York: A Division of Macmillan, Inc.
- Bass, B.M. (1997). The Ethics of Transformational Leadership. KLSP: Transformational Leadership, Working Papers, *Academy of Leadership Press*.
- Behling, O., & McFillen, J.M. (1996). A Syncretical Model of Charismatic / Transformational Leadership. *Group & organization management: an international journal*, 21(2), 163-191.
- Bennis, W.S., & Nanus, B. (1985). *Leaders: The strategies for taking charge*. New York: Harper & Row.
- Blau, P.M. (1964). *Exchange and Power in Social Life*, New York: Wiley.
- Bryman, A. (1992). *Charisma and Leadership in Organizations*. London: Sage Publications Ltd.
- Burns, J.M. (1978). *Leadership*. New York: Harper & Row.
- Chen, M.C., Yang, M.S., & Wang, H.H. (2017). The meaning and application of charismatic leadership in nursing. *The Kaohsiung Journal of Nursing*, 34(2), 63-70.
- Cheng, B.S., Lin, T.T., Cheng, H.Y. Chou, L.F., Jen, C.K., & Farh, J.L. (2010). Paternalistic leadership and employee effectiveness: a multiple-level-of-analysis perspective. *Chinese Journal Psychology*, 52, 1-23.
- Cheng, J.N. (2004). The Influential Model of Teachers' "Organizational Citizenship Behavior" in Elementary and Junior High Schools. *Journal of National Taiwan Normal University*, 49(1), 41-62.
- Conger, J.A., & Kanungo, R.N. (1987). Toward a behavioral theory of charismatic leadership in organizational settings. *Academy of Management Review*, 12(4), 627-647.
- Day, D., & Antonakis, J. (2012). *Leadership: Past, present, and future*. The nature of leadership (pp. 3-25). (2nd ed.) Thousand Oaks, CA: Sage.
- Ernst, B.A., Banks, G.C., Loignon, A.C., Frear, K.A., Williams, C.E., Arciniega, L.M., Gupta, R.K., Kodydek, G. & Subramanian, D. (2021). Virtual charismatic leadership and signaling theory: A prospective meta-analysis in five countries. *The Leadership Quarterly*, 33(5), 101541.
- Fio, C.M., Harris, D. & House, R. (1999). Charismatic leadership: Strategies for Effecting Social Change. *Leadership Quarterly*, 10(3), 449-482.
- Hogg, M. A., & van Knippenberg, D. (2003). Social Identity and Leadership Processes in Groups. *Advances in Experimental Social Psychology*, 35, 1-52.
- House, R. J. (1976). *A 1976 Theory of charismatic leadership*. Working Paper Series 76-06. Paper presented at the Southern Illinois University Fourth Biennial Leadership Symposium (Carbondale, Illinois, October 26-28, 1976) (ERIC Document Reproduction Service No. ED133827)
- House, R.J., Delbecq, A., & Taris, T.W. (1998). *Values based leadership: An integrated theory and an empirical test*. Working paper for Center for Leadership and Change Management, University of Pennsylvania, Philadelphia, PA.

- Hoy, W. K. & Miskel, C. G. (2005). *Educational administration: Theory, research, and practice*. Boston: McGraw-Hill.
- Hsu, C. Y., Chen, K. T., & Tzeng, G. H. (2007). FDCDM with fuzzy DEMATEL approach for customers' choice behavior model. *International Journal of Fuzzy Systems*, 9(4), 236-246.
- Hsu, T.R. (2003). The Relationship between Organizational Trust and Organizational Citizenship Behavior in Public Sector. *Open Public Administration Review*, 13, 1-36.
- Hu, J., & Dutta, T. (2022). What's charisma got to do with it? Three faces of charismatic leadership and corporate social responsibility engagement. *Frontiers Psychology*, 13, 829584.
- Huang, M.P., & Kao, F.H. (2014). The Values-Fit Based Charismatic Leadership Theory: The Mediation Process and Multilevel Analysis. *Chinese Journal of Psychology*, 56(2), 215-235.
- Huang, M.P., Lin, T.T., Cheng, B.S., & Liang, W.C. (2012). Charismatic Leadership in the Chinese Enterprises: Construct Analysis and Scale Development. *Journal of Management*, 29(4), 307-331.
- Huang, Y.T., (2020). Renewal of Organizational Capabilities: The Perspective of Organizational Identity. *Sun Yat-sen Management Review*, 28(1), 9-66.
- Imani-Hassanloui, M., Maraki, M.R., Taghimalek, I., & Tagimalek, H. (2022). A Statistical Case Study for the Components of Spiritual and Charismatic Leadership in Reverse Engineering based on Voice of Customer in Iran Khodro Company. *Iranian (Iranica) Journal of Energy and Environment*, 13(3), 209-219.
- Karaca, D., Özgül, B., & Zehir, C. (2021). The relationships among charismatic leadership, job satisfaction, and entrepreneurial orientation: An empirical study in the R&D department. *Business & Management Studies: An International Journal*, 9(4), 1521-1537.
- Kaiser, R.B., Hogan, R., & Craig, S.B. (2008). Leadership and the fate of organizations. *American Psychologist*, 63(2), 96-110.
- Kao, S.F. & Chuang, C.J. (2009). Paternalistic leadership, team socialization and team culture: a study of sports teams. *Research Apply Psychology*, 42, 187-213.
- Knippenberg, D.V., & Sitkin, S.B. (2013). A critical assessment of charismatic transformational leadership research: Back to the drawing board?. *Academy of Management Annals*, 7(1), 1-60.
- Liang, L.W., Lee, T.T., & Huang, B.Y. (2010). Investigation of Merging and Acquisition of Taiwanese Banks - Application of the Fuzzy Delphi Method. *Journal of Financial Studies*, 11(4), 31-65.
- Lin, Y.W. & Chung, Y.C. (2020). Multilevel research on leadership behaviors of nursing supervisors, healthy team climate, and workplace well-being of nurses: mediating effect of nurse health behavior. *Taiwan Journal Public Health*, 39(5), 565-577.
- Lin, Y.N., Lo, C.J., & Chan, C.H. (2017). The relationship among charismatic leadership, psychological capital, work-family conflict, workplace well-being, and innovative behaviors. *Journal of Chinese Creativity*, 8(2), 32-51.
- Liu, H.T. & Hsieh, C.H. (2016). A study of the influence of transformational leadership on subordinate-supervisor value congruence and work group effectiveness: the sample from military personnel. *Fu Hsing Kang Academic Journal*, 109, 1-29.
- Neufeld, D.J., Dong, L.Y., & Higgins, C. (2007). Charismatic leadership and user acceptance of information technology. *European Journal of Information Systems*, 16, 494-510.
- Paulsen, N., Maldonado, D., Callan, V. J., & Ayoko, O. (2009). Charismatic leadership, change and innovation in an R&D organization. *Journal of Organizational Change Management*, 22(5), 511-523.
- Sackett, P. R., & Larson, J. R., Jr. (1990). *Research strategies and tactics in industrial and organizational psychology*. In M. D. Dunnette & L. M. Hough (Eds.), *Handbook of industrial and organizational psychology* (pp. 419-489). Consulting Psychologists Press.
- Sashkin, M. (1988). *The visionary leader*. In J.A. Conger & R.N. Kanungo (Eds.), *Charismatic leadership* (pp. 122-160). San Francisco, CA: Jossey-Bass.
- Schmidt, F.L., & Hunter, J.E. (2015). *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings* (3rd ed.). LA: Sage.
- Shamir, B., Zakay, E., & Popper, M. (1998). Correlates of charismatic leader behavior in military units: Subordinates' attitudes, unit characteristics, and superiors' appraisals of leader performance. *The Academy of Management Journal*, 41(4), 387-409.
- Saleh, S. D., & Hosek, K. (1976). Job involvement: Concepts and Measurements. *Academy of Management Journal*, 2(6), 213-224.
- Sparrowe, R.T., & Liden, R.C. (1997). Process and Structure in Leader-Member Exchange. *Academy of Management Review*, 22(2), 522-552.
- Tzeng, C.Y., Su, H.F., & Hsieh, P.C. (2005). The relationship between leadership style and group effectiveness: an example of quality control circles of hospitals in Taipei area. *Taiwan Journal Public Health*, 24, 230-238.
- Weber, M. (1947). *The Theory of Social and Economic Organization*. Henderson AM, Parsons T (Eds). New York: Free Press.
- Wu, C.C., & Hong, K.Y. (2005). A Preliminary Exploration of the Conceptual Connotation of Military Virtue Leadership. *Fu Hsing Kang Academic Journal*, 84, 25-54.
- Wu, C.H., Lin, M.L., & Li, J. (2022). Using Multiple Criteria Decision Analysis to Explore the Decisive Factors of Port Logistics Service Quality. *Journal of Management and Information*, 27, 153-220.
- Wu, H.P., Lu, L., Ku, C.C., & Chang, Y.Y. (2010). The associations between transformational leadership behaviors and subordinates' work stress and supervisor satisfaction. *Chung Hua Journal of Management*, 11(2), 1-30.
- Wu, H.T., & Chung, M.H. (2011). The Causality among Role Perception, Job Involvement and Professional

- Growth. *Bulletin of Educational Psychology*, 43(2), 419-438.
- Wu, K.J., Liao, C.J., Tseng, M.L., & Chiu, A. S. F. (2015). Exploring decisive factors in green supply chain practices under uncertainty. *International Journal Production Economics*, 159, 147-157.
- Yan, H.D., Wu, C.Y., & Lin., R.F. (2018). Social Entrepreneurship and Charismatic Leadership: Master Cheng Yen and Tzu Chi Foundation. *International Journal of Innovation and Regional Development*, 8(2), 136-158.
- Yeh, S.P., & Lin, Y.W. (2013). The Multi-level Factors of Employee Health Behavior: Team Healthy Climate and Supervisor Charismatic Leadership. *Journal of Health Management*, 11(1), 85-98.
- Yeh, T. M., & Huang, Y. L. (2014). Factors in determining wind farm location: Integrating GQM, fuzzy DEMATEL, and ANP. *Renewable Energy*, 66, 159-169.
- Yukl, G. (1989). Managerial Leadership: A Review of Theory and Research. *Journal of Management*, 15(2), 251-289.
- Yukl, G. (1994) *Leadership in Organizations*. 3rd Edition, Prentice Hall. Upper Saddle River
- Zhao, C., Tian, G., Wen, Z., & Gao, X. (2021). Charismatic leadership and millennial employee innovation performance relationship mediated by employees' leadership, professional, and organizational identification. *Social Behavior and Personality: An international journal*, 49(1), e9643.
- Zhao, H., & Li, C.P. (2019). A computerized approach to understanding leadership research. *The Leadership Quarterly*, 30, 396-416.

