Chapter 12

TOO MUCH ADO ABOUT NOTHING? FUZZY MEASUREMENT OF JOB STRESS FOR SCHOOL LEADERS

Berlin Wu
Department of Math Sciences,
National Chengchi University, Taiwan
berlin@nccu.edu.tw

Mei Fen Liu
Department of Education Policy and Ad,
National Chinan University, Taiwan
molly@mail.ksps.tcc.edu.tw

In such a globalised era that accompanied with dramatically competitive waves, schools leaders have drawn more and more stress on their jobs. This chapter is aimed at analysing and evaluating job stress factors of school leaders. We present the assessment program by using the Fuzzy Delphi method and fuzzy questionnaire sampling survey. We proposed the index of job stress of school leaders by the use of fuzzy evaluation methods as well as soft computation. From the empirical study, we can see that the three dimensions with eight indicators can explain the state of school leaders' pressure very well. The proposed index of job stress for school leaders shows an efficient index in the job stress research.

Keywords: Fuzzy evaluation; fuzzy set theory; job stress; school leaders.

1. Introduction

Measuring the stress indicator is a popular topic in the behaviour science. There is a lot of literature on the discoursing evaluation

methods as well as the measurement process about school leaders' job stress.

Takao *et al*. (2006) indicated that as job stress now is one of the biggest health-related problems in the workplace, many education programs for supervisors have been conducted to decrease job stress. It stated a possible useful effect of supervisor education on the psychological problems and job performance of subordinates. This effect may be different according to specific groups.

Vetter (1977) argued that school leaders occupy vertex positions, and like all high level executives, they are subject to fierce pressures and stresses. As is the principal, so is the school (Valentine and Bowman, 1991). Esp (1981) addressed that recruitment of headmasters is hard, partly because the job is complex and involves pressures from different groups. Protheroe (2005) described the increasing pressures on principals to initiate rapid and significant change. Emery (2007) indicated that in the last 20 years, public education in the United States has been transformed under the pressures of high-stakes testing.

Stoelinga (2008) deemed that over time, new and experienced principals at both elementary and high schools have identified the same top challenges to improving their schools: Pressure to raise test scores quickly, recruiting and hiring teachers, social problems in the school community, difficulty removing ineffective teachers, and working with parents perceived to be apathetic. Overall, the report focuses on critical trends related to principal background and work issues, which includes time use and other challenges principals identify as most problematic.

Rooney (2003) discussed the role of principals in creating a caring community in schools. Characteristics of caring principals, information on the challenges are experienced by principals and role of principals in shielding schools from outside pressures. Auerbach (2009) stated that family and community engagement are increasingly seen as powerful tools for making schools more equitable, culturally responsive and collaborative. The commitment of school leaders is vital to school-community relations, yet is poorly documented in the literature and insufficiently addressed in training for administrators.

Hewitt *et al*. (2009) investigated why teachers, identified by their school principal as being leaders or having leadership potential, chose not to become school principals. The literature is reporting a shortage of qualified applicants for school administrative positions. The main reasons most cited by teacher leaders include testing/accountability pressures too great, job too stressful, too much time required, and societal problems make it hard to focus on instruction. The main factors for teachers choosing not to develop a career in school administration are categorised as stress and time demands are too great.

Pryor *et al*. (2004) represented that solving school problems and making policy decisions require that we anticipate how people will feel about an issue or how they will behave. School leaders must comprehend the values, attitudes, and beliefs brought to different situations.

Above all, we know in such a globalised era that accompanied with dramatically competitive waves, school leaders have paid more and more attention to their performance management and it will bring much job stress.

However, the main drawback in the conventional approach is that people use the true-false logic instead of linguistic logic to analyse human thought. In this chapter, we use interval value data and multiple concepts to measure the job stress.

There is a lack of systematic study about creating pressure indicators of school leaders. The purpose of this research is to examine the cause of relationship in three dimensions of school leaders' job-related stressors (personal dimension, campus dimension and social dimension) and eight factors(work load, role expectations, vision goal, use of resource, crisis management, policy plans, public relations, and parental expectation).

In this research, we use the concept of fuzzy statistic to explore and analyse school leaders' pressure indicators in an attempt to promote the work performance at schools. We will try to establish the school leaders' fuzzy statistical indicators of job stress. Major objectives of this research are listed as follows: (1) to understand the pressure distribution from personal, campus and social dimensions of the school leaders, (2) to establish stress indicators of school

leaders, and (3) to explore the pressure index and stress factors of school leaders.

2. Research Model and Hypothesis

2.1. *Application with fuzzy set theory and soft method*

After the research of FGRS (Fuzzy Graphic Rating Scale) presented by Hesketh et al. (1988), Costas et al. (1994) furthered to choose 100 university students as a sample of the research, they found that FGRS really fits to the feature of human psychology.

Herrera *et al*. (2000) presented the steps of linguistic decision analysis under linguistic information. Their statements believe that there are certain degrees of possibilities to express linguistics based on fuzzy number, but it should be reconsidered if the response will produce the same fuzzy number.

Liu and Song (2001) developed one type of measurement whose linguistic is similar to semantic proximity. Based on the similarity of linguistic concept, they presented a formula of fuzzy association degree. They used the information of botany as an example to illustrate and analyse the categorical similarity of rare plant in the ecology. Carlsson and Fuller (2000a), Carlsson and Fuller (2000b), Chiang *et al*. (2000), Herrera *et al*. (2000), Dubois and Prade (1991) discussed many concepts about the computation of fuzzy linguistic and these concepts were worthy to broadcast.

Usually, more extensive sources of work stress come from the pressure content of school leaders through the literature review, pressure from three dimensions including individual, campus and social, and the weight to eight main factors. Fuzzy statistical model is built on the school leaders' pressure index. The dynamics of structure are shown in Fig. 1.

In this chapter, we will consider three dimensions of school leaders' job stress involving in indicators are: (1) Personal dimension: work load, role expectations; (2) Campus dimension: vision goal, use of resource, crisis management; (3) Social dimension: policy plans, public relations, and parental expectation.

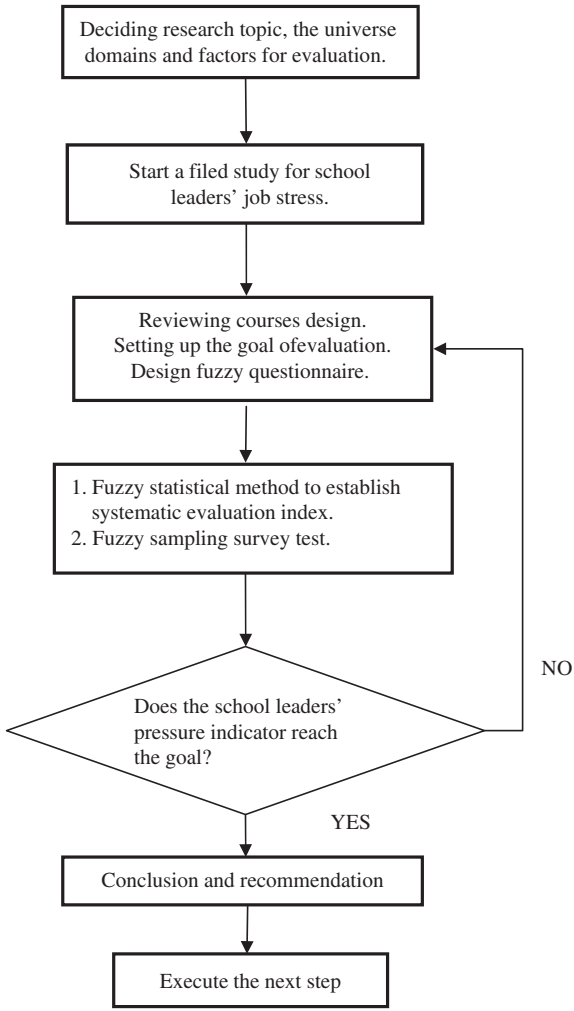

Fig. 1. A flow chart of research.

2.2. *Statistical analysis with fuzzy data*

In the research on social sciences, the sampling survey is always used to evaluate and understand public opinions on certain issues. The traditional survey forces people to choose fixed answer from the survey, but it ignores the uncertainty of human thinking. For instance, when people need to choose the answer from the survey

which lists five choices including 'Very satisfactory', 'Satisfactory', 'Normal', 'Unsatisfactory', 'Very unsatisfactory', despite of the fact that the answer to the question is continual type, we may be only allowed to choose one answer. It limits the flexibility of the answer and forces people to choose fixed answers. When the survey proposes to have the answer for sleeping hours of a person, it will be difficult to describe the feeling or understanding reasonably unless the fuzzy statistics are adopted.

Traditional statistics deal with single answer or certain range of the answer through sample survey, unable to sufficiently reflect the thought of an individual. If people can use the membership function to express the degree of their feelings based on their own choices, the answer presented will be closer to real human thinking. Therefore, to collect the information based on the fuzzy mode should be more reasonable. In the consideration for the question related with fuzzy property, the information itself had the uncertainty and fuzzy property.

Since many sampling survey is closely related to fuzzy thinking while the factor of set can be clearly grouped into many categories, it will be useful if we apply discrete fuzzy number to the public consensus. Social scientists want to study the internal motivation or feeling of personal behaviours, traditional quantifiable statistics almost require the subjects to express a single motivation or feeling and attempt to apply definitive quantified statistics to display irregular behaviours of human beings and analyse psychological measurements from a probability perspective, mathematical pattern actually simplified complex issue, nevertheless the complicated subjective point of view and thinking were usually overpass (Wu, 2005; Nguyen and Wu, 2006).

The purpose of this chapter is to develop an indicator system for the assessment of the school leaders' job stress. Using Fuzzy Theory through the Fuzzy Delphi method to form an expert questionnaire, Buckley (1985) mentioned that the fuzzy analysis does not use the exact value, but should adopt a vague message to conduct analysis, taking membership function to reflect the fuzzy messages of experts' answer, for the integration of experts' ambiguity of uncertainty levels

for the indicators and to retain information and consensus that experts provided. The questionnaire data obtained in this way can more fully show the meaning and value of the study. Zimmermann (1991) proposed that the fuzzy message refers to the semantic variables and ambiguity when the experts determine things. Thence, this study utilises the fuzzy Delphi method to solve the problem of linguistic ambiguity and avoid the researchers getting too subjective in the integration of expert opinions.

Continuous fuzzy data can be classified into several types, such as interval-valued numbers, triangular numbers, trapezoid numbers and exponential numbers etc. Most fuzzy numbers get these names from the sharp of membership function. Even though there are various types of fuzzy numbers, but we limit the discussion to three usual types: Interval-valued numbers, triangular numbers, and trapezoid numbers here. The definitions of the three types of fuzzy data are given as follows.

Definition 2.1. *A fuzzy number $A = [a, b, c, d]$, defined on the universe set U of real number R with its vertex $a \leq b \leq c \leq d$, is said to be a trapezoidal fuzzy number if its membership function is given by:*

$$u_A(x) = \begin{cases} \dfrac{x-a}{b-a}, & a \leq x \leq b \\ 1, & b \leq x \leq c \\ \dfrac{d-x}{d-c}, & c \leq x \leq d \\ 0, & \textit{otherwise} \end{cases}.$$

When $b = c$, A is called a triangular fuzzy number; when $a = b$ and $c = d$, A is called an interval-valued fuzzy number.

Definition 2.2. *Fuzzy expected values*

Let $A_i = [a_i, b_i, c_i, d_i]$ be a sequence of random trapezoid fuzzy sample on U. Then the fuzzy expected value is defined as $E(X) = \left[\frac{1}{n}\sum_{i=1}^{n} a_i, \frac{1}{n}\sum_{i=1}^{n} b_i, \frac{1}{n}\sum_{i=1}^{n} c_i, \frac{1}{n}\sum_{i=1}^{n} d_i\right]$.

2.3. *Correlation with fuzzy data*

For the interval valued fuzzy number, we need to take out samples from population X and Y. Each fuzzy interval data for sample X centroids has $x_i\, x_i$ and for sample Y has centroid y_i. For the interval data, we also have to consider whether the length of interval fuzzy data are similar or not. In Mr. Smith's example, if the correlation between the expected salary and working hours are high, then we can expect two things: (1) The higher salary the new employee expects, the more working hours he can endure; (2) The wider the range of the expected salary, the wider the range of the working hours should be. However, how should one combine the information from both centroid and length? If they are combined with equal weight, it is possible that the combined correlation would exceed the boundaries of 1 or -1. In addition, the effect of length should not be greater than the impact of centroids. In order to get the rational fuzzy correlations, we use natural logarithms to make some adjustments.

Definition 2.3. *Let* $(X_i = [a_i, b_i, c_i, d_i],\ Y_i = [e_i, f_i, g_i, h_i]; i = 1, 2, \ldots n)$ *be a sequence of paired trapezoid fuzzy sample on population* Ω *with its pair of centroid* (cx_i, cy_i) *and pair of area* $\|x_i\| = area(x_i)$, $\|y_i\| = area(y_i)$.

$$
\begin{aligned}
cr_{xy} &= \frac{\sum_{i=1}^{n} (cx_i - \overline{cx})(cy_i - \overline{cy})}{\sqrt{\sum_{i=1}^{n} (cx_i - \overline{cx})^2}\sqrt{\sum_{i=1}^{n} (cy_i - \overline{cy})^2}}, \\
ar_{xy} &= \frac{\sum_{i=1}^{n} (\|x_i\| - \|\overline{x}_i\|)(\|y_i\| - \|\overline{y}_i\|)}{\sqrt{\sum_{i=1}^{n} (\|x_i\| - \|\overline{x}_i\|)^2}\sqrt{\sum_{i=1}^{n} (\|y_i\| - \|\overline{y}_i\|)^2}},
\end{aligned}
\tag{2}
$$

Then fuzzy correlation is defined as:

$$FC = \beta_1\, cr_{xy} + \beta_2\, ar_{xy}, (\beta_1 + \beta_2 = 1).$$

We choose a pair of (β_1, β_2) depend on the weight of practical use. For instance, if we think the location correlation is much more important than that of e scale, $\beta_1 = 0.8, \beta_2 = 0.2$ will be an appropriate choice.

Example 2.1. Suppose we have the following data as shown in Table 1.

Table 1. Numerical example for interval-valued, triangular and trapezoidal fuzzy data.

	X			Y		
Student	Data	Centroid	Area (length)	Data	Centroid	Area (length)
A	[23,25]	24	2	[1,2]	1.5	1
B	[21,23,26]	23.3	2.5	[0,2,3]	1.7	1.5
C	[26,27,29,35]	28.3	5.5	[0,1]	0.5	1
D	[28,30]	29	2	[1,2,4]	2.3	1.5
E	[25,26,28,35]	28.5	6	[1,2,3,4]	2.5	2
(Fuzzy) Mean	[24.6, 25.2,27,30.2]	26.62	3.6	[0.6,1.4,2.2,2.8]	1.7	1.4

Table 2. Correlations with different combinations of β_1, β_2.

(β_1, β_2)	(1,0)	(0.9, 0.1)	(0.8, 0.2)	(0.7, 0.3)	(0.6, 0.4)	(0.5, 0.5)	(0.4, 0.6)	(0.3, 0.7)	(0.2, 0.8)	(0.1, 0.9)	(0,1)
	0.17	0.19	0.2	0.22	0.23	0.25	0.26	0.28	0.29	0.31	0.32

In this case, the correlation between the two centroids is:

$$cr_{xy} = \frac{\sum_{i=1}^{n} (cx_i - 26.62)(cy_i - 1.7)}{\sqrt{\sum_{i=1}^{n} (cx_i - 26.62)^2}\sqrt{\sum_{i=1}^{n} (cy_i - 1.7)^2}} = 0.17$$

$$ar_{xy} = \frac{\sum_{i=1}^{n} (\|x_i\| - 3.6)(\|y_i\| - 1.4)}{\sqrt{\sum_{i=1}^{n} (\|x_i\| - 3.6)^2}\sqrt{\sum_{i=1}^{n} (\|y_i\| - 1.4)^2}} = 0.32,$$

Table 2 is a list of correlations with various combinations of (β_1, β_2).

2.4. *Modelling stress index*

In order to get a more appropriate measure of the job stress, we evaluate the job stress of our subjects by fuzzy estimation method. The detailed valuation steps are as follows. The stress for school leaders come from three dimensions: Personal, campus, and society.

A trapezoid fuzzy set can be viewed as a continuous fuzzy set, which further represents uncertain events. When a sample of trapezoiddata is presented, we are interesting in scaling its value on the real line. In some practical applications, however, it is reasonable to consider, instead of the original class of all linear re-scalings, a more general class of nonlinear transformations between scales. For example, the energy of an earthquake can be described both in the usual energy units and in the logarithmic (Richter) scale. Similarly, the power of a signal and/or of a sound can be measured in watts and it can also be measured in the logarithmic scale, in decibels.

When we consider the reasonable and meaningful conditions to map trapezoid-data into the real line, we need to identify two conditions. This means that the transformation data should be (1) finite-dimensional, (2) the dependence on these parameters should be smooth (differentiable). In mathematical terms, this means that our transformation group is a Lie group.

Once such a transformation is selected, instead of the original trapezoid-data, we have a new value $y = \mathrm{f}(x)$. In the ideal situation, this new quantity y is normally distributed. (In practice, a normal distribution for y may be a good first approximation.) When selecting the transformation, we must take into account that, due to the possibility of a rescaling, the numerical values of the quantity x is not uniquely determined.

Definition 2.4. *Scaling for a trapezoid fuzzy number on R.*

Let $A = [a, b, c, d]$ be a trapezoid fuzzy number on U with its centroid $(cx, cy) = (\frac{\int x u_A(x) dx}{\int u_A(x) dx}, \frac{\int \frac{1}{2}(u_A(x))^2 dx}{\int u_A(x) dx})$. Then the defuzzification number RA of $A = [a, b, c, d]$ is defined as:

$$RA = cx + \left(1 - \frac{\ln(1 + \|A\|}{\|A\|}\right),$$

where $\|A\|$ is the area of the trapezoid.

Note that for convenience we will write $RA = \frac{a+b+c+d}{4}$, if A is a trapezoid; $RA = \frac{a+b+c}{3}$, if A is a triangle; $R(A) = \frac{b+c}{2}$, if A is an interval.

Example 2.2. Let $A_1 = [2, 2, 3, 3]$, $A_2 = [1, 1, 4, 4]$, $A_3 = [1, 2.5, 2.5, 4]$, $A_4 = [1, 2.5, 2.5, 8]$, $A_5 = [1, 2, 3, 4]$, $A_6 = [1, 2, 3, 8]$. Then:

$$RA_1 = 2.5 + \left(1 - \frac{\ln(1+1)}{1}\right) = 2.5 + 0.3069 = 2.8069,$$

$$RA_2 = 2.5 + \left(1 - \frac{\ln(1+3)}{3}\right) = 2.5 + 0.5379 = 3.0379$$

$$RA_3 = 2.5 + \left(1 - \frac{\ln(1+1.5)}{1.5}\right) = 2.5 + 0.3891 = 2.8891,$$

$$RA_4 = 3.83 + \left(1 - \frac{\ln(1+3.5)}{3.5}\right) = 3.83 + 0.5703 = 4.3,$$

$$RA_5 = 2.5 + \left(1 - \frac{\ln(1+2)}{2}\right) = 2.5 + 0.4507 = 2.9507,$$

$$RA_6 = 3.79 + \left(1 - \frac{\ln(1+4)}{4}\right) = 3.79 + 0.5976 = 4.3876.$$

In this chapter, we investigated the transaction pressure under the empirical studies in Taiwan. As is known to all, some of the schools are located in cities, and others are in village and even in mountains. Therefore, three typical cases in the district of Taiwan are selected by the rank of population.

Let:

$$S = P^{w_1} \cdot C^{w_2} \cdot O^{w_3},$$

where S = the total stress, P = stress comes from the personal reason, C = the stress comes from the campus, O = stress comes from the society; P, C, O are interval values between (0,1); w_1, w_2, w_3 ($w_1 + w_2 + w_3 = 1$), stand for the multiplicative weight.

Then we can get the assessment indicator system structure as Fig. 2.

3. Empirical Study

In this study, the Fuzzy Delphi method was used. First, we selected eight senior principals composed of the panel of expert judges.

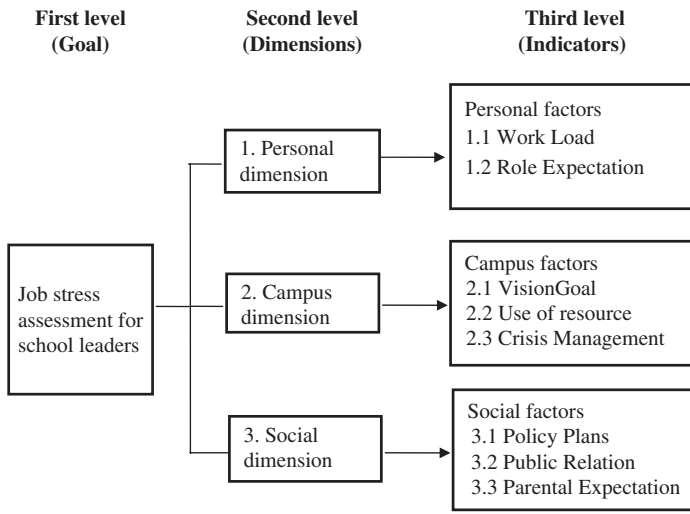

Fig. 2. Index system structure of job stress for school leaders.

The consensus of the panel of expert judges confirmed the relatively fuzzy number for the fuzzy semantic measuring scales. The panel of expert judges expressed their views for the importance of the second level-dimensions and the third level-indicators of assessment system and decided the weight of the assessment dimensions and indicators, in order to construct and develop an assessment indicator system.

3.1. *Fuzzy questionnaires*

In the field of study, we collect 20 school leaders' responses to the information. Ages from 30 to 60, sex is male and female with a frequency 11 and 9 respectively. Most schools are around at the countryside. Descriptive statistics of the sample structure are given in Table 3.

Table 3 gives backgrounds information on the 20 respondents, including gender, age, years of service as a principal, highest level of education, and school size. Out of 20 participants, males were the majority, accounting for 55%, more than a half of the sample; 65% were in the 40–50 years old; 60% of the respondents have been elementary school principals for more than five years; the majority

Table 3. Descriptive statistics of samples.

Background variables		Frequency	Percentage (%)
Gender	Male	11	55
	Female	9	45
Age	< 40	2	10
	40–50	13	65
	> 50	5	25
Years as a principal	< 4	6	30
	5–8	9	45
	> 8	5	15
Highest level of education	University degree	3	15
	Master degree	15	75
	Doctorate degree	2	10
School size	< 12 classes	7	35
	13–24 classes	8	40
	> 24 classes	5	15

of them have master degree, accounting for 75%; 13–24 class school size was the majority of schools, accounting for 40%.

3.2. *The experts' judgment opinion on assessment dimensions and indicators*

This study established stress index for the school leaders, we accessed eight senior excellent principals in order to establish the content of the average fuzzy weight factors. Each expert has a different opinion on the point of view of the fuzzy linguistic concept. The measure of the fuzzy linguistic scale in this study converts an interval fuzzy number measurement into a fuzzy number representative value. The eight experts' judgment opinion on the weight of the three dimensions and the eight assessment indicators were illustrated in Table 4.

From Table 4, we can see the weights of job stress for school leaders, from personal dimension, campus dimension, and social dimension, has a little difference. For the eight factors, the weighted values exhibited type of uniform distribution among the interval 0.08 and 0.16. It can be said that the school leaders have general pressure from those eight factors.

Table 4. School leader stress indicators of fuzzy weight.

Dimension	Indicators weight			Total
w_1 personal	*Work load* = 0.14	*Role expectation* = 0.13		0.27
w_2 campus	*Vision goal* = 0.16	*Use of resource* = 0.16	*Crisis management* = 0.11	0.43
w_3 social	*Policy plans* = 0.12	*Public relation* = 0.1	*Parental expectation* = 0.08	0.30

Table 5. Fuzzy correlations of three factors for leaders' job stress.

	Personal versus campus	Personal versus social	Campus versus social
Centroid correlation	0.4	0.3	0.7
Area correlation	0.2	0.3	0.2
Correlation with $(\beta_1, \beta_2) = (0.9, 0.1)$	0.38	0.3	0.65
Correlation with $(\beta_1, \beta_2) = (0.7, 0.3)$	0.34	0.3	0.55
Correlation with $(\beta_1, \beta_2) = (0.5, 0.5)$	0.30	0.3	0.45

3.3. *The relatively fuzzy numbers of fuzzy linguistic measuring scale*

Table 5 shows the fuzzy correlations of three dimensions for job stress.

From Table 5, we found that the correlations from centroid are higher than that of area correlation. Different combination of (β_1, β_2) will make a different correlation value. How to choose an appropriate pair of (β_1, β_2) can be decided from the empirical study.

3.4. *The average defuzzification values of various dimensions of assessment systems*

Table 6 illustrates the index of job stress for 20 school leaders. It shows in the analysis results that the defuzzification value is between 0.41 and 0.57 for the three dimensions and eight indicators of the assessment system, indicating that each principal pressure index is medium. It represented that the principals' stress management is good.

Table 6. Index of job stress for 20 school leaders.

Sample	Personal	Campus	Society	Index of stress
1	0.49	0.56	0.33	0.46
2	0.51	0.52	0.55	0.53
3	0.43	0.76	0.45	0.56
4	0.29	0.59	0.34	0.41
5	0.32	0.48	0.36	0.39
6	0.43	0.63	0.50	0.53
7	0.47	0.64	0.53	0.56
8	0.53	0.37	0.60	0.47
9	0.45	0.57	0.45	0.50
10	0.46	0.32	0.57	0.42
11	0.38	0.56	0.39	0.45
12	0.42	0.65	0.44	0.51
13	0.42	0.55	0.65	0.54
14	0.49	0.56	0.33	0.46
15	0.47	0.56	0.53	0.53
16	0.41	0.72	0.47	0.54
17	0.46	0.56	0.42	0.49
18	0.45	0.57	0.49	0.51
19	0.42	0.66	0.50	0.54
20	0.47	0.76	0.46	0.57

The whole results can first calculate the arithmetic mean of the indicators' values for each dimension, but avoids the value of a certain dimension being too low or equal to zero, influencing the overall results and generated errors, so the three dimensions should not use the arithmetic mean, but separately use the geometric mean of the three dimensions as the integrated stress value.

4. Conclusions and Recommendations

In this chapter, we utilise fuzzy statistical analysis and fuzzy evaluation to measure the job stress for school leaders. The evaluation model constructed three pressure dimensions including: Personal, Campus and Social; composed of eight indicators of project on pressure scale including: Work load, role expectation, vision goal,

use of resource, crisis management, policy plans, public relation, and parental expectation.

The questionnaire was divided into two phases to conduct the survey. The first stage of the Fuzzy Delphi method integrated the results of the panel of expert judges in converting the fuzzy linguistic variances into interval membership function value. The second stage developed the relative weight of assessment indicators. Table 4 shows in the analysis results that the defuzzification value is between 0.08 and 0.16 for the eight indicators of the assessment system, instruction that each of the assessment dimensions and indicators is of average importance. In the indicator weight of the assessment system, 'Vision goal (0.16)' and 'Use of resource (0.16)' attracted most experts' attention and showed the most importance, followed by the 'work load (0.14)'. The interval value of eight indicators was adopted to obtain discrete fuzzy data and established the defuzzification value for each indicator, thereby setting up the basic judgment standard of the assessment indicator system.

Table 6 shows the index defuzzification value of job stress is between 0.41 and 0.57 for the assessment system, indicating that each principal pressure index is medium. It represented that the principals' stress management is good.

The whole results can first calculate the arithmetic mean of the indicators' values for each dimension, but avoids the value of a certain dimension being too low or equal to zero, influencing the overall results and generated errors, so the three dimensions should not use the arithmetic mean, but separately use the geometric mean of the three dimensions as the integrated stress value. This study is only the first attempt to establish the assessment system for the school leaders' job pressure. For many school leaders, how to release the pressure from their jobs? It is worthy of further discussion.

We also found that interval fuzzy transformation is an interesting topic with great potential to interpret the fuzzy data. Because of vagueness and imprecision on human thinking so traditional statistics could not solve the problems in the field of social sciences. Soft computing with fuzzy theory is a reasonable statistical method for this kind of research.

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