The Construct Validity of Organizational Structure Scale: Evidence from Malaysia

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This study attempts to examine the psychometric properties of the organizational structure construct, which integrates four subscales-centralized decision making, centralized hierarchy of authority, formalized job codification, and formalized rule observation using a Malay language version of the instrument developed by Hage & Aiken (1967). A priori proposition was made that organizational structure could be explained by the four aforementioned factors. SPSS version 14 and AMOS 16 were used to analyze the data. The results supported the hypothesis of the study that organizational structure can be measured by the four theorized factors. The findings also showed acceptable internal consistency reliability for the overall and the four specific subscales of organizational structure factor. Based on the results, it can be concluded that the Malay-translated version of the Hage and Aiken's (1967) measure can be a useful and appropriate tool in assessing the organizational structure construct.

Field of Research: Human Resource Management, Organizational Behavior

1. Introduction

The conception of the organizational structure construct has come a long way since it was first established by Porter and Lawler (1965). The term has been defined as "positions and parts of organizations and their systematically and relatively enduring relationships to each other" (Porter & Lawler, 1965, p.24). They also categorized seven interrelated factors under organizational structure. Based on Porter and Lawler's (1965) proposition, Hage and Aiken (1967) had later simplified the conceptualization of the organizational structure construct.

According to Hage and Aiken (1967), organizational structure has been defined as practices being undertaken in an organization with regard to policies, procedures, and rules. Two important features of organizational structure are formalization and centralization, which can further be subdivided into four sub-dimensions: decision-making, hierarchy of authority, job codification, and rule observation (Hage & Aiken, 1967; Hall, 1991; Matherly, 1985). Under the

formalization construct, job codification has been defined as the level to which an organization precisely spells out rules and procedures related to jobs in different situations while rule observation refers to the extent to which an organization rigidly adheres to the rules and procedures. In other words, this construct measures how far employees are supervised to ensure that they are not committing any offense against the company's rules and regulations (Hage & Aiken, 1967). Additionally, centralization deals with the amount of power distributed among employees of various positions. This variable is measured in terms of hierarchy of authority and centralized decision-making. According to Hage and Aiken (1967), the former examines the level subordinates are reliant upon their supervisors in decision-making while the latter identifies the level of employees' involvement in decisions on resource allocation and policy formation.

The measure of the organizational structure construct by Hage and Aiken (1967) has been used extensively in assessing organizational structure factors in many empirical studies in different research settings. This is due to limited instruments in the literature that holistically measure organizational structure in terms of decision-making, hierarchy of authority, job codification, and rule observation. Importantly, limited empirical scrutiny has been reported on the psychometric properties of the organizational structure instrument developed by Hage and Aiken (1967). For instance, Deewar, Whetten, and Boje (1980) Muhamad, Aizzat, and NurFitriah (2003), Muhamad, Aizzat, and NurFitriah (2008), NurFitriah, Aizzat, Muhamad, and Mohammad (2003), and Yusliza, Hazman, and Ramayah (2007) examined the reliability and validity of the organizational structure measure but results of these studies are limited to assessing the validity based on the exploratory factor analyses results. Given the aforesaid limitation, a more in-depth analysis should be conducted to investigate the psychometric properties of the organizational structure measure. This is also in accordance to the propositions by Deewar et al. (1980) and Scandura and William (2000) that besides examining the outcomes of organizational structure, attention should be focused on measurement so as to reaffirm its goodness of measure. As such, this study evaluates the psychometric properties of the organizational structure measure developed by Hage and Aiken (1967).

In the Malaysian context, with the exception of Johanim, Khulida, and Abdullah (2010), very limited studies have been conducted on the construct validity of the organizational structure measure developed by Hage and Aiken (1967). Several local studies, such as Muhamad et al. (2008), Muhamad et al. (2003), NurFitriah et al. (2003), and Yusliza et al. (2007) provided only the initial evidence of validity via exploratory factor analysis. Scholars (e.g. Deewar et al. 1980; Scandura & William, 2000) have also suggested that additional attention should be focused on a more comprehensive theoretical elucidation of the construct and its measure. In other words, construct validation is important to ensure that the results from a research can be of substantial value to the theoretical domain in the respective field. The limitation necessitates this study to take one step ahead in attempting to fill the theoretical gap.

Research Questions

The studies on organizational structure have adopted various different measures in capturing the construct. As such, there is a need to develop a more comprehensive instrument that can comprehensively grasp and explain the organizational structure factor. This study therefore seeks to gather findings based on the following research questions:

1. What is the internal consistency reliability of each dimension (i.e. decision-making, hierarchy of authority, job codification, and rule observation) in the organizational structure construct?
2. Does the organizational structure instrument have good construct validity properties to be used for future studies in Malaysia?

Objectives of the Study

The objectives of the present study were twofold: firstly, to assess the internal consistency reliability of the organizational structure dimensions and the total score, and secondly, to assess the construct validity of organizational structure utilizing exploratory and confirmatory factor analytic procedures. The construct validity of the factor was examined in terms of convergent and discriminant validity. Convergent validity was assessed by observing the values of variance extracted (VE), construct or composite reliability (CR), and standardized factor loadings in the measurement model (Hair, Black, Babin, Anderson, & Tatham, 2006). To substantiate the evidence of discriminant validity, the values of average variance extracted (AVE) between dimensions were compared to the squared multiple correlations of the two (Hair et al., 2006). The items and dimensions of organizational structure were developed and adapted based on Hage and Aiken (1967) that assessed four dimensions of the construct: centralized decision making, centralized hierarchy of authority, formalized job codification, and formalized rule observation.

2. Literature Review

The role of organizational structure as a determinant of various workplace outcomes is evident in many empirical findings. According to Porter and Lawler (1965), differences in the structure of organizations produced differences in the attitudinal and behavioral conditions of the organizational members. This is supported by empirical findings, for instance, a study conducted by Aizzat, Ramayah, and Yeoh (2006) found that formalization has a positive influence on job stress. This is due to the fact that a job that is bounded by inflexible rules and procedures poses lesser autonomy and freedom for the incumbents to perform their tasks, which will most likely lead to job stress. On the same note, Dean, Brandes, and Dharwadkar (1998) revealed that organizational formalization may aggravate organizational cynicism, which has a more deleterious effect. It starts with employees' own experience, such as lack of fair dealings, integrity, honesty, and sincerity, among the top management in introducing and enforcing rules, procedures, or policies in the organization. This precipitates feelings of distrust

and disrespect among employees towards the organization. Based on the empirical evidence, it can be summed up that organizational structure is inversely related to various positive workplace outcomes.

It is also noteworthy that organizational structure has created interest for a comparative study across sectors and cultures. Kim and Lee (2006) reported that employee knowledge-sharing capabilities differ between the two organizations because public sector managers face various organizational constraints in enhancing employee knowledge-sharing capabilities. Organizational constraints were attributed to the higher level of formalization and centralization in the public sector. In a cross-cultural study by Michaels, Dubinsky, Kotabe, and Chae (1996), it was found that formalization inversely influences role ambiguity for the Americans, but not the Japanese and Koreans. A plausible explanation for this result is because of the different work environment in the countries examined. In essence, Japanese and Korean workers are more collectivistic compared to their American counterparts, who are more individualistic. This study also reported that formalization increases organizational commitment of Korean and Japanese sales personnel because formalized rules, policies, and procedures provide adequate guidelines to employees about their work. Furthermore, if the rules were enforced fairly, employees would develop positive perceptions and attitudes towards the organization. On this basis, culture and sector factors should be taken into account by the top management in deciding the level of organizational formalization and centralization to be adopted (Agarwal, 1993; Ahrens & Chapman, 2004; Bodowes, 2002; Dixon, 1996; Emmerik & Sanders, 2004; Emmerik & Jawahar, 2005).

The moderating role of organizational structure is also evident in many empirical investigations. For instance, Tata and Prasad (2004) studied the moderating impact of organizational structure, i.e. formalization and centralization on the self-management and team effectiveness relationship. Findings show that teams with higher self-management appeared to be more effective in organizations that allow input from employees with regard to their task performance (micro-level decision-making). On the contrary, macro-level decision making does not influence the strength of self-management and team effectiveness association at any level. Findings by Tata and Prasad (2004) also suggested that there is a stronger relationship between self-management and team effectiveness in organizations that have a lower level of formalization. This indicates fewer rules, policies, and procedures allow flexibility in teams' self-management, which eventually boost teams' effectiveness. On the same note, Yagil (2002) reported that leader expert power and subordinates' job satisfaction are highly associated with lower levels of formalization and inflexibility. In fact, knowledge and skills provided by leaders are useful only if subordinates perceived its usefulness to their functioning. Interestingly, employees perceive clear, detailed, and rigid policies and procedures with regard to task and structure can be a good substitute for the role of a leader. This shows that the level of powerfulness in leaders does not guarantee high influence on employees' behavioral and

attitudinal outcomes. Instead, situational factors related to organizational structure have a more substantial impact on subordinates' attitude or behaviors.

The negative influence of organizational structure on workplace outcome is also evident in the public sector setting. For instance, Pandey and Welch (2005) reported that a high level of job codification and rule observation had resulted in a high level of work alienation among public servants. This situation has also led to the negative perception of red tape among managers. Based on the findings, Pandey and Welch (2005) summed that managers with positive work attitudes are better able to overcome the 'red-tape' constraints. This is because their level of job involvement is high compared to their counterparts with negative work attitudes. In other words, a high level of job involvement hampers work alienation, which in turn, engenders coping ability with 'red-tape' among managers. Similarly, Sarros, Tanewski, Winter, Santora, and Densten (2002) examined how leadership behavior, i.e. transformational and transactional and organizational characteristics such as centralization and formalization affect work alienation among officers in the US Fire Department. This research measures centralization in terms hierarchy of authority while formalization is broken down into rule observation and job specificity. Sarros et al. (2002) also expanded the work alienation concept by dividing it into powerlessness, meaninglessness, and self-estrangement. The findings show that hierarchy of authority exacerbates higher levels of leadership behaviors, which subsequently leads to work alienation. For this reason, managers and supervisors have to allow for empowerment in the decision-making process. This engenders a greater sense of autonomy, clarity, accomplishments, and freedom in their job (Sarros et al., 2002). In other words, leaders have to encourage participation from employees in decision making process so that the latter will find more meaning in each task that they performed.

In a similar vein, Dean et al. (1998) revealed that organizational formalization may aggravate organizational cynicism, which has a more deleterious effect on employee performance. Organizational cynicism includes destructive attitudes, emotions, and behaviors that employees have towards the top management and organization as a whole. It originates from employees' own experiences, such as lack of fair dealings, integrity, honesty, and sincerity among the top management in introducing rules, procedures, or policies in the organization. This precipitates the feelings of distrust and disrespect among employees towards the organization. Despite the findings, Dean et al. (1998) suggested that empirical investigations on the outcomes of organizational structure need to be explored to further validate the empirical evidence reported in the literature.

It is also crucial to note the importance of organizational structure in predicting different performance-related behaviors is contingent upon employees' perception towards the structure in practice (Adler & Borys, 1996; Chebat, Babin, & Kollias, 2002; Dean & Bowen, 1994; Dienfendorff, Richard, & Gosserand, 2006; DiPaola & Hoy, 2001). For instance, if employees perceive that the

organizational structure is coercive in nature that constraints their autonomy at work, they would tend to develop negative assessments towards the formalized and centralized structure. This negative perception affects employees' well-being such as low motivation and satisfaction levels, which ultimately deteriorates their job performance. Nevertheless, if employees perceive a centralized and formalized structure positively, they would find their job as more meaningful and rewarding because this situation creates more opportunities for them to cooperate with their co-workers. As such, job performance could be enhanced across all employees through effective practice of the organizational structure.

On the contrary, Kacmar, Bozeman, Carlson, and Anthony (1999) reported that a formalized and centralized structure develops a high level of organizational politics among employees. This is because they perceived that politics is important in order to influence the decision-makers i.e. the managerial level staff. To illustrate, Kakabadse, Kakabadse, and Kouzmin (1999) discovered that organizational formalization and culture may bring about extra-role behavior in terms of ingratiation or organizational citizenship behavior (OCB) among employees, depending on motive, perception of others, or both. Ingratiation is a negative behavior, such that employees exhibit OCB with some ulterior motives. This is also known as political tactics to influence their superior, with the intention of fulfilling their own personal motives. OCB, on the other hand, is a genuine extra-role or discretionary behavior that employees engage in. If managers sense that their subordinates are engaging in ingratiation, instead of OCB, they will then develop a negative perception towards the employees.

In addition, Kakabadse et al. (1999) argued that organizational formalization and centralization influence self-managed teams' effectiveness at a certain level in which too much inflexibility and decentralization will result in 'group think', which is harmful to the organization. Accordingly, Hooijberg and Choi (2001) and Johnson and Lenders (2001) suggested that some form of control and monitoring, through formalization and centralization, are required to maximize self-managed teams' performance. Likewise, Porter and Lawler (1965) and Schminke, Ambrose and Cropanzano (2000), organizational structure in practice depends upon the population size of the organization. Public service departments and agencies are large in nature and hence decision-making activities are centralized at the top management level so as to ensure limited resources in the respective organizations are being efficiently used by all of the organizational members (Moore, 1996; Porter & Lawler, 1965; Schminke et al., 2000).

Based on the evidence in the literature (e.g. Johnson & Lenders, 2001; Kacmar et al.,1999; Kakabadse et al., 1999), it can be concluded that there is no perfect organizational structure that fits all large organizations (Bozeman, 2002; Hall, 2001; Johnson & Lenders, 2001; Moore, 1996). Organizations cannot be fully centralized or decentralized, but it must be in the form of a hybrid i.e. combination of centralized and decentralized. For this reason, structure in any

large organization needs to be revised from time to time depending on changes that occur in the external and internal environment. Therefore, it is a challenge for managers to identify which structure provides most benefits to employees as well as the organization (Johnson & Lenders, 2001). According to Moore (1996) and Sharifah, Mokhtar, and Arawati (2000), the best practice in the private sector may not be suitable to the public sector in total. This is because the suitability is contingent upon various factors such as external changes in the public sector (McHugh & Brennan, 1994; Olsen & Terpstra, 1992; Porter & Lawler, 1965). This assertion provides new insight on what constitutes the most appropriate organizational structure to be adopted in the public sector.

3. Research Methodology

Procedures

Self-administered questionnaires were distributed to the respondents in nine public service agencies and departments in the northern region of Peninsular Malaysia. The researchers went to each agency and department and personally gave the questionnaires to the chief clerk of each department, whom were contacted prior to the researchers' visit. They were briefed on the research objectives and guidelines in answering the questionnaires. Questionnaires were given out to the respondents to answer 15 items on job characteristics. A total of 500 questionnaires were distributed and 268 were returned. However, only 256 questionnaires were usable for data analysis.

Measurement of Organizational Structure

Organizational structure refers to the formalization and centralization practiced by the management of an organization (Hage & Aiken, 1967). All of the items were adapted from Hage and Aiken (1967). *Decision making* (four items) assessed opportunities given to employees to involve in decision making. A sample item is "Management in this organization always seeks inputs and feedbacks from employees in the process of making important decisions." *Hierarchy of authority* consists of 4 items measured the reliance of employees upon their supervisors in making their own decisions regarding their own work (e.g. "Little action can be taken until a supervisor approves a decision.").

Job codification consists of four items examined the specifications of job descriptions or work standardization (e.g. "Most people here make their own rules on the job"). *Rule observation* (two items) measured the type of supervisions that employees get to ensure that they conform to the job codification standard. A sample item is "I feel as though I am constantly being watched to see if I obey all the rules." Centralized decision making was measured using 4 items and hierarchy of authority was measured using 5 items. Therefore, a total of 9 questions were used to measure the formalization construct. All of the items were adopted from Hage and Aiken (1967). Sarros et

al. (2002) reported that both dimensions have high reliability coefficients of 0.92 and 0.96, respectively. Aizzat et al. (2006) reported a quite high reliability coefficient of 0.87. Dewar and colleague's (1980) study examined the measurement reliability based on Hage and Aiken studies in 1964, 1967, and 1970 showed alpha values of between 0.79 and 0.96 for both dimensions.

Five items were used to measure job codification and only two items were used to examine rule observation construct. These items are adopted from Hage and Aiken (1967). Sarros et al. (2002) reported that both dimensions have moderate to high reliability coefficients of 0.76 and 0.93 respectively. Further, Aizzat et al. (2006) reported high reliability coefficient of 0.94. Dewar and colleague's (1980) study examined the measurement reliability based on Hage and Aiken studies in 1964, 1967, and 1970 showed alpha values of between 0.72 and 0.93 for both dimensions.

All items were rated on a seven-point Likert scale, namely 1=very disagree, 2=disagree, 3= slightly disagree, 4=moderate, 5= slightly agree, 6= agree, 7= very agree. To determine the score of this scale, ratings within each scale are summed and divided by the total number of items in that particular scale. Negative statement items on the instrument were reverse-coded so that a high score on the instrument indicates a high degree of formalization and centralization in the departments and agencies studied. Table 1 shows items and source of items for dimensions in organizational structure construct.

Table 1: Items and source of items for each dimension of organizational structure

Dimensions	Sources of items and operational definitions	Items
Organizational structure	Hage and Aiken (1967)	
▪ Decision making	Job incumbents' level of involvement in decision making in the organization.	1. Management in this organization does not seek inputs and feedbacks from employees in the process of making important decisions. 2. Management in this organization does not solicit inputs and feedbacks from employees especially on decisions that affect employees' services and wellbeing. 3. Employees in this organization are not encouraged to involve in decision making. 4. Employees in this organization are not given the opportunities to involve in decision making.

Dimensions	Sources of items and operational definitions	Items
▪ Hierarchy of authority	The degree to which job incumbent rely on his or her supervisor in making his or her own decisions relating to performance of his or her tasks.	1. Little action can be taken until a supervisor approves a decision. 2. A person who wants to make his or her own decision without consulting his or her supervisor will be quickly discouraged. 3. Even small matters have to be referred to someone higher up for a final answer. 4. I have to ask my boss before I do almost anything. 5. Any decision I make has to have my boss's approval.
▪ Job codification	The extent to which job descriptions and work standardizations were specified.	1. I feel that I am my own boss in most matters. 2. A person can make his or her own decisions without checking with anybody else. 3. How things are done here is left up to the person doing the work. 4. People here are allowed to do almost as they please. 5. Most people here make their own rules on the job.
▪ Rule observation	The degree to which job incumbent is supervised in conforming to the standards established in job codification.	1. The employees are constantly being checked on for rule violations. 2. I feel as though I am constantly being watched to see if I obey all the rules.

Decentering and Back-translation Process

In the decentralizing process, the original measurement was changed before it was adapted and back-translated. The purpose is to improve the translatability of the measurement whereby items that are likely to be specific to the original culture or context were removed or altered (Geisinger, 2003; Brislin, 1980). Two bilingual experts and one public service officer helped to identify some items in the measurement that need to be refined to suit the Malaysian culture and public sector context. Then, the measurement was assessed to ensure that there is no culture-specific language or content.

The organizational structure measure was translated using back-translation procedure. Following Brislin (1970) and Geisinger (2003), two different bilingual language experts were used in the back-translation process. One of the experts translated the original items to the Malay language, and another expert re-translated the translated items into the English language without having seen the original test. After that, based on Geisinger (2003), the quality of the language translation was observed in terms of how accurately the back translated measurement agrees with the original version. Then, the back translated items were discussed and verified with officers and clerical staff from the public service departments and agencies to ensure suitability of all items in the public sector context.

Another discussion was made with two human resource officers in one of the public service departments to get feedbacks on the appropriateness of items adapted and translated in measuring job characteristics of public servants. This stage is crucial to guarantee content and face validity of all items used in the study. Based on the feedbacks, several improvements were made to the items.

Analytical Procedures

Data was analyzed using Statistical Package for Social Science (SPSS) version 14 and Analysis of Moments Structure (AMOS) Version 16. The reliability and initial evidence of validity were reported based on results from Cronbach's alpha reliability and exploratory factor analysis (EFA). The EFA on the latent construct was carried out to determine if the responses gathered can be grouped according to items in each of the hypothesized dimension.

Following Byrne (2001), Hair et al. (2006), Kim and Mueller (1978), Tabachnick and Fidell (2007), and Worthington and Whittaker (2006), EFA using principal axis factoring with direct oblique rotation and *a priori* criteria of four factors was conducted to analyze factor structure of the construct. The cutoff point of 0.5 was used as the threshold to ensure practical significance for further analysis (Hair et al. 2006; Worthington & Whittaker 2006). Then, measurement model or CFA for each latent factor was examined by observing the model fit level. Based on Hair et al. (2006) and Tabachnick and Fidell (2007), convergent validity in the study was assessed by calculating the variance explained (VE) and composite reliability (CR) of each latent construct.

4. Results

The demographic profiles of the respondents were gathered in this study. Further, exploratory and confirmatory factor analyses and internal reliability consistencies and mean were employed to examine the factor structure of the job characteristics multidimensional scale using JDS.

Demographic Profiles of the Respondents

The sample consists of 61.70 percent male and 38.30 percent female. The majority of respondents, 55.08 percent were below 30 years old while 7.42 percent were above 50 years old. Given the fact that Malaysian public service departments and agencies were predominantly Malay-populated, 98.4 percent of the respondents were Malays. Only 1.2 percent and 0.4 percent were Chinese and Indian respectively.

Additionally, the majority of respondents, 34 percent were SPM holders, 22.70 percent were STPM holders, and 29.30 percent were diploma holders. The rest of the respondents or 13.7 percent were undergraduates and masters degree holders. A total of 72.2 percent of the respondents had worked in the organization for less than 10 years while 27.80 percent had worked for more than 10 years. A total of 210 respondents or 83 percent had been in the current job position for less than 10 years while the rest were more than 10 years. Finally, a vast majority of the respondents or 94.90 percent were support staffs and only 5.10 percent were professional and management staffs.

Reliability of the Instrument

Table 2 presents the results of the internal consistency reliability, mean, and standard deviation for the total score and each subscale. Cronbach's alpha values were within the ranges of 0.698 and 0.886 for all five subscales. The overall internal consistency reliability for the organizational structure scale was 0.765.

Table 2: Summary Statistics for Organizational Structure and Cronbach's Alpha

Dimensions	Items	Mean	Standard Deviation	Cronbach's alpha
Decision-making	4	4.566	0.026	0.886
Hierarchy of authority	5	5.129	0.032	0.854
Job codification	5	3.577	0.090	0.841
Rule observation	2	4.418	0.065	0.698
Overall organizational structure	16	4.414	0.452	0.765

Exploratory Factor Analysis (EFA)

EFA was conducted to examine the factorial validity of the job characteristics construct. Principal axis factoring was chosen over other methods of extraction because it is mostly used and understood (Tabachnick & Fidell, 2007). Most importantly, principal axis factoring extraction method analyzes the common or shared variance among items while unique and error variances were eliminated

(Byrne, 2005; Costello & Osborne, 2005; Hair et al., 2006; Kim & Mueller, 1978; Tabachnick & Fidell, 2007; Worthington & Whittaker, 2006). Direct oblique rotation was used because all items shared the same second-order factor and hence they are assumed to be positively correlated (Costello & Osborne, 2005; Hair et al., 2006; Tabachnick & Fidell, 2007; Worthington & Whittaker, 2006).

Based on the EFA results in Table 3, organizational structure was a four-dimensional factor, which encompasses decision-making, hierarchy of authority, job codification, and rule observation. The total variance explained for this construct was 65.355 and KMO value was 0.867. The factor loadings for all of the remaining items range from 0.579 to 0.872. To ensure good construct validity of the instruments although some items were deleted, composite reliability (CR), variance extracted (VE) values, and discriminant validity by comparing the values of average variance extracted (AVE) and squared multiple correlations (SMC) between the four dimensions were examined and reported in the subsequent section.

Table 3: Factor Loadings for Exploratory Factor Analysis of Organizational Structure Items with Principal Axis Factoring and Direct Oblique Rotation

Items	Factor 1	Factor 2	Factor 3	Factor 4
Decision making 1	0.758			
Decision making 2	0.744			
Decision making 3	0.826			
Decision making 4	0.885			
Hierarchy of authority 1		0.579		
Hierarchy of authority 2		0.615		
Hierarchy of authority 3		0.723		
Hierarchy of authority 4		0.872		
Hierarchy of authority 5		0.772		
Job codification 1			0.548	
Job codification 2			0.699	
Job codification 3			0.743	
Job codification 4			0.745	
Job codification 5			0.719	
Rule observation 1				0.721
Rule observation 2				0.722
Total Eigenvalues	3.868	2.021	1.374	1.079
Variance Explained	16.737	8.092	4.727	3.240
KMO	0.867			
Total Variance Explained	65.355			

Construct Validity of the Organizational Structure Factor

Convergent validity and discriminant validity were used to assess the construct validity of the instruments used in this study. According to Hair et al. (2006) construct validity is crucial to ensure that a set of items actually represents the theoretical latent construct these variables were designed to measure. Specifically, convergent validity identifies the proportion of variance for each factor and discriminant validity examines the extent to which an independent variable is truly distinct from other independent variables in predicting the dependent variable (Hair et al., 2006).

In addition to the standardized factor loadings in the confirmatory factor analysis, convergent validity in the present study was examined by observing the value of composite or construct reliability (CR) and variance extracted (VE) for each dimensions of job characteristics . As noted by Hair et al. (2006), CR values should be greater than 0.6 while VE should be above 0.5. CR value that is lower than 0.6 indicates that the items do not consistently measure the hypothesized latent construct and the value of VE that is smaller than 0.5 indicates that more error remains in the items than variance explained by the latent factor structure imposed on the measure (Hair et al., 2006). CR, VE, and standardized factor loadings are the indicators for convergent validity.

The rule of thumb for a good reliability estimate is 0.7 or higher, which means that all observed variables consistently represent the same latent construct. Table 4 shows the calculated composite reliability for each latent construct, which were above 0.70 and the standardized factor loadings of above 0.5 for all items. Discriminant validity was assessed by comparing the value of the average variance extracted (AVE) and the squared multiple correlations (SMC) between constructs. To assume that all independent variables were orthogonal of one another, the value of AVE should be greater than the SMC between the respective variables (Hair et al., 2006).

Table 4 illustrates the calculated CR for each latent construct. CR is an indicator of convergent validity. The rule of thumb for a good reliability estimate is 0.7 or higher, which means that all items consistently represent the same latent construct. But Hair et al. (2006) also asserted that reliability between 0.6 and 0.7 may be acceptable given that other indicators of convergent validity (i.e. standardized factor loadings in the measurement model and VE) are good, i.e. above 0.50. In this case, rule observation showed a CR value of 0.663. However, as suggested by Hair et al. (2006), these values were considered acceptable as both fulfilled the lower limit of acceptability. Table 4.10 shows the values of CR for each of the variables.

Table 4: Composite Reliability for Each Dimension in the Organizational Structure factor

Observed variables	Standardized loadings	(Sum of standardized loadings)^2	Error	Number of items	Composite reliability
Decision-making 1	0.670		0.835		
Decision-making 2	0.660		0.746		
Decision-making 3	0.890		0.285		
Decision-making 4	0.920		0.199		
Total	3.140	9.860	2.065	4	0.827
Hierarchy authority 1	0.620		0.887		
Hierarchy authority 2	0.780		0.502		
Hierarchy authority 3	0.580		1.079		
Hierarchy authority 4	0.890		0.232		
Hierarchy authority 5	0.860		0.296		
Total	3.730	13.913	2.996	5	0.823
Job codification 1	0.610		1.161		
Job codification 2	0.820		0.479		
Job codification 3	0.860		0.457		
Job codification 4	0.890		0.437		
Total	3.180	10.112	2.534	4	0.800
Rule observation 1	0.900		0.253		
Rule observation 2	0.600		0.892		
Total	1.500	2.250	1.145	2	0.663

Table 5 shows the results of the calculated variance extracted (VE) to further support the convergent validity of each construct. A variance extracted of 0.5 or higher is a good rule of thumb suggesting adequate convergence (Hair et al., 2006). In this case, latent structures of hierarchy of authority and rule observation have a VE slightly lower than 0.5. This means that on average these items have more error than variance explained by both of the constructs imposed on the respective measures (Hair et al., 2006). As suggested in the literature, measurement error may be due to psychological factors of the respondents (Bollen & Long, 1993; Byrne, 2001; Jöreskog, 1993; Schumacker & Lomax, 2004) or the items may be measuring other latents besides the hypothesized construct in the study (Kline, 2005; Maruyama, 1998; Schumacker & Lomax, 2005; Tanaka, 1993). As such, attention should be given on other indicators of construct validity to prove that the items have convergent validity.

As shown in Table 4, the standardized factor loadings for all observed variables are above 0.5 and significant ($p<0.05$). This indicated that all of the items have an acceptable convergent validity in explaining the theorized constructs (Hair et al., 2006).

Table 5 depicts the results of the calculated variance extracted (VE) to further support the convergent validity of each construct. A variance extracted of 0.5 or higher is a good rule of thumb suggesting adequate convergence (Hair et al., 2006). In this case, latent structures of hierarchy of authority and rule observation

have a VE slightly lower than 0.5. This means that on average these items have more error than variance explained by both of the constructs imposed on the respective measures (Hair et al., 2006). As suggested in the literature, measurement error may be due to psychological factors of the respondents (Bollen & Long, 1993; Byrne, 2001; Jöreskog, 1993; Schumacker & Lomax, 2004) or the items may be measuring other latents besides the hypothesized construct in the study (Kline, 2005; Maruyama, 1998; Schumacker & Lomax, 2005; Tanaka, 1993).

As such, attention should be given on other indicators of construct validity to prove that the items have convergent validity. As shown in Table 4, the standardized factor loadings for all observed variables are above 0.5 and significant ($p<0.05$). This indicated that all of the items have an acceptable convergent validity in explaining the theorized constructs (Hair et al., 2006).

Table 5: Variance Extracted (VE) for Each Dimension in the Organizational Structure Factor

Observed variables	SMC	Error	Number of items	Variance Extracted
Decision-making 1	0.442	0.835		
Decision-making 2	0.434	0.746		
Decision-making 3	0.800	0.285		
Decision-making 4	0.855	0.199		
Total	2.531	2.065	4	0.551
Hierarchy authority 1	0.379	0.887		
Hierarchy authority 2	0.611	0.502		
Hierarchy authority 3	0.333	1.079		
Hierarchy authority 4	0.794	0.232		
Hierarchy authority 5	0.734	0.296		
Total	2.851	2.996	5	0.488
Job codification 1	0.369	1.161		
Job codification 2	0.670	0.479		
Job codification 3	0.736	0.457		
Job codification 4	0.784	0.437		
Total	2.559	2.534	4	0.502
Rule observation 1	0.422	0.253		
Rule observation 2	0.693	0.892		
Total	1.115	1.145	2	0.493

Table 6 shows the calculated values of average variance extracted (AVE) to support discriminant validity for the constructs. This test was done by comparing the VE for any two constructs with the square of the correlations estimates between these two constructs. The former should be greater than the latter to provide good evidence of discriminant validity (Hair et al., 2006).

As indicated in Table 6, values of AVE between all constructs were greater than the squared correlation values between them. Thus, this shows support for

discriminant validity among the independent variables. In other words, all dimensions in organizational structure and job characteristics were orthogonal of one another in predicting work involvement and job performance of the public servants in this study.

Table 6: Correlations, Correlation Squared Matrix, and Average Variance Extracted (AVE) of Dimensions in the Organizational Structure Factor

	Decision making	Hierarchy of Authority	Job Codification	Rule Observation
Decision- making	1.00			
Hierarchy of Authority	0.350	1.00		
	(0.123)			
	0.520			
Job Codification	0.152	-0.523	1.00	
	(0.023)	(0.274)		
	0.527	*0.500*		
Rule Observation	0.528	0.345	0.095	1.00
	(0.279)	(0.119)	(0.009)	
	0.522	*0.491*	*0.498*	

Note: Squared correlation values presented in parentheses and AVE values in italics.

The First-Order and Second-Order Measurement Model for the Organizational Structure Factor

The measurement model was observed for overall fitness by referring to other fit indices as suggested by Byrne (2001), Kline (2005), Schumacker and Lomax (2005), and Tabachnick and Fidell (2007). The fit indices reported in this study were the Root Mean Square Error of Approximation (RMSEA) and Root Mean Square Residual (RMR) for model fit, the Tucker-Lewis Index (TLI) and the Comparative Fit Index (CFI) for model comparison, and the Normed Chi-Square (NC) for model parsimony (Byrne 2001; Hair et al. 2006; Schumacker & Lomax 2005; Tabachnick & Fidell 2007; Tanaka 1993). To indicate that the model is adequately fit, the cutoff values are 0.90 or higher for CFI and TLI (Byrne 2001; Kline 2005; Schumacker & Lomax 2005; Tanaka 1993), 0.08 or lower for RMSEA, and 0.10 or lower for RMR (Byrne 2001; Kline 2005; Schumacker & Lomax 2005; Tanaka 1993). The acceptable range for normed chi-square was 1 to 5 (Schumacker & Lomax 2005).

A total of 16 items of organizational structure measure were subjected to confirmatory factor analysis. The first order measurement model showed good fit with TLI= 0.931, CFI= 0.945, RMSEA= 0.074, RMR= 0.109, normed chi-square= 2.415 (χ^2 = 200.471, df= 83, p= 0.000). The factor loadings ranged from 0.58 to

0.92 and were significant at $p<0.05$ (t-values ranging from 5.547 to 13.959). Therefore, convergent validity was established for this measurement model. Likewise, the second order measurement model also demonstrated good fit with TLI= 0.910, CFI= 0.935, RMSEA= 0.084, RMR= 0.031, normed chi-square= 4.753 (χ^2 = 66.536, df= 14, p= 0.000). The standardized factor loadings ranged from 0.738 to 0.910 and all were significant at $p<0.05$ (t-values ranging from 10.364 to 14.232). This shows support for the convergent validity of the model.

The model fit statistics comparing both factor models are presented in Table 7. The results indicated that the two measurement models for the job characteristics construct met the criteria for good fitting models. The second order factor reproduced similar results to the earlier first order factor. This finding suggests for validity and utility of the first order and second order measurement model of the Hage and Aiken's tool in assessing organizational structure factor.

Table 7: Model fit statistics for each hypothesized measurement model

Model	df	χ^2	p	χ^2/df	RMSEA	RMR	TLI	CFI
First-order	83	200.471	0.000	2.415	0.074	0.109	0.931	0.945
Second-order	16	66.536	0.000	4.753	0.084	0.091	0.910	0.935

5. Discussions, Implications, and Conclusion

This study evaluated the construct validity of the organizational structure measure, which consists of centralized decision-making, hierarchy of authority, job codification, and rule observation. This instrument was adapted from Hage and Aiken (1967), which has been considered as a widely-used instrument of organizational structure. However, limited empirical evidence on psychometric properties of the measure have been reported because most studies (e.g. Aizzat et al., 2006; Conner & Douglas, 2005; Dean et al., 1998; Michaels et al., 1996; Kim & Lee, 2006; Muhamad et al., 2003; Muhamad et al., 2008; NurFitriah et al., 2003; Pandey & Welch, 2005; Tata & Prasad, 2004; Pandey & Welch, 2005) are more interested in examining the outcomes of organizational structure. Although some studies attempted to explore the psychometric properties of the measure (e.g. Deewar et al., 1980), findings on empirical validity in such studies were limited to evaluating the internal consistency reliability using Cronbach's alpha values and convergent and discriminant validity using median inter-item correlation. Deewar et al. (1980) strongly suggested the need for researchers to continuously assess the construct validity of the organizational structure instrument so as to ascertain its goodness of measure and that valid research results are produced. Therefore, this study fulfilled the gap by utilizing a more rigorous approach in investigating the psychometric properties of the organizational structure measure. Specifically, exploratory and confirmatory factor analyses were conducted to assess construct validity in terms of convergent, discriminant, and nomological validity of the instrument.

The results from the exploratory and confirmatory factor analyses supported the four empirical dimensionalities of the organizational structure construct as posited by Hage and Aiken (1967) in their seminal work. All items loaded on the hypothesized factor, indicating a support for convergent validity. Besides that, findings of this study also reported good to acceptable levels of composite reliability for all dimensions in the construct ranging from 0.663 to 0.827. The value of variance extracted for each dimension was also found to be within the lower acceptability range, lending support for convergent validity of the measure. The re-specified measurement model for organizational structure also showed support for the fitness of the measure to the data collected. Most importantly, all of the standardized factor loadings for items in the measure were above 0.5 and significant, lending the evidence of convergent validity.

The evidence of construct validity of the organizational structure measure was supported in this study. In other words, the Malay-translated version of the organizational structure measure developed by Hage and Aiken (1967) can be used in the Malaysian public sector due to the evidence of construct validity of all items in the measure. Such findings suggested acceptable reliability and validity of the instrument. In other words, all items loaded and measured the purported dimensions in the measurement model. Further, confirmatory factor analysis provided the evidence of construct validity based on tests of significance and assessment of the measurement model fit. Exploratory and confirmatory factor analyses results supported four-dimensionality of the organizational structure measure. This indicated that the Malay-translated version of this instrument supported the four theorized factors in the original version of Hage and Aiken's (1967) organizational structure measure.

It is also crucial to note that the evidence of good construct validity of Hage and Aiken's (1967) organizational structure measure was attributed to the rigorous procedures undertaken to ensure content validity of the instrument. This is because content validity ascertained that each item truly represents the hypothesized latent factor based on the seminal work of the original author and the researcher's own judgment of the items. Following Geisinger (2003) and Brislin (1980), decentralization procedure was conducted in which culture-specific or sector-specific questions were altered based on researcher's own assessment of the items in order to suit the public sector and the Malaysian context. Then, based on Brislin (1970), Geisinger (2003), and Werner and Campbell (1970), the back-translation process was done by two bilingual experts to translate and re-translate all items. Finally, the researcher discussed and verified with public service officers and clerical staff on the appropriateness and usability of all items in the organizational structure measure. Given all the necessary steps taken in ensuring content validity, all of the items really measured the hypothesized dimensions in the organizational structure construct. Therefore, this has provided empirical support in terms of construct validity and usability of the measure in the Malaysian setting.

Additionally, the evidence of good construct validity for the organizational structure scale was plausibly due to the demographic factors of the respondents. Specifically, in terms of organizational tenure, public servants in this study had served for at least a year in their respective agencies or departments. As such, they may have a fairly extensive exposure on the structure of the departments and agencies. In other words, public servants in this study were knowledgeable and informed about the organizational structure adopted in the department or agency they were attached to. Therefore, the public servants were better able to respond to each item because they literally know and understand the subject being asked. Given this possible reasoning, the factor solution for organizational structure scale obtained for respondents in this study demonstrated similarity to the hypothesized factor structure as articulated by Hage and Aiken (1967).

To the best of the researcher's knowledge, only a handful of studies have been conducted to examine psychometric evidence for organizational structure scale (e.g. Deewar et al., 1980; Johanim et al., 2010; Yusliza et al., 2007). With the exception of Johanim et al. (2010), psychometric analyses reported (e.g. Deewar et al., 1980; Yusliza et al., 2007) were confined to exploratory factor analysis (EFA) and internal consistency reliability. Limited empirical evidence on construct validity does not provide strong support for usability of the instrument in the Malaysian context. According to Fried and Ferris (1986) and Kim and Mueller (1987), EFA does not provide a direct test of a specific model whereas confirmatory factor analysis (CFA) allows for a more specific hypothesis testing based on *a priori* concerning factor structure of a particular construct. This study attended to the limitation by providing evidence of robustness for organizational structure instrument in terms of construct validity and utility of the adapted and translated version. Importantly, the four-dimensional model of organizational structure was proven to be a useful and valuable instrument in the Malaysian context, particularly in the public sector setting.

One important theoretical contribution of this study would be in terms of the construct validation of the Hage and Aiken's organizational structure measure in Malay language. Based on suggestions in the literature (e.g. Deewar et al. 1980; Scandura & William, 2000), construct validation is deemed crucially important to ensure that more meaningful results could be elicited from any research. Further, construct validation could be of substantial value to the theoretical domain in the respective field. To the best of the researcher's knowledge, only a few studies ((e.g. Deewar et al., 1980; Johanim et al., 2010; Yusliza et al., 2007) had been conducted to attest the construct validity of the organizational structure measure. This is because most of the results that reported psychometric properties of organizational structure instrument were strictly based on the results of exploratory factor analysis and internal consistency reliability. Given the limited empirical scrutiny on measurement validation in the Malaysian context, this study moved one step ahead by providing the evidence of construct validity of the Malay-translated version of the Hage and Aiken's measure of organizational

structure to establish usability of the instrument in the Malaysian setting, particularly in the public service sector.

Based on the research findings and discussions of the results, it can be summed up that the four-sub-scales of the organizational structure measure can be useful in examining the organizational structure construct in the Malaysian setting. Specifically, the Malay translated version of the Hage and Aiken's instrument validly measures the four purported latent factors: centralized decision-making, hierarchy of authority, job codification, and rule observation.

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