Job Characteristics: A Validation Study in Iran

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Abstract: This investigation has been done to study the reliability and construct validity of JDS (that has been presented to measure 5 job characteristics including: Skill variety, task identity, task significance, autonomy and feedback) with a sample size of 942 respondents in Iran organizations environment. A result of the study has provided sufficient empirical support for the reliability and validity of JDS in measuring 5 job characteristics. JDS reliability and 5 job characteristics are at an acceptable level and items of each characteristic have internal coherence and consistency. Exploratory factor analysis with principal component method showed a 5 factor structure (ordered by autonomy, task identity, task significance, feedback and skill variety) of the JDS and the confirmatory factor analysis has confirmed exploratory factor analysis results. Especially multi-fitted parameters suggests a very good fit of 5 jobs factors with the data collected in Iran organizational environment. For ensuring construct validity of confirmatory factor analysis, convergent validity and discriminate validity were studied and obtained results show the consistency and convergence of items in measuring relevant latent construct and distinction of 5 job characteristics. As a result, JDS is an useful instrument to study the job characteristics construct in Iran.

Key words: Job characteristics, exploratory factor analysis, confirmatory factor analysis, convergent validity, discriminate validity, composite reliability

INTRODUCTION

The job characteristics model provided by Hackman and Oldham (1975, 1976, 1980) is one of the most influential theories in the field of organizational psychology that was widely accepted by theory of job design for motivating employees (Parker *et al.*, 2001; Spector, 2003) and the majority of job redesign studies has been done based on it and have studied it extensively (Loher *et al.*, 1985; Fried and Ferris, 1987; Taber and Taylor, 1990). Usually in job design research, job characteristics model is used as a framework for understanding the extent that employees should and so that their job results in motivation and satisfaction by focusing on job characteristics. When employee's productivity and output decreases, JCM can be used tore-design jobs and its contents. Because JCM emphasizes on the importance of understanding work characteristics and objective changing of job dimensions that lead to a change of job characteristics perception.

JCM consists of 5 characteristics of skill variety, task identity, task significance, autonomy and feedback (Hackman and Oldham, 1975). Job characteristics determines the extent of experienced meaningfulness of the work through skill variety, tasks identity and task significance, experienced responsibility for work outcomes through autonomy and knowledge of results

through feedback. Such psychological states shows the relationship between individual perceptions of job characteristics and various outputs such as internal motivation, high quality performance, high satisfaction, lower absenteeism and turnover (Hackman and Oldham, 1975, 1976). There are several instruments for measuring job characteristics, the most important of which are yale job inventory (Hackman and Lawler, 1971), job diagnostic survey (Hackman and Oldham, 1975), job characteristics inventory (Sims *et al.*, 1976), requisite task attributes (Turner and Lawrence, 1965), multi-method job design questionnaire (Campion and Thayer, 1985) and job characteristics instrument (Stone and Gueutal, 1985).

Literature review of job characteristics shows that in majority of researches (Pierce and Dunham, 1978; Fried and Ferris, 1987; Griffin *et al.*, 1980; Marchese, 1998), JDS provided by Hackman and Oldham (1975) has been used to measure the 5 job characteristics (skill variety, task identity, task significance, autonomy and feedback). Some reasons has been stated for such vast use of JDS, most important ones are good construct validity (Dunham, 1977b; Pierce and Dunham, 1978; Pierce *et al.*, 1986; Fried and Ferris, 1987; Marchese, 1998), appropriate validity based on conceptual definition of job characteristics (Pierce *et al.*, 1986), comprehensiveness in measuring job characteristics (Dunham, 1977a) having good predictive validity in work output (Oliver *et al.*,

2005) and shortness (Marchese, 1998). JDS can be used for following items: Identifying jobs in order to redesign to increase motivation and job satisfaction, identifying job characteristics that need to be enriched and measuring the employee's readiness to give positive response to improved jobs (Boonzaier *et al.*, 2001). In total, JCM and JDS are facilitating a process by which managers can make an optimal balance between employees and jobs. They also can measure satisfaction and performance, job nature and their lacks to increase motivation.

Although, the job characteristics model was generally accepted by job design theory field and is still used widely (Jex, 2002; Spector, 2003) and its measuring instrument (JDS) was also used widely in job redesign researches and been accepted by psychometrics experts (Griffin, 1991) but in spite of such vast and widespread use, its structure and model content and instruments have met some questions and criticism (Dunham, 1976; Pierce and Dunham, 1976; Rousseau, 1977; O'Reilly and Caldwell, 1979; Pfeffer, 1981; Bottger and Chew, 1986; Moorhead and Griffin, 2004; Gomez-Mejia *et al.*, 2007). There is not a consensus about the 5 job dimensions while these dimensions form the base of the model and it is possible that other shortcomings and defects of model are derived from inappropriate factor structure of job characteristics. Therefore, most questions, ambiguities and researches have been made regarding factor structure of JDS. There is an inconsistency in job characteristics factors measured by JDS. Some researchers have confirmed factor structure of model and some have not conformed it.

Analysis of carried out studies about JDS show that some of the researches support validity of JCM (Fried and Ferris, 1987) and factor structures of JCM has been accepted and is supported by empirical research (Fried and Ferris, 1987; Taber and Taylor, 1990). For example, studies done with the employees of insurance company (Pokorney *et al.*, 1980), public sector (Lee and Klein, 1982), national guard (Harvey *et al.*, 1985) and managers of a public service company (Johns *et al.*, 1992), confirmed 5 factor structure (Hackman and Oldham, 1975). A study in public service agencies in one of the states of Malaysia with a sample of 100 people, confirmed the 5 factor structure for job characteristics with explained variance of about 72%. Meanwhile, one question of each first 4 dimensions has been omitted due to low loadings. It means that 11 items are remained of 15 (Johanim *et al.*, 2010). Similarly, research conducted in service agencies in the Northern region of Malaysia with a sample size of 268 people showed the 5 factor structure with the explained variance of 67%. Similarly, 4 of the 15 items were excluded due to the loadings of <50.0 (Johari *et al.*, 2011).

A study done in South African organizations environment showed 5 factor structure of job characteristics (Boonzaier and Boonzaier, 1994). In addition to exploratory factor analysis, confirmatory factor analysis supports the 5 factor structure of job characteristics (Champoux, 1991). For example, studies with a sample size of 2028 employees (Harvey *et al.*, 1985) and 677 employees (Buys *et al.*, 2007) and as well as a research done in Malaysia organizations (Johari *et al.*, 2011) that have used the confirmatory factor analysis, have confirmed the 5 factor job characteristics.

Although, some studies have supported the validity of the JCM it has been widely criticized (Roberts and Glick, 1981; Salancik and Pfeffer, 1978). Investigating 10 studies about the factor structure of the job characteristics model shows that 7 studies do not confirm the 5 factor structure of JCM (Aldag *et al.*, 1981). In a comprehensive study, 5945 employees in 5 different organizations based on the type of their jobs were divided into 20 subsamples. The 5 factor solution was only consistent with 2 of 20 samples. Mainly 2-4 factor solutions were confirmed (Dunham *et al.*, 1977). Even some researchers based on their studies achieved a single factor structure for job characteristics (Stone and Gueutal, 1985). Other researchers have more recommended general solution compared to 5 factor solution based on their studies (Harvey *et al.*, 1985). Similarly, in a study with a sample of 3000 employees in a commercial company it was revealed that 83% of variance was explained by a factor named job complexity. Also by performing 4 factor solutions, task variety and independence formed one factor together (Dunham, 1976). Exploratory factor analysis with a sample size of 492 in several different industries (computer and office equipment, space, electrical and electronic equipment, oil refining, utility control and scientific photography, plastic industries, gas and aluminum production), revealed the 4 factor with 5.65% of explained variance. Autonomy was deleted because its items were combined with skill variety and task identity dimensions (Hunter, 2006). Some other researches reached 4 factor structures for job characteristics too. Autonomy and skill variety were combined (Dunham *et al.*, 1977). Therefore it is concluded that in job characteristics model, skill variety and autonomy dimensions overlap each other (Pierce and Dunham, 1976). In another study with a sample size of 6930 employees in 876 occupations in 56 organizations, 3 factor structure was confirmed. Task significance, skill variety and job autonomy dimensions formed a single factor and it was the best fit for the model. It means that the model includes 3 factors: Feedback, task identity and 3 elements (task significance, skill variety and autonomy)

in 1 factor. Review of studies on job characteristics model (Singh, 1998; Bhuain and Menguc, 2002; Menguc and Bhuain, 2004; Ramaswami *et al.*, 1933) in marketing and sales shows that task significance is not included in job characteristics structure. Even in some of these studies (Katsikea *et al.*, 2011), not only job significance but also job identity has been removed from job characteristics. On the other hand, a study whose samples were middle managers confirmed the 5 factor structure for job characteristics with a difference that this structure only included 3 of 5 primary factors (Pokorney *et al.*, 1980). Even, some studies reached the 6 factor structure. The 6 factor was formed of questions with negative item accompanying primary 5 factor structure (Idaszak *et al.*, 1987; Kulik *et al.*, 1988).

Various reasons have been mentioned for these different findings in factor structure of job characteristics. A number of studies showed that negative questions in the JDS (Hackman and Oldham, 1975) are one of the reasons that causes problems to factor structure of job characteristics (Cordery and Sevastos, 1993; Harvey *et al.*, 1985; Idaszak *et al.*, 1988; Idszak and Drasgow, 1987; Kulik *et al.*, 1988). Such negative questions cause other factors to exist besides the 5 primary factors (Harvey *et al.*, 1985; Idaszak and Drasgow, 1987). But researches show that education and understanding influence the relationship between negative questions and factor structure of job characteristics. The structure of the job characteristics model has only been confirmed in subsamples with higher education and it was observed that the factor structure of job characteristics model was not confirmed for workers with less education and lower reading ability because answering negative questions for these people can be more difficult (Idaszak and Drasgow, 1987). Thus, researchers recommend that these questions should be re-examined and revised (Harvey *et al.*, 1985). In order to solve this problem, future researches began to revise questions and results showed that reversing the negative questions presents a better fit for 5 factor structure proposed by job characteristics theory (Cordery and Sevastos, 1993; Kulik *et al.*, 1988). Some researchers studied methodological issues based on which factor analysis for the JDS was conducted. For example, they found that sample size causes the inconsistency in factor analysis of JDS and by increasing sample size a more appropriate structure of the 5 factors of job characteristics was obtained (Kulik *et al.*, 1988; Idaszak *et al.*, 1988). It can also be mentioned about the ambiguity of factor structure of job characteristics that sample variety can influence the structure of factors through difference in level and function of job, age and position of responders

(Fried and Ferries, 1986). Job characteristics vary at all the levels of the organization (Organ *et al.*, 2006) and positive impact of job characteristics on people may not be the same (Gardner and Cummings, 1988). So the employees at different job levels have different perceptions of the questions. Factor structure of JDS was also studied and compared among the professional groups and the findings in this field showed that the factor structure was different between professional groups (Lee and Klein, 1982). Moreover, some inconsistency of the factor structure of job characteristics was attributed to invalid responses due to items, such as carelessness and inattentiveness while filling in the questionnaire (Burke, 1999). Therefore, it has been recommended to identify and exclude incomplete and invalid responses from the analysis.

In total, although the review of conducted researches on job characteristics model shows that multi dimensionality of job characteristics is supported but there is little agreement about the exact number of dimensions (Fried and Ferris, 1987) and whether these dimensions and factors measure job characteristics (Johanim *et al.*, 2010) and mentioned empirical findings show the inconsistency of the factors of job characteristics measured by JDS. Because of conflicting results about JDS and the structure of its factors, it needs to be reviewed based on further studies (Taber and Taylor, 1990), different and various samples (Buys *et al.*, 2007) and related to individual differences and different organizational bases (Dunham *et al.*, 1977). Moreover, based on conducted studies validity of JDS (especially using confirmatory factor analysis) has not been studied in Iran, especially in the organization being studied. Thus, the study has been conducted to assess the construct validity of JDS through exploratory factor analysis and confirmatory factor analysis and also examining its reliability through internal consistency in organizational environment of Iran.

MATERIALS AND METHODS

Correlation research methods (covariance matrix analysis of exploratory factor analysis and confirmatory factor analysis) have been used to conduct this research. JDS (Job Diagnostic Survey) is used to collect data. JDS has been presented to measure the 5 job characteristics including: Skill variety, task identity, task significance, autonomy and feedback (Hackman and Oldham, 1975). Referring to literature review of the research that says negative items (Idaszak *et al.*, 1988; Cordery and Sevastos, 1993) disorganize the factor structure of job characteristics and especially cause other factors to exist

beside 5 factors (Idaszak and Drasgow, 1987; Kulik *et al.*, 1988), so all items were expressed as positive. Moreover, since researchers recommend that items should be re-examined and revised (Harvey *et al.*, 1985) and researches be focused on providing new question to improve the structure of the factors of JDS (Kulik *et al.*, 1988) items were revised and corrected in research literature using experts' opinions. Each of the 5 job characteristics is measured by 3 items. Skills variety is measured by the number of tasks and issues at work, required skills and complex skills. Job identity is measured by the extent to which task and task performance steps are clear, how to perform tasks and doing the whole work. Job significance is measured by the extent of job influence on others' work, job significance in organization complex and in the person's own opinion. Autonomy is measured by the extent of autonomy and independence in the way of performing tasks, choosing job performance tools and time. Feedback is measured by understanding how to do the tasks, finding performance defects before others and how good one does the work. The 5 point Likert scale including 1 (very low) to 5 (very high) has been used to measure the items.

Based on the questionnaire of job characteristics measurement, the data have been collected from the operational environment of a service organization. Since some researchers (Kulik *et al.*, 1988; Idaszak *et al.*, 1988) found that sample size has impact on the structure of job characteristics factors and increasing sample size will result in a more appropriate structure of 5 job characteristics factors, a partly large sample size has been used in the research. Based on stratified sampling, 1000 questionnaires were distributed among people and 950 questionnaires were filled out and collected.

Since, studies have showed some inconsistency of the factor structure of job characteristics is caused by invalid responses due to carelessness and neglect tin responding to the questionnaire, after surveying collected questionnaires, 8 copies were identified and excluded because of defects and invalid responses. Finally, 942 questionnaires were helpful (Burke, 1999). Demographic findings survey of respondents indicated that their age is 19-51 with a mean of 32.6 (s = 6.88). About 92% of them are men and 8% are women, 87% are married and 13% are unmarried.

Data collected by questionnaire, after the initial review and encoding were put into SPSS software environment. Then to determine the factorial validity, exploratory factor analysis and confirmatory factor analysis were used together. Although, like some of the researchers (Byrne, 2001; Kim and Mueller, 1978; Worthington and Whittaker; 2006) researchers used EFA

to determine the structure of factors or the number of underlying factors and characteristics of the research questions but EFA is not specific to hypotheses and also helps to explore the data and discover the main structures or factors. Then, using the results of exploratory factor analysis, hypotheses were tested through confirmatory factor analysis. EFA was used to determine the structure of factors and to provide greater assurance about the structure of factors caused by EFA, the CFA was used.

Meanwhile, Cronbach's alpha was used for validity or internal consistency of each of the variables and the total questionnaire. Exploratory factor analysis and validity were done by SPSS software and confirmatory factor analysis was done using LIZREL software.

RESULTS

Research findings are set in terms of reliability, exploratory factor analysis and confirmatory factor analysis.

Reliability: Reliability or internal consistency of variable done by Cronbach's alpha (Cronbach, 1951) shows that the reliability all of items is 0.81, task variety is 0.58, task identity is 0.75, task significance is 0.66, autonomy is 0.82 and feedback is 0.67. However, researchers (Kline, 1986) believe correlation of each item with the total scale in calculating Cronbach's alpha must be <0.20 but the survey of correlation of each items has a total scale <0.20 because the range of items' correlation and total items is 0.27-0.49, task variety is 0.33-0.57, identity is 0.60-0.77, task significance is 0.47-0.67, autonomy is 0.73-0.79 and feedback is 0.53-0.59.

Exploratory factor analysis: To determine whether the data collected are suitable for factor analysis, two preliminary tests: KMO (Kaiser-Meyer-Olkin) and Bartlett's Test of Sphericity were used. KMO is equal to 0.819 whereas the minimum acceptable value of this indicator is 0.50. Bartlett's sphericity test is equal to 3751.509 and is 0.0001 at significance level that suggests there is sufficient sample (Table 1). On this basis, factor analysis can be used.

Factor analysis was conducted in 2 stages: Firstly, using principal component analysis, factors were extracted

Table 1: KMO and Bartlett's test

Tests		Values
Kaiser-Meyer-Olkin measure of sampling adequacy		0.819
Bartlett's test of sphericity	Approx. Chi-square	3751.509
	df	105.000
	Sig.	0.000

Table 2: Total variance explained

Components	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)	Total	Variance (%)	Cumulative (%)
1	4.099	27.329	27.329	4.099	27.329	27.329	2.234	14.896	14.896
2	1.969	13.126	40.455	1.969	13.126	40.455	2.112	14.080	28.976
3	1.444	9.627	50.082	1.444	9.627	50.082	1.861	12.407	41.383
4	1.117	7.447	57.529	1.117	7.447	57.529	1.855	12.370	53.753
5	1.033	6.886	64.415	1.033	6.886	64.415	1.599	10.662	64.415
6	0.735	4.898	69.314	-	-	-	-	-	-
7	0.710	4.734	74.048	-	-	-	-	-	-
8	0.646	4.304	78.352	-	-	-	-	-	-
9	0.592	3.947	82.299	-	-	-	-	-	-
10	0.560	3.733	86.031	-	-	-	-	-	-
11	0.547	3.649	89.680	-	-	-	-	-	-
12	0.430	2.867	92.548	-	-	-	-	-	-
13	0.403	2.685	95.233	-	-	-	-	-	-
14	0.384	2.557	97.790	-	-	-	-	-	-
15	0.331	2.210	100.000	-	-	-	-	-	-

Extraction Method: Principal component analysis

Table 3: Rotated component matrix[a]

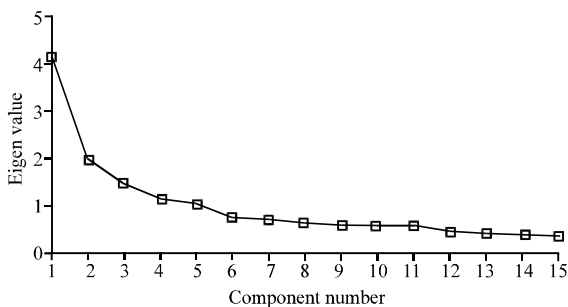| Items	Components				
	1	2	3	4	5
1	-	-	-	-	0.732
2	-	-	-	-	0.643
3	-	-	-	-	0.716
4	-	0.829	-	-	-
5	-	0.828	-	-	-
6	-	0.691	-	-	-
7	-	-	0.714	-	-
8	-	-	0.817	-	-
9	-	-	0.636	-	-
10	0.803	-	-	-	-
11	0.867	-	-	-	-
12	0.842	-	-	-	-
13	-	-	-	0.681	-
14	-	-	-	0.804	-
15	-	-	-	0.713	-

Extraction Method: Principal component analysis; Rotation method: Varimax with Kaiser normalization; [a]Rotation converged in 6 iterations

Fig. 1: Scree plot

from the correlation matrix. The 5 factors were extracted with eigenvalue above one. These 5 factors explain the items of job dimensions measurement at a variance of 64.415%. The percent of each factor's involvement in explaining the variance is: 1st factor (autonomy) 14.896, 2nd factor (job identity) 14.080, 3rd factor (job significance) 12.407, 4th factor (feedback) 12.370 and 5th

factor (job variety) 10.662 (Table 2). In addition reviewing Fig. 1, Scree test that expresses the total variance explained by each variable in relation to other variables shows that the slope of the chart declines to a great extent after the first 5 factors and this represents that 5 factors of the 15 items are basic and have a value above one for selecting the main factors. As a result of obvious changes in the slope of the chart line, Scree plot supports the 5 factor structure. This result is consistent with the application of Kaiser criterion. As one of the researchers (Dunteman, 1989) says, this criterion suggests that eigenvalue for selecting the agent should be above one.

Secondly, in order to interpret the factors, factors rotation was performed. As some researchers (Abdi, 2003) believe, rotation off actors mostly leads the structure off actors to get simplified and this will make the interpretation of the structure of factors easier. Referring to the generalization of research results, the orthogonal rotation and varimax method was used. Based on the matrix of rotated items, the content of any of the factors was extracted based on factor loading of each item in each factor (Table 3). As Table 3 shows, the range of factor loadings is 0.643-0.867 for all items and it shows items are at a high level of factor loading.

Confirmatory factor analysis: Confirmatory factor analysis was used to ensure the structure of factors brought about by exploratory factor analysis. Regarding standard factor loadings (Table 4) and fit indices of assessment model suggests that all observed variables are included in related factors and based on this construct validity or factor structure of model is confirmed. To measure assessment model fit or confirmatory factor analysis the indices, Chi-square, df, Adjusted Goodness of Fit Index (AGFI), Root Mean Squared Error of Approximation (RMSEA), Comparative Fit Index (CFI),

Table 4: Standard factor loading errors and non-standard errors, CR and variance extracted of job characteristics

Dimensions	Standardized			Estimates			CR	Variance extracted
	Loadings	t-value	Error	Loadings	Error	t-value		
Variety	0.54	14.34	0.79	0.51	0.70	18.64	0.624	0.36
	0.72	19.59	0.48	0.59	0.33	11.94		
	0.55	15.10	0.70	0.49	0.56	17.77		
Identity	0.67	19.69	0.56	0.66	0.54	18.85	0.704	0.44
	0.69	20.42	0.53	0.65	0.47	17.88		
	0.64	17.73	0.59	0.55	0.44	15.51		
Significance	0.81	23.42	0.42	0.78	0.39	10.96	0.718	0.46
	0.65	19.55	0.58	0.68	0.63	17.00		
	0.59	17.00	0.65	0.65	0.78	16.13		
Autonomy	0.86	27.14	0.26	0.81	0.23	7.62	0.794	0.57
	0.71	22.74	0.49	0.72	0.50	19.70		
	0.67	21.16	0.55	0.66	0.53	21.31		
Feedback	0.69	19.77	0.53	0.57	0.37	13.59	0.717	0.47
	0.52	15.40	0.73	0.42	0.47	19.61		
	0.83	23.91	0.38	72.00	0.29	9.73		

Non-Normed Fit Index (NNFI), Tucker-Lewis Index (TLI) and p-value were used. These indices express the extent of model fit with collected data. The Chi-square to df, <1 and it indicates perfect fit of the model (Schumacker and Lomax, 2004) and a value of >2 and limited to 5 indicates that the model does not fit with the observed data and the model must be improved (Browne and Cudeck, 1993; Arbuckle, 2003). Although, the AGFI value <0.90 and RMSEA to 0.08 of the model fit is reasonable but the AGFI equal to 0.95 or greater or RMSEA equal to 0.05 or greater shows a very good model fit (Browne and Cudeck, 1993; Verschuren, 1991). NNFI which is greatly influenced by sample size should be >0.90 to fit the model (Bentler, 1990). CFI and TLI values should be 0.90 or greater (Kline, 2005), RMR should be <0.10 (Schumacker and Lomax, 2004) and p-value should be <0.05 so that the model can be accepted. In this study, the values of all model fit indices (Chi-square = 89.38, df = 80, AGFI = 0.98, RMSEA = 0.011, CFI = 1, NNFI = 1, p-value = 0.223), suggests a very good fit of the model with the data collected.

In order to examine validity construct more closely and ensure it, convergent validity and discriminate validity are examined. To examine the convergent validity, CR (Composite Reliability) (Hair *et al*, 2006), standard factor loadings (Pedhazur and Schmelkin, 1991) and the t-value (Koufteros and Marcoulides, 2006) are used with factor loadings. CR should be >0.60. If CR is >0.60 it indicates inconsistency of observed variables in measuring the latent construct (Hair *et al.*, 2006). As Table 3 shows CR of constructs is >0.624, standard factor loadings are >0.52 and t-values are >14.34. Therefore, all these indicators present some evidence on onvergence of items or observed variables in measuring the relevant construct. Discriminate validity of constructs was conducted through calculation and comparison of AVE (Average Variance Extracted) and SC (Squared

Table 5: Correlation, correlation squared matrix and average variance extracted of job characteristics

Dimensions	Variety	Identity	Significance	Autonomy	Feedback
Variety	1.00	-	-	-	-
Identity	0.57	1	-	-	-
	(0.325)				
	0.400				
Significance	0.540	0.37	1	-	-
	(0.292)	(0.137)	-	-	-
	0.410	0.450			
Autonomy	0.320	0.460	0.42	1	-
	(0.102)	(0.212)	(0.176)	-	-
	0.470	0.510	0.520	-	-
Feedback	0.590	0.430	0.550	0.230	1
	(0.348)	(0.185)	(0.303)	(0.053)	-
	0.415	0.460	0.470	0.520	-

Correlation) and also examining the amount of correlation between the constructs. Based on experts' opinion, the AVE greater than the SC (Hair *et al.*, 2006) and the correlation <0.90 between variables (Tabachnick and Fidell, 1996) are some proofs that discriminate validity exists. If AVE is less than the SC or correlation between constructs is not 0.90 or more, it can be said there is some evidence of discriminate validity. But as Table 5 shows, the discriminate validity of constructs is supported. Because not only parallel comparison of constructs regarding the values of AVE and SC shows all values of AVE are higher than SC but also most correlation between variables is 0.59. Researchers can therefore conclude that the 5 constructs are distinct from each other.

DISCUSSION

The research has been done to study the reliability and validity of JDS in Iran organization environment. Results of the study have provided sufficient empirical support for JDS reliability and validity.

JDS reliability is 0.81 and reliability range of 5 job dimensions is between 0.58 and 0.82. Dimensions in order of reliability value are: Job variety (0.58), job significance

(0.66), feedback (0.67), job identity (0.750) and job autonomy (0.82). JDS reliability and all dimensions are at an acceptable level. Because some researchers (George and Mallery, 2003; Gliem and Gliem, 2003) consider reliability <0.5 unacceptable. However, analysis of reliability based on an acceptable level shows that JDS reliability and autonomy are at a very good level, task identity is at a good level, task significance and feedback are at an average level and task variety is at a poor level. A scan be seen, comparing dimensions based on internal consistency of relevant items shows task variety has the poorest internal consistency and job autonomy has the highest internal consistency.

Although, the reliability of task variety in the studied environment is at a poor level but it is better in comparison to the reliability of some other researches such as 0.47 (Brief and Aldag, 1976) and 0.53 (Evans *et al.*, 1979). Since it is important for construct validity to ensure that a set of items actually represents theoretical latent structure (Hair *et al.*, 2006), Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) have been used to study JDS items validity in job characteristics measurement.

After ensuring the data is proper for the EFA, conducting EFA showed the 5 job characteristics that conformed the findings of some researches (Fried and Ferris, 1987; Pokorney *et al.*, 1980; Lee and Klein, 1982; Harvey *et al.*, 1985; Taber and Taylor, 1990; Johns *et al.*, 1992; Boonzaaier and Boonzaaier, 1994; Johari *et al.*, 2011) and it did not confirm the results of some other researches (Dunham, 1976; Pierce and Dunham, 1976; Dunham *et al.*, 1977; Aldag *et al.*, 1981; Stone and Gueutal, 1985; Idaszak and Drasgow, 1987; Kulik *et al.*, 1988; Hunter, 2006). The 5 factor structure explained 64.415% of variance. The 5 job dimensions range in explaining the variance is 10.662-14.896. The dimensions in the order of lowest to highest share in explained variance are: Skill variety, feedback, task significance, task identity and autonomy. The factor loading range of all job dimensions items is from 0.636-0.867, the range of task variety characteristics is 0.643-0.732, task identity from 0.691-0.829, task significance from 0.636-0.817, autonomy from 0.803-0.867 and feedback range is from 0.68-0.804. However, according to some researchers the minimum factor loading can be 0.32 but as can be seen, the factor loading of job dimensions measurement items is 0.643 or more. Also considering acceptance level of factor loading as excellent, very good, good, average and poor (Tabachnick and Fidell, 2007), among the factor loadings 11 items were excellent (1st and 3rd, 4th and 5th, 7th and 8th, 10-12th, 14th and 15th related to task variety, task identity, task

significance, autonomy and feedback, respectively) and 4 items (2nd, 6th, 9th and 13th related to task variety, task identity, task significance and feedback, respectively) were very good.

To check the constructs validity not only exploratory factor analysis but also confirmatory factor analysis was used. Because, exploratory factor analysis is not able to test the research hypotheses and is only able to explore the hypotheses (structures or main factors) out of the data. After exploring hypotheses and factors structure, these hypotheses must be tested through confirmatory factor analysis. So CFA was used to test the results of EFA and provide more support for findings to generalize them to the society.

Performing CFA has confirmed the EFA results showing that 5 job dimensions exist. The CFA results show that all standard factor loadings are meaningful (p<0.001). In addition, multiple fit indices suggest a very good fit of 5 job factors structure with the data collected in Iran environment. CFA results of the research supporting 5 job characteristics structure confirm results of some researches (Harvey *et al.*, 1985; Champoux, 1991; Buys *et al.*, 2007; Johari *et al.*, 2011).

In addition, validity construct of CFA has been studied by convergent validity (CR, standard factor loadings and t-value) and discriminate validity (correlation and comparison of AVA and SC). The CR range of dimensions is 0.624-0.794. Dimensions in the order of CR are: Skill variety (0.624) task identity (0.704), feedback (0.717), task significance (0.718) and autonomy (0.794). Since, CR of all dimensions is >0.60, it indicates the consistency of items in the relevant hidden construct measurement (Hair *et al.*, 2006). Standard factor loadings range of skill variety is 0.54-0.72, identity is 0.64-0.69, significance 0.59-0.81, autonomy is 0.67-0.86, feedback is 0.52-0.83 and the t-value with all standard factor loadings is 14.34 or more and these two indices also confirm the convergence and favorable consistency of items in relevant latent construct measurement. Correlation threshold between 5 job dimensions is 0.59 and it's a reason that discriminate validity exists between 5 job dimensions (Tabachnick and Fidell, 1996). Moreover, comparing the AVE with the SC shows that AVE is greater than the SC in the interaction of 5 job dimensions with each other. On this basis researchers can conclude that there is discriminate validity between 5 job dimensions (Torkzadeh *et al.*, 2003; Hair *et al.*, 2006).

In Fig. 2, the research results are compared with each other based on some parameters such as reliability (Cronbach's alpha), the average factor loading of EFA, the average factor loading of CFA and CR. As you can see the parameters behavior in the 5 job dimensions is
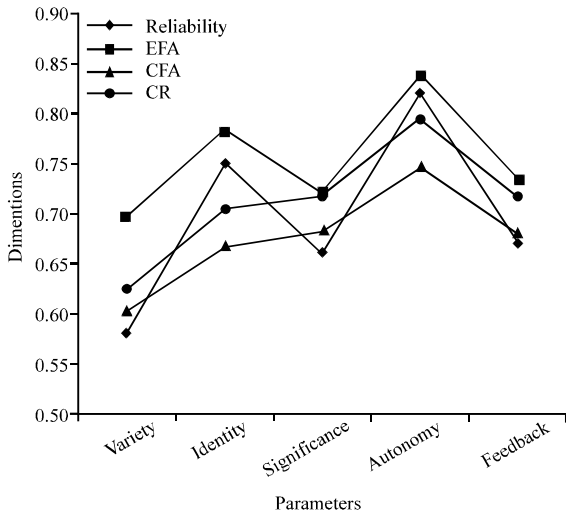
Fig. 2: Dimensions of job based on parameters such as reliability (Cronbach's alpha), average factor loading EFA, CFA and CR

generally consistent with each other. But of course, the curves of reliability and average factor loading and also CR and average factor loading of CFA are more consistent with each other. This suggests that their results confirm each other. Moreover in all parameters, autonomy is at the highest level and skill variety is at the lowest level. However, skill variety dimension is within acceptable range based on all parameters but compared with other aspects of the above parameters it is poor.

CONCLUSION

Finally, since the research results support reliability and validity of JDS in measuring 5 job characteristics in Iran environment empirically.

RECOMMENDATIONS

It is recommended to researchers to use the tools to assess and measure job characteristics and to organizations managers use it to design and reengineer jobs and ultimately job management. Therefore it's recommended that itemsof job skills be revised and improved qualitatively and quantitatively in future researches.

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