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Mediating effect of job satisfaction on the organizational commitment of civil engineers and architects

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ABSTRACT

As processes requiring the long-term collaborations of a large number of different teams, the dynamic structure of construction projects render their management difficult. Human resources constitute the backbone of the managerial processes. One of the most important factors causing difficulties in the construction industry is the frequently changing labor force due to employee turnover. Here, the work-related perceptions of employees play an important role because of their effects on employees' commitment to the workplace. The psychology of the employees depends on numerous variables. This study aims to uncover the concepts forming and affecting the work-related attitudes and perceptions of the construction industry workers and investigate the relationships among them. A multivariate model through which the effects of the personality traits, job satisfaction, professional commitment and organizational commitment of the employees were investigated and tested using the Structural Equation Modeling method and recommendations were offered in light of our results. When the relationship between the variables were investigated, the relationship between personality and organizational commitment was determined with the help of the mediating effect of job satisfaction.

KEYWORDS

Construction sector;
personality; job satisfaction;
organizational commitment;
professional commitment

1. Introduction

The construction industry has an erratic structure due to the uniqueness of each project and different resource combinations in the sector. With its erratic structure, the construction industry is one of the sectors with the highest labor turnover (Peryön Information Management Platform 2012; The Bureau of Labor and Statistics 2017; Yüksekbilgili and Akduman 2017). The studies on turnover have associated the work-related perceptions and attitudes of employees (professional commitment, job satisfaction) with their organizational commitment and, thus, their intention to leave the organization (Tett and Meyer 1993; Schwepker 2001; Saeed et al. 2014; Kweon et al. 2015; Tarigan and Ariani 2015). To enhance the job satisfaction and organizational commitment of an employee, first, their current work-related perception should be established and the factors affecting or relating to the job satisfaction and organizational commitment of the employee should be determined. There are a great number of studies focusing on different sectors (Dole and Schroeder 2001; Furnham et al. 2002, 2009; Lu et al. 2002; Meyer et al. 2002; Naquin and Holton 2002; Yeuk et al. 2002; Feather

and Rauter 2004; Erdheim et al. 2006; Vandenaabeele 2009; Fu and Deshpande 2014; Singh and Gupta 2015; Fabi et al. 2015; Mathieu et al. 2016) (Tables 1–4). Despite the personal traits-related expectations of the sector from civil engineers, the studies on the construction industry focus on the productivity of the process and not the individual psychology of the employees (Love et al. 2011).

The project-based production of the construction industry and the different combinations of construction site, project, production methods and labor create an erratic atmosphere that affect its workers. The idiosyncratic conditions of the construction industry and its high labor turnover rates necessitate a detailed investigation of the work-related perceptions and attitudes of the construction industry workers. However, the scope of the limited number of the studies specific to the construction industry was narrow (Table 5).

While studies focusing on different sectors have drawn attention to the effects of worker psychology on productivity and performance, the studies concerning the construction industry have focused on the productivity of the process (Love et al. 2011). The

Table 1. Studies on personality and job satisfaction in different sectors.

Variables	Relationships (correlation coefficients)						
	Intrinsic satisfaction		Extrinsic satisfaction		Job satisfaction		
	Furnham et al. (2002)	Furnham et al. (2009)	Furnham et al. (2002)	Furnham et al. (2009)	Dole and Schroeder (2001)	Judge et al. (2002)	Furnham et al. (2009)
Extraversion	-0.086	-0.025	0.019	0.106		0.25	0.005
Agreeableness	0.092	0.057	-0.114	0.104		0.17	0.085
Conscientiousness	0.260	0.154	0.265	0.175		0.26	0.174
Neuroticism	0.089	0.079	-0.175	0.093		-0.29	0.091
Openness to experience	0.221	-0.028	0.261	-0.052		0.02	-0.042
Personality					0.095		

Table 2. Studies on personality and organizational commitment in different sectors.

Variables	Relationships (correlation coefficients)					
	Affective commitment		Continuance commitment		Normative commitment	
	Naquin and Holton (2002)	Erdheim et al. (2006)	Naquin and Holton (2002)	Erdheim et al. (2006)	Erdheim et al. (2006)	
Extraversion	0.26	0.20	-0.29	-0.22	0.17	
Agreeableness	0.28	0.05	-0.13	0.02	0.19	
Conscientiousness	0.43	0.18	-0.13	0.21	0.04	
Neuroticism	-0.25	-0.13	0.14	0.25	0.03	
Openness to experience	0.15	-0.04	-0.29	-0.23	0.05	

Table 3. Studies on organizational commitment and job satisfaction in different sectors.

Variables	Relationships (correlation coefficients)								
	Intrinsic satisfaction		Extrinsic satisfaction		Job satisfaction				
	Meyer et al. (2002)	Fabi et al. (2015)	Meyer et al. (2002)	Fabi et al. (2015)	Yeuk et al. (2002)	Feather and Rauter (2004)	Vandenabeele (2009)	Fu and Deshpande (2014)	Mathieu et al. (2016)
Affective commitment	0.68	0.63	0.71	0.58			0.29	0.48	
Normative commitment		0.41		0.40			0.53	0.55	
Continuance commitment							0.66	0.17	
Organizational commitment					0.27	0.54		0.51	0.51

Table 4. Studies on professional commitment, organizational commitment and job satisfaction in different sectors.

Variables	Relationships (correlation coefficients)			
	Professional commitment			
	Lu et al. (2002)	Meyer et al. (2002)	Yeuk et al. (2002)	Singh and Gupta (2015)
Affective commitment		0.51		-0.25
Normative commitment				-0.31
Continuance commitment				0.09
Organizational commitment				
Job Satisfaction	0.39		0.27	

limited number of studies focusing on the personality traits and work-related perceptions of the construction industry workers are summarized below.

In their study in which the personality traits of the civil engineers working in the public sector were investigated, Johnson and Singh (1998) determined

that even the specialties within the same occupational group had created variations in personality traits. Concordantly, in their study focusing on the construction industry employees working in different departments, Carr et al. (2002) determined a relationship with the job satisfaction and personality traits of

Table 5. Studies on personality, job satisfaction and organizational commitment in the construction sector.

Reference	Sample	Independent variables	Dependent variables	Method	Relationship
Johnson and Singh (1998)	Civil engineers	Field of study-department	Personality	Questionnaire	There are differences
Carr et al. (2002)	Civil engineers and architects	Personality	Performance	Questionnaire	Related
Suveren (1998)	Construction sector	Job specifications	Job satisfaction	Questionnaire	Related
Yilmaz (1999)	Architects	Organizational structure	Job satisfaction	Questionnaire	Related
Kasapoğlu (2000)	Architects	Job specifications	Intention to leave	Questionnaire	Related
Leung et al. (2004)	Construction sector	Job satisfaction	Intention to leave	Questionnaire	Related
			OC/affective commitment	Questionnaire	Related
			OC/continuance commitment		Not Related
			OC/normative commitment		Related
		Job performance	OC/affective commitment		Related
			OC/continuance commitment		Not Related
			OC/normative commitment		Not Related
		Turnover	OC/affective commitment		Related
			OC/continuance commitment		Not Related
			OC/normative commitment		Related
		Intention to leave	OC/affective commitment		Related
			OC/continuance commitment		Related
			OC/normative commitment		Not Related
Lingard and Lin (2004)	Female construction sector employees	Age	Organizational commitment	Questionnaire	Not Related
		Career choice			Related
		Satisfaction with career progression			Related
		Job involvement			Related
		Supervisory support			Related
		Organizational climate			Related
Leung et al. (2008)	Construction sector	Job satisfaction	OC/affective commitment	Questionnaire	Related
Deshpande and Fu (2012)	Construction sector	Job satisfaction	Organizational commitment	Questionnaire	Related

OC: organizational commitment.

the employees in the planning, design and production management departments.

In their study in which the factors affecting the job satisfaction of the employees in the Turkish construction industry were investigated, Suveren (1998) reported that job satisfaction and labor productivity were increased by improving and restructuring the conditions related to work variety and task specifications.

Yilmaz (1999) investigated the relationship between organizational structure and job satisfaction in architecture offices and examined the relationships between job satisfaction and intention to leave and the two dimensions of organizational structure (centralization and formalization) and the skill variety required by the job, job autonomy and job monotony.

Kasapoğlu (2000) focused on the job dissatisfaction and intention to quit of the architects working in offices. The results revealed that the job dissatisfaction of the employees increased with increasing dissatisfaction with the fulfillment of the physiological, safety, social and esteem needs. The strongest relationship

was determined between the esteem needs and job dissatisfaction of the working architects. Esteem needs were followed by their dissatisfaction with the fulfillment of their social, physiological and safety needs, respectively. The researcher also investigated the consequences of job dissatisfaction and found a positive relationship between job dissatisfaction and intention to quit ($CC = 0.53$). In addition to job dissatisfaction, gender and job continuity affected the intention to leave. The results showed that the male employees and employees working at the project level had a higher tendency to quit. The higher tendency of the male employees to quit was attributed to more heavily assuming the family responsibility, which compels them to find better jobs. The higher tendency of the employees working at the project level to quit was attributed to the lack of continued job security, which compels architects to ceaselessly seek new jobs.

Lingard and Lin (2004) investigated the career, family and work environments determining the organizational commitment of the female employees

working in the Australian construction industry and found that career choice management, career progression satisfaction and carrier/job commitment had predictive effects on the organizational commitment of the female employees.

Leung et al. (2004) investigated the job satisfaction, organizational commitment and intention to leave of the construction industry workers and, using correlation analysis, determined that the affective commitment of the employees was related to job satisfaction ($CC = 0.54$), job performance ($CC = 0.49$), intention to quit the project ($CC = -0.46$), intention to leave the firm ($CC = -0.50$) and labor turnover ($CC = -0.27$). Moreover, while continuance commitment was positively related to the intention to quit the project ($CC = 0.37$) and intention to leave the firm ($CC = 0.26$), normative commitment was negatively related to the intention to quit the project ($CC = -0.31$) and labor turnover ($CC = -0.38$). According to the results of the study, job satisfaction had a positive relationship with job performance ($CC = 0.48$) and a negative relationship with the intention to quit the project ($CC = -0.27$) and intention to leave the firm ($CC = -0.42$). In addition to the correlation calculations, the relationships between the variables were also examined using regression and structural equation modeling. The common results of the three analyses were that affective commitment was related to high performance and job satisfaction and continuance commitment were related to intention to leave.

The above studies investigated the relationship between organizational commitment and personality traits, job satisfaction in different sectors. However, a comprehensive model that simultaneously investigates the relationship between all variables and organizational commitment in construction sector has not been determined. The model was comprehensive to allow investigating personality, professional commitment, job satisfaction and organizational commitment together and determining to what degree they affected the multivariate structure of worker psychology. The model was applied to a nationwide sample to obtain a sample reflecting the general population.

2. Personality concept

Personality is the whole of the characteristics of an individual and is a distinctive aspect of a person. A great number of personality definitions can be found in the literature, but the most pronounced denominator of these definitions is that personality is viewed

as the unique aspect of each individual. MacKinnon (1944) introduced two definitions of the personality concept. In the first definition, personality is defined from an observer's point of view as 'how a person is perceived by others', while in the second definition, personality is defined from an introspective point of view as 'how a person perceives themselves' (Hogan 2008 cited by Özcan 2011).

Despite its different definitions, psychologists accept five principles as the foundations of the personality concept. These are (Hodgetts and Heager 2008 cited by Özcan 2011) as follows.

- Personality is an organized whole; otherwise, the individual would lose their meaning.
- Personality is organized within certain patterns that are observable and measurable to a certain degree.
- Specific personality development is a product of social and cultural environments, albeit the biological foundations of personality.
- Personality has both superficial aspects and deep sources.
- Personality involves both shared and uncommon and unique qualities; people are different from each other in some aspects and similar to each other in other aspects.

2.1. Five-factor personality traits

Different researchers have developed different personality theories. Some of these theories are based on personality formation, while others are based on the manifestations of personality (Güney 2000). One of the most well-known of these theories is the Five-Factor Theory developed by Robert R. McCrea and Paul T. Costa. The five fundamental personality traits determined by McCrea and Costa (2003) using factor analysis include extraversion, agreeableness, conscientiousness (self-discipline), neuroticism (emotional instability) and openness to experience (İnanç and Yerlikaya 2008). Table 6 summarizes the five-factor personality dimensions and the traits they represent.

3. The concepts of job satisfaction, organizational commitment and professional commitment

An examination of the work-related perceptions of employees reveals that job satisfaction, organizational commitment and professional commitment have taken precedence over other related concepts. Job

Table 6. Five-factor personality traits (Burger 2006: from McCrea and Costa 1986).

Factor	Characteristics
Extraversion	Outgoing/energetic versus solitary/reserved Entertaining/serious Compassionate/reserved
Agreeableness	Friendly/compassionate versus analytical/detached Reliant/skeptical Helpful/no cooperative
Conscientiousness	Organized/unorganized Careful/careless Self-disciplined/no will
Neuroticism	Nervous/calm Insecure/secure Self-pity/self-satisfaction
Openness to experience	Dreamer/realist Creative/ordinariness Independent/conservative

satisfaction plays an important role in the motivation of an individual and is described as ‘a pleasurable or positive emotional state resulting from the appraisal of one’s job or job experiences’ (Locke 1976 cited by Yoon and Thye 2002). The Minnesota job satisfaction model comprising the intrinsic satisfaction (intrinsic satisfaction questions focus on the job itself and the feelings of an individual about the work they do), extrinsic satisfaction (extrinsic satisfaction questions focus on pay, recognition, managerial relations, promotion opportunities, management policies, and technical support) and general satisfaction (includes both dimensions) sub-dimensions was selected as the basis of this study (Çelik 2013).

Organizational commitment is described as ‘the degree to which an employee identifies with the organization and wants to continue actively participating in it... Like a strong magnetic force attracting one metallic object to another... a measure of an individual’s willingness to remain with an organization in the future’ (Davis and Newstrom 1989). The Meyer and Allen (1991) organizational commitment model comprising the affective commitment (the emotional or affective attachment of an employee to the organization), continuance commitment (focuses on employees’ estimates for the costs of leaving the organization) and normative commitment (the moral attachment of employees to the organization) sub-dimensions was selected as the basis of this study (Çelik 2013).

Job satisfaction forms the perception of an employee about their job, is affected by daily events, and not always expressive of the permanent feelings of an employee. On the other hand, organizational commitment is formed in time, manifests as perception and behavior, and expresses permanent feelings (Bakan 2011). Job satisfaction emerges immediately

after the recruitment of an employee, while organizational commitment is a process and developed in time (Şengül 2008).

Professional commitment is the importance attached by an individual to their profession (Greenhouse 1971 cited by Bakan 2011), an individual’s growing identification with their profession and the increasing importance of their profession in their lives (Morrow and Wirth 1989 cited by Bakan 2011), and the strength of the motivation of an individual to fulfill the role assigned in their profession to which they feel committed (Hall 1971; Blau 1985 cited by Bakan 2011).

4. Material and method

In the study in which the effects of personality traits, professional commitment, and work commitment factors on the job satisfaction and organizational commitment in the Turkish construction industry was investigated, a survey comprising six sections was carried out for data collection. Variables were identified considering the literature findings discussed above. To measure the personality traits of the Turkish construction industry workers, the Five-Factor Personality Traits Theory-based (extraversion, agreeableness, conscientiousness, neuroticism and openness to experience) Big Five Inventory (BFI) that was developed by John et al. (1991) and made up of 44 questions was used (John and Srivastava 1999). To measure the job satisfaction (intrinsic satisfaction, extrinsic satisfaction and general satisfaction) of the construction industry workers, the short version of the Minnesota Job satisfaction questionnaire that was developed by Weiss et al. (1967) and is made up of 20 questions was used. The 18-question organizational commitment questionnaire that comprise the affective commitment, continuance commitment, and normative commitment sub-dimensions and was developed by Meyer and Allen (1991) was used in the study. To measure the professional commitment of the construction industry workers, four questions developed using the career commitment questionnaire of Blau et al. (1993) and obtained from Cohen (2007) were used to investigate the factors affecting work commitment, 12 questions were included in the final section of the questionnaire (Appendix). A five-point Likert type scale was used for all items. Scales, recognized by various previous studies in the literature (Weiss et al. 1967; John et al. 1991; Meyer and Allen 1991; Blau et al. 1993; John and Srivastava 1999; Karaca 2001; Cohen 2007) were selected in order to structure the

Table 7. Fit indices for structural equation modeling.

Index	Normal value	Acceptable value
χ^2/sd	<2	<5
GFI	>0.95	>0.90
AGFI	>0.95	>0.90
CFI	>0.95	>0.90
RMSEA	<0.05	<0.08
RMR	<0.05	<0.08
SRMR	<0.05	<0.08
NFI	>0.95	>0.90
NNFI	>0.95	>0.90

questionnaire. According to the 31 December 2017 records of Union of Chamber of Turkish Engineers and Architects, there are 106,262 civil engineers and 50,990 architects working actively in Turkey (<https://www.tmmob.org.tr>) which sums up to 157,252 professionals in total. The questionnaire was presented online by using www.surveymonkey.com website and it was delivered to randomly selected 16,000 professionals who were members of a Building Information Centre's network. Of responses, 922 were returned during the survey. Number of respondents were satisfactory as it satisfied the smallest sample size of 400, which was recommended for the statistical reliability of questionnaire surveys within 95% confidence level (Charter and Feldt 2002; Bademci 2005).

Reliability of the scales were determined by calculating their Cronbach's alpha coefficients. In the first part of the study, exploratory factor analysis was employed using SPSS software program (SPSS Inc., Chicago, IL) and confirmatory factor analysis was employed using LISREL 9.3 software program for each scale (Yoon and Thye 2002; Ho Hung 2007; Yang and Chang 2008; Akar and Yıldırım 2008; Matzler and Renzl 2010). Research model was developed according to the previous research findings (Yoon and Thye 2002; Ho Hung 2007; Yang and Chang 2008; Akar and Yıldırım 2008; Matzler and Renzl 2010). Firstly, direct effects of variables on each other were examined. Furthermore, the mediation effects of variables were tested and the final version of model was formed in detail (Munro 2005; Schreiber et al. 2006; Şimşek 2007; Hooper et al. 2008; Schumacker and Lomax 2010; Waltz et al. 2010; Wang and Wang 2012; Çapık 2014). Fit indices for structural equation modelling are given in Table 7 (Çapık 2014; Munro 2005; Schreiber et al. 2006; Şimşek 2007; Hooper et al. 2008; Schumacker and Lomax 2010; Waltz et al. 2010; Wang and Wang 2012).

In the structural equation modeling, the path coefficients among variables are referred as effect size <0.1 for small effects; around 0.3 for medium effects and ≥ 0.5 for large effects (Şimşek 2007). In the literature, although there is no exact rule about the

threshold value required for the path coefficient to be considered as meaningful, a path coefficient above 0.1 is recommended and the ideal value is stated to be above 0.2 (Chin 1998; Shao et al. 2012 cited by Lohmöller 1989). Relations with path coefficients of 0.1 or above and *t*-value of more than 1.96 were considered to be significant during the current study.

The main model, which was formed according to the relationships between variables that were determined according to the mediation analysis results was tested by using structural equation modeling method (Figure 1). Due to the excessive number of preliminary analysis, only the results of the mediation analysis and the results of the main model are presented in detail.

Null hypotheses about direct effects of variables:

- H₀₁: Job satisfaction has a significant direct impact on organizational commitment.
- H₀₂: Personality has a significant direct impact on organizational commitment.
- H₀₃: Personality has a significant direct impact on job satisfaction.
- H₀₄: Personality has a significant direct impact on professional commitment.
- H₀₅: Personality has a significant direct impact on work commitment factors.
- H₀₆: Professional commitment has a significant direct impact on job satisfaction.
- H₀₇: Professional commitment has a significant direct impact on organizational commitment.
- H₀₈: Work commitment factors has a significant direct impact on organizational commitment.
- H₀₉: Work commitment factors has a significant direct impact on job satisfaction.

Hypothesis about mediating effects of variables:

- H₁₀: Personality has a significant indirect impact on organizational commitment through the mediating role of job satisfaction.
- H₁₁: Professional commitment has a significant indirect impact on organizational commitment through the mediating role of job satisfaction.
- H₁₂: Work commitment has a significant indirect impact on organizational commitment through the mediating role of job satisfaction.
- H₁₃: Personality has a significant indirect impact on job satisfaction through the mediating role of professional commitment.
- H₁₄: Personality has a significant indirect impact on job satisfaction through the mediating role of work commitment factors.

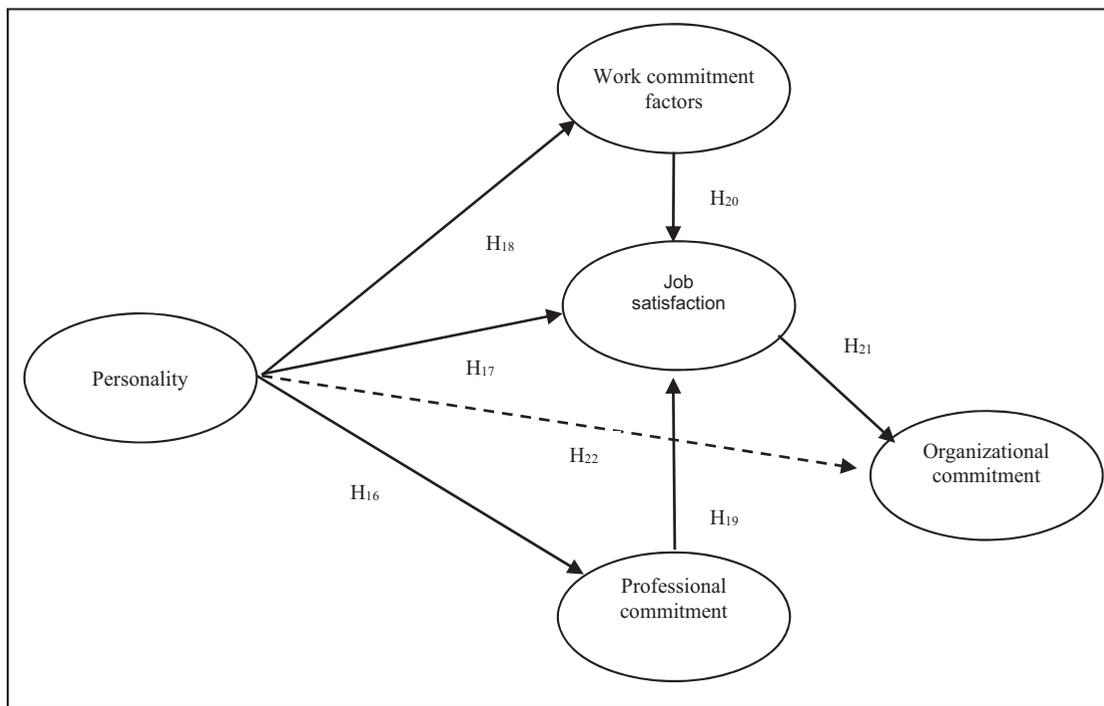


Figure 1. The main form of the research model.

Table 8. Cronbach's alpha values of variables.

Scale	Cronbach's alpha value
Personality (all)	0.750
Extraversion	0.790
Agreeableness	0.626
Conscientiousness	0.742
Neuroticism	0.799
Openness to experience	0.802
Job satisfaction (all)	0.936
Intrinsic satisfaction	0.911
Extrinsic satisfaction	0.855
Organizational commitment (all)	0.814
Affective commitment	0.849
Continuance commitment	0.787
Normative commitment	0.730
Professional commitment	0.827
Work commitment factors	0.893

- H₁₅: Personality has a significant indirect impact on organizational commitment through the mediating role of work commitment factors.

Hypothesis about main model:

- H₁₆: The personality traits of the construction industry workers positively and significantly affect their professional commitment levels.
- H₁₇: The personality traits of the construction industry workers positively and significantly affect their job satisfaction levels.
- H₁₈: The personality traits of the construction industry workers positively and significantly affect their work commitment levels.

- H₁₉: The professional commitment levels of the construction industry workers positively and significantly affect their job satisfaction levels.
- H₂₀: The work commitment levels of the construction industry workers positively and significantly affect their job satisfaction levels.
- H₂₁: The job satisfaction levels of the construction industry workers positively and significantly affect their organizational commitment levels.
- H₂₂: The personality levels of the construction industry workers positively and significantly affect their organizational commitment levels.

5. Results

The Cronbach's alpha values calculated for the personality, job satisfaction, organizational commitment and professional commitment scales and presented in Table 8. All variables and their sub-dimensions (except agreeableness with Cronbach's alpha 0.626) was above 0.7, which is generally the acceptable lower level limit in related literature (Nunnally 1978; Dexter et al. 1997; Chen et al. 2006; Munnukka 2008; Brown et al. 2009; Sidique et al. 2010; Chiou et al. 2011; Taber 2018).

The sample group included a total of 922 individuals comprising 482 (52%) architects and 440 (48%) civil engineers (Table 4). As revealed by an examination of the data given in Table 9, the ratios of the architects and civil engineers participating in the

Table 9. The professional profile of the participants.

Profile	Public		Private		Total	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Architect	96	48	386	54	482	52
Civil engineer	106	52	334	46	440	48
Total	202	100	720	100	922	100

study were close to each other both in the two sectors and in total. However, overall participation revealed a predominant participation of private sector workers with 720 individuals (78%), while public sector workers participated in the study at a relatively lower rate with 202 individuals (22%).

In the first part of the study, direct relationships between the variables, based on previous studies, were examined and the results are given in Table 10. In all the path analysis, *t*-values were found to be above 1.96 and all fit index values were in accordance with the acceptable limit values stated in Table 7. In all models, the relationships between variables were found to be in consistency with the results of the previous studies within the literature, so hypotheses 1–9 were accepted.

Results of the path analysis of the models which were formed to investigate the mediating effects of variables are given in Table 11. In all mediating analyzes, all fit index values are in accordance with the acceptable limit values specified in Table 7. Path coefficients below 0.1 are considered insignificant. When the results are examined for H_{10} , H_{11} and H_{12} hypothesis, it is observed that the path coefficients are smaller than 0.10, i.e. insignificant, for the relationships between organizational commitment and personality, professional commitment and work commitment factors. As a result, it is observed that personality, professional commitment and work commitment factors have significant indirect impacts on organizational commitment through the mediating role of job satisfaction (H_{10} , H_{11} and H_{12} hypotheses were accepted).

While obtained models based on H_{13} and H_{14} hypotheses are examined, it is observed that although there is a decrease in path coefficient values between personality and job satisfaction, the relationship is significant. Moreover, professional commitment and work commitment factors have partial mediation effect between personality and job satisfaction. In the model formed for H_{15} hypothesis, it is observed that the effect of personality on organizational commitment decreases and work commitment factors have a partial mediation effect between personality and organizational commitment.

As a result of mediating analyzes, it was observed that the personality affected the organizational

commitment through job satisfaction. On the other hand, in the model, which were tested with work commitment factors, it is concluded that work commitment has partial mediating effect between personality and organizational commitment. Therefore, a path between personality and organizational commitment is defined in the main model. Main model tested using structural equation modelling method and obtained results are given in Figure 2 and Table 12. In the model tested by structural equation modelling method, *t*-values were found to be above 1.96 and all fit index values were in accordance with the acceptable limit values stated in Table 7. Path coefficients below 0.1 are considered insignificant. In the tested model, the path between personality and organizational commitment is not significant. In accordance with the results presented in Figure 2 and Table 12, the model was re-tested without the path between personality and organizational commitment and the new results are given in Figure 3 and Table 13.

A positive and statistically significant relationship was found between personality and professional commitment (H_{16}). Moreover, significant path coefficients were found between personality and job satisfaction (H_{17}) and personality and the factors affecting work commitment (H_{18}). Personality affected professional commitment, work commitment factors and job satisfaction. Job satisfaction was positively affected by personality (H_{17}) at a low level and professional commitment (H_{19}) and the factors affecting work commitment (H_{20}) at a moderate level. Organizational commitment and job satisfaction (H_{21}) had a considerably high and positive relationship. A change in job satisfaction will also proportionately affect organizational commitment.

6. Discussion and recommendations

The positive tendency of individual psychology affects individual performance, group performance, department performance and the efficiency and the performance of the whole organization, respectively. In recent years, organizations have been aware of the existence of this cumulative effect and they have started to concentrate on the psychology of the employee in conjunction with changing personality of the employee. In the literature, the concepts of job satisfaction and organizational commitment have been studied intensively with different sample groups. However, there is not a comprehensive study analyzing the relationship between the personality,

Table 10. The results of hypothesis about direct effects of variables.

Hypothesis no	Description	Structural relations	Path coefficients	t-values	χ^2/df	RMSEA	GFI	AGFI	RMR	SRMR	CFI	NFI	NNFI
H ₀₁	Accepted	Job satisfaction → organizational commitment	0.80	36.24	2.44	0.040	0.988	0.986	0.071	0.071	0.982	0.971	0.981
H ₀₂	Accepted	Personality → organizational commitment	0.23	6.33	2.44	0.040	0.976	0.973	0.060	0.060	0.944	0.909	0.941
H ₀₃	Accepted	Personality → job satisfaction	0.31	10.11	1.99	0.033	0.983	0.981	0.589	0.589	0.975	0.952	0.974
H ₀₄	Accepted	Personality → professional commitment	0.34	10.14	2.25	0.037	0.982	0.979	0.057	0.057	0.959	0.929	0.957
H ₀₅	Accepted	Personality → work commitment factors	0.14	4.03	2.09	0.034	0.984	0.981	0.057	0.057	0.970	0.944	0.968
H ₀₆	Accepted	Professional commitment → job satisfaction	0.37	11.83	2.83	0.045	0.992	0.989	0.049	0.049	0.988	0.982	0.987
H ₀₇	Accepted	Professional commitment → organizational commitment	0.32	8.45	2.09	0.034	0.992	0.989	0.050	0.050	0.986	0.973	0.984
H ₀₈	Accepted	Work commitment factors → organizational commitment	0.38	10.41	2.21	0.036	0.992	0.989	0.044	0.044	0.987	0.976	0.985
H ₀₉	Accepted	Work commitment factors → job satisfaction	0.40	12.89	2.69	0.043	0.992	0.990	0.052	0.052	0.990	0.984	0.989

Table 11. The results of hypothesis about mediating effects of variables.

Hypot. no.	Description	Models	χ^2/df	RMSEA	GFI	AGFI	RMR	SRMR	CFI	NFI	NNFI
H ₁₀	Accepted		2.17	0.036	0.975	0.973	0.069	0.069	0.961	0.930	0.960
H ₁₁	Accepted		2.34	0.038	0.986	0.983	0.069	0.069	0.980	0.965	0.978
H ₁₂	Accepted		2.32	0.038	0.986	0.984	0.074	0.074	0.982	0.968	0.980
H ₁₃	Accepted (partial mediation)		2.00	0.033	0.981	0.978	0.059	0.059	0.972	0.946	0.971
H ₁₄	Accepted (partial mediation)		1.91	0.031	0.982	0.980	0.059	0.059	0.977	0.953	0.976

(continued)

Table 11. Continued.

Hypot. no.	Description	Models	χ^2/df	RMSEA	GFI	AGFI	RMR	SRMR	CFI	NFI	NNFI
H ₁₅	Accepted (partial mediation)	<pre> graph LR P(Personality) -- 0,16 --> WCF(Work commitment factors) WCF -- 0,35 --> OC(Organizational commitment) P -- 0,18 --> OC </pre>	2.25	0.037	0.976	0.973	0.057	0.057	0.956	0.923	0.954

occupation, job satisfaction and organizational commitment of construction professionals concurrently.

Job satisfaction has a variant structure that is more likely to be affected by experiences and daily events rather than the organizational commitment of the employees. Thus, organizational commitment has a more decisive influence on the intention of the employee to leave more than job satisfaction (Fabi et al. 2015). In this study, variables affecting the organizational commitment, their direct and indirect relationships with each other are examined together with the mediation effect of job satisfaction on these relationships.

Literature shows various relationships between the five factor personality traits and the sub-dimensions of organizational commitment (Naquin and Holton 2002; Erdheim et al. 2006; Panaccio and Vandenberghe 2012; Choi et al. 2015). In addition to previous research findings, a direct relationship was found between personality and organizational commitment (H₀₂). According to the obtained results from mediation analyses, it was seen that the effect of personality on organizational commitment was realized through job satisfaction (H₁₀) and the factors that affect work commitment (H₁₅). The material and moral satisfaction, which the employees feel about their work, increased with the factors like organizational justice, presence of motivating tools and prizes and so on and may also affect their commitment to the organization depending on their personality (Choi et al. 2015). For example, it is easier for extrovert and positive individuals to be satisfied with their work and the environment of the workplace. Moreover, tendency of these individuals to be in unsatisfied moods is also less likely when compared to introvert and negative individuals. While it has been observed that personality traits of employees are important determinants of their work-related feelings, it has also been observed that the direct effect of personality on organizational commitment and job satisfaction is not very high.

Another important result obtained from the study is that the relationship between job satisfaction and organizational commitment is high (H₀₁) (Yoon and Thye 2002; Yang and Chang 2008; Ho Hung 2007; Akar and Yıldırım 2008; Matzler and Renzl 2010; Fu and Deshpande 2014; Fabi et al. 2015; Mathieu et al. 2016) and inclusion of other variables (personality, professional commitment and work commitment factors) in the model effect of job satisfaction on organizational commitment (H₂₁) increases. According to the mediation analyses, this effect is mainly personality-related (H₁₀). In the literature, it is argued that the extraversion personality trait has a positive effect on organizational commitment (Panaccio and Vandenberghe 2012). It is thought that extroverts have more tendency to positive mood and a happy mood increases the affective commitment to the organization. At this point, it was stated that when the factors affecting the positive mood are investigated in more detail as recommended by Panaccio and Vandenberghe (2012). Reward factors, fair promotion policies, presence of motivating tools and fair division of labor are determined as the main factors affecting job loyalty.

In the literature, professional commitment is defined as identification of the employees with their professions and highlighting their professional identities. Research findings show that personality also has a direct impact on the professional commitment of Turkish construction professionals (H₁₆). Furthermore, it was observed that job satisfaction is influenced by factors affecting personality, professional commitment and work commitment (H₁₇, H₁₉ and H₂₀). Literature presents (Furnham et al. 2002; Judge et al. 2002; Uyan 2002; Sevimli and İşcan 2005; Mount et al. 2006; Aydoğmuş 2011) a positive relationship between job satisfaction and conscientiousness, agreeableness and extraversion. However, a negative relationship was found between job satisfaction and neurotism dimension during the current study. It is concluded that an employee's personality is effective in his emotional state associated with work

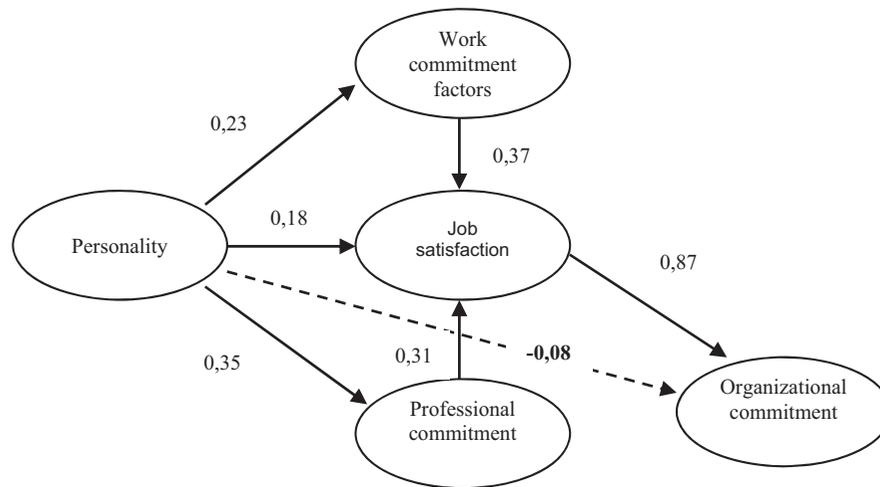


Figure 2. The results of the research model.

Table 12. The results of the research model.

Hypothesis no.	Description	Structural relations	Path coefficients	t-values	χ^2/df	RMSEA	GFI	AGFI	RMR	SRMR	CFI	NFI	NNFI
H ₁₆	Accepted	Personality → professional commitment	0.35	11.53	2.80	0.000	0.97	0.97	0.072	0.072	0.94	0.91	0.94
H ₁₇	Accepted	Personality → job satisfaction	0.18	5.59									
H ₁₈	Accepted	Personality → work commitment factors	0.23	7.40									
H ₁₉	Accepted	Professional commitment → job satisfaction	0.31	10.63									
H ₂₀	Accepted	Work commitment factors → job satisfaction	0.37	13.73									
H ₂₁	Accepted	Job satisfaction → organizational commitment	0.87	37.33									
H ₂₂	Rejected	Personality → organizational commitment	-0.08	-2.59									

and the person who has positive personality can be satisfied with his/her job, easily. Professional commitment additionally plays an important role in ensuring job satisfaction. The high level of professional commitment refers to the completion of the first step in each employee's dream of doing the work he/she loves. The likelihood of an employee with a high level of professional commitment to be satisfied with his/her job is higher (H₁₉) (Baugh and Roberts 1994).

Personality and professional commitment directly affect the satisfaction of the employees and their job satisfaction which can be variable and can be served to express their feelings; therefore, when these emotions become continuous, they become behavior or attitudes and they create or/and influence on commitment to the organization. It was observed that personality was indirectly affected from affective commitment, normative commitment and continuance commitment, respectively. There is no branching on the civil engineering education in Turkey and received diplomas after graduation is called as 'the diploma of civil engineering'. However, employees

prefer to work in areas of professional interest such as road projects, water structures, planning, etc. There is an effort of employees to concentrate on a specific area for providing work and experience. As in the health sciences, there is no academic branching in the construction sector but there is an individual orientation. This individual orientation makes the work itself important. At this point, the professional commitment for the construction sector employees has become important in the perception of the work (H₁₉). The construction sector has a project-based structure and the teams are specific to the project. Even in long-term projects, there may be changes in teams or technical staff in the life cycle of the project as well. At this point, rather than the idea of working in the same workplace during their professional life, employees develop a perception that focuses on what they work. Therefore, the job satisfaction in organizational commitment of the employees on the construction sector has more importance than the other sector employees (H₂₁) (Fu and Deshpande 2014; Fabi et al. 2015; Mathieu et al. 2016).

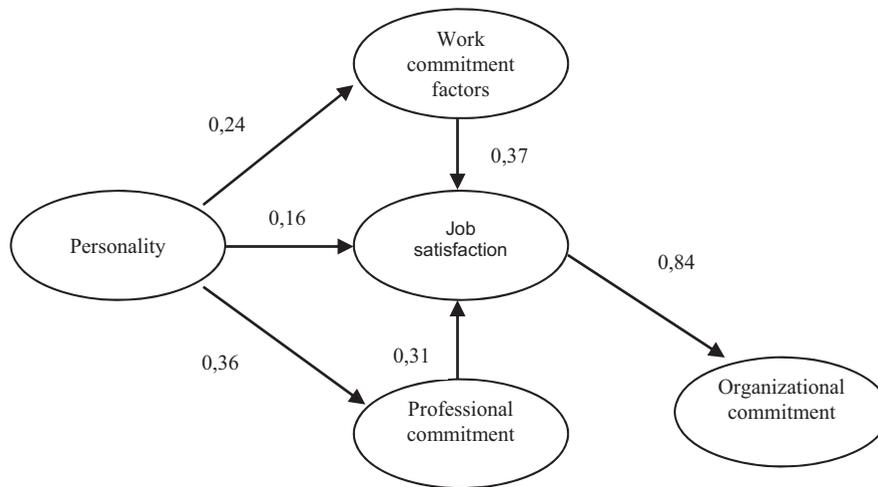


Figure 3. The results of the final research model.

Table 13. The results of the final research model.

Hypothesis no.	Description	Structural relations	Path coefficients	t-values	χ^2/df	RMSEA	GFI	AGFI	RMR	SRMR	CFI	NFI	NNFI
H ₁₆	Accepted	Personality → professional commitment	0.36	11.77	2.11	0.035	0.972	0.969	0.072	0.072	0.961	0.928	0.959
H ₁₇	Accepted	Personality → job satisfaction	0.16	5.09									
H ₁₈	Accepted	Personality → work commitment factors	0.24	7.64									
H ₁₉	Accepted	Professional commitment → job satisfaction	0.31	10.46									
H ₂₀	Accepted	Work commitment factors → job satisfaction	0.37	13.59									
H ₂₁	Accepted	Job satisfaction → organizational commitment	0.84	43.86									

Moreover, job satisfaction has major effect on organizational commitment of employees in Turkish construction industry. Personality, professional commitment and work commitment factors, which were found out to be affecting organizational commitment by previous studies was determined to be affecting organizational commitment of Turkish professionals through job satisfaction.

According to these results, it is seen that it is necessary to focus on job satisfaction in order to increase the organizational commitment of construction professionals or to ensure the continuity of organizational commitment. Considering the three variables affecting job satisfaction, it is recommended that the employer provides positions appropriate to the personality of the employee without changing the personality of the employees and prefer oral motivation tools with appreciation, especially for individuals with high neurotic susceptibility. Moral motivation tools will have a positive effect on the mood of the employee without damaging the sense of justice within the organization according to the material motivation tools such as prizes with financial value. The professional commitment is a variable that is not directly under control of the employer, such as personality, but can also be supported by providing appropriate tasks to the employee's experience and

enabling the employee to improve themselves in the professional sense such as support for vocational training, certificate programs and participation in professional fairs. In addition, the company's support of employees for professional development will make the employee feel emotionally valuable. This situation will positively affect the affective and normative commitment of the employee to the organization.

Among the factors affecting work commitment, prizes, fair promotion policies, motivating tools and fair division of labor were determined to be prominent for construction sector employees. This situation shows that Turkish companies should give importance to organizational justice. Ensuring the continuity of organizational justice in the company will enable the employees to feel trust in the company and allow them to feel peace. The knowledge that the employee will receive a reward (such as prizes, promotion opportunities, etc.) when they perform well will affect the job satisfaction and organizational commitment positively. Employees expect motivation tools to be used and prizes and promotions are among the first choices of them. In addition, a fair division of labor is also one of the issues that employees give importance to. Work-life balance of each employee should be considered and excessive overtime work should be avoided. In addition, the excessive workload on a

single employee in order not to employ more than one employee can be considered as excessive work load is one of the most important factors that negatively affect the psychology of the employees.

7. Conclusion

This study, which was conducted in order to investigate the factors affecting the organizational commitment of the employees in the construction sector, was applied to the architects and civil engineers working actively in the Turkish construction sector. As a result of the analyses carried out within the scope of the study, it is revealed that all of the variables of personality, professional commitment and job satisfaction have direct or indirect effects on organizational commitment. There are also latent relationships between factors affecting organizational commitment. Path analysis findings of the study are in parallel to the literature findings. It is found that job satisfaction affects organizational commitment at a high level; personality affects professional commitment, job satisfaction and organizational commitment at a moderate level and work commitment factors at a low level. Professional commitment affect job satisfaction and organizational commitment at moderate level. Work commitment factors affect job satisfaction and organizational commitment at a moderate level. When direct effects were examined, it was observed that the most important factor affecting organizational commitment was job satisfaction. Mediation analyzes were conducted to investigate the effects of direct relationships between variables. As a result of mediation analyzes, it is determined that personality, professional commitment and work commitment factors affect the organizational commitment through job satisfaction. In addition to these results, it is observed that professional commitment and work commitment factors have partial mediating effect between personality and job satisfaction. Also, work commitment factors has partial mediating effect between personality and organizational commitment. The research model, which was shaped according to mediation analysis, was tested with structural equation modeling method. In the research model, the path between personality and organizational commitment was insignificant. According to the results, personality directly affects professional commitment, work commitment factors and job satisfaction. Personality, professional commitment and work commitment factors all affect organizational commitment through job satisfaction.

According to the results obtained in the research model, in the construction sector, it is observed that the personality is effective in employees' perceptions about the work but it does not have a very intensive effect. It is known that there is a positive mood of extroverted individuals and the positive mood of these individuals is sustainable for a longer period. At the recruitment stage knowing the personality characteristics of the employee will be useful in determining the position. In addition, knowing the personality characteristics of the employees by the firm will help the company to determine the achievable goals that will enable the employee to maintain a positive mood. Generally, companies prefer to keep their performance targets high but this may have a negative impact on a neurotic worker. Therefore, while setting the performance targets of the employees, the first target steps should be made available and the material or moral incentives should be applied in a fair manner in each captured target level. Thus, it will be easier for both extroverted and neurotic individuals to maintain their positive moods.

Current research results show that the most important factor affecting the organizational commitment of construction sector employees is job satisfaction. When work commitment factors are examined, rewards for employees, fair promotion policies, motivating tools and fair division of labor are important factors in increasing job satisfaction for construction sector employees. Job satisfaction may vary with employee experience at work. In this case, a periodical measurement of employee satisfaction levels would benefit construction companies by providing information on the continuity of employees' dissatisfaction or vice versa. It is recommended that the human resource departments of large companies should carry out psychological analysis and support to the employees, similar to the guidance services applied in schools. That is important at this point is the decrease in the job satisfaction of the employee. The causes of dissatisfaction can then be determined in order to take corrective action.

The study can be expanded by including larger samples or other stakeholders in the construction sector. The personality, job satisfaction and organizational commitment scales which are the basis of the study intend to measure personal feelings of the respondents. In future studies, two-way research can be conducted by conducting these scales both to the employees themselves and to their employers, colleagues or supervisors. Thus, the work can be elaborated by comparing the personal interpretations with

the comments of an external observer. Different variables (such as intention to leave, performance, organizational justice) can also be included in the models.

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Appendix

Personality questions

1	Is talkative	23	Tends to be lazy
2	Tends to find fault with others	24	Is emotionally stable, not easily upset
3	Does a thorough job	25	Is inventive
4	Is depressed, blue	26	Has an assertive personality
5	Is original, comes up with new ideas	27	Can be cold and aloof
6	Is reserved	28	Perseveres until the task is finished
7	Is helpful and unselfish with others	29	Can be moody
8	Can be somewhat careless	30	Values artistic, aesthetic experiences
9	Is relaxed, handles stress well	31	Is sometimes shy, inhibited
10	Is curious about many different things	32	Is considerate and kind to almost everyone
11	Is full of energy	33	Does things efficiently
12	Starts quarrels with others	34	Remains calm in tense situations
13	Is a reliable worker	35	Prefers work that is routine
14	Can be tense	36	Is outgoing, sociable
15	Is ingenious, a deep thinker	37	Is sometimes rude to others
16	Generates a lot of enthusiasm	38	Makes plans and follows through with them
17	Has a forgiving nature	39	Gets nervous easily
18	Tends to be disorganized	40	Likes to reflect, play with ideas
19	Worries a lot	41	Has few artistic interests
20	Has an active imagination	42	Likes to cooperate with others
21	Tends to be quiet	43	Is easily distracted
22	Is generally trusting	44	Is sophisticated in art, music, or literature

Job satisfaction questions

1	Being able to keep busy all the time	11	The chance to do something that makes use of my abilities
2	The chance to work alone on the job	12	The way company policies are put into practice
3	The chance to do different things from time to time	13	My pay and the amount of work I do
4	The chance to be 'somebody' in the community.	14	The chances for advancement on this job
5	The way my boss handles his/her workers	15	The freedom to use my own judgement
6	The competence of my supervisor in making decisions	16	The chance to try my own methods of doing the job
7	Being able to do things that don't go against my conscience	17	The working conditions
8	The way my job provides for steady employment	18	The way my co-workers get along with each other
9	The chance to do things for other people	19	The praise I get for doing a good job
10	The chance to tell people what to do	20	The feeling of accomplishment I get from the job

Organizational commitment questions

1	I would be very happy to spend the rest of my career with this organization.	13	Right now, staying my organization is a matter of necessity as much as desire.
2	I enjoy discussing my organization with people outside it.	14	I feel I have too few options to consider leaving this organization.
3	I really feel as if this organization's problems are my own.	15	One of the few serious consequences of leaving this organization would be the scarcity of available alternatives.
4	I think that I could easily become as attached to another organization as I am to this one	16	One of the major reasons I continue to work for this organization is that leaving would require considerable sacrifice. Another organization may not match the overall benefits I have here.
5	I do not feel like 'part of the family' in my organization.	17	I think that people these days move from company to company too often.
6	I do not feel 'emotionally attached' to this organization	18	I do not believe that a person must always be loyal to his or her organization
7	This organization has a great deal of personal meaning for me.	19	

(continued)

Continued.

Personality questions			
8	I do not feel a strong sense of belonging to my organization	20	Jumping from organization to organization does not seem at all unethical to me One of the major reasons I continue to work for this organization is that I believe that loyalty is important and therefore feel a sense of moral obligation to remain.
9	I am not afraid of what might happen if I quit my job without having another one lined up	21	If I got another offer for a better job elsewhere, I would not feel it was right to leave my organization.
10	It would be very hard for me to leave my organization right now, even if I wanted to.	22	I was taught to believe in the value of remaining loyal to one organization.
11	Too much in my life would be disrupted if I decided I wanted to leave my organization now.	23	Things were better in the days when people stayed with one organization for most of their career
12	It would not be too costly for me to leave my organization now	24	I do not think that wanting to be a 'company woman' is sensible anymore
Professional commitment questions			
1	If could, would go into a different occupation.	3	I don't do this job if I don't need money.
2	Can see self in occupation for many years.	4	Have ideal occupation for life work.
Work commitment factors			
1	Unemployment	7	Alternative job opportunities
2	Social health insurance	8	Having motivating tools
3	Awards	9	Doing an importing job
4	Promotion policies with in justice	10	Education and self-improvement opportunity
5	Job security	11	Employee-organization goal compatibility
6	Working hours	12	Job sharing with in justice