

Civil engineers' personal values/ demographics linkage in project team building

Civil engineers'
personal
values

1337

Atila Damci

Department of Civil Engineering, Istanbul Technical University, Istanbul, Turkey

David Arditì

*Department of Civil, Architectural, Environmental Engineering,
Illinois Institute of Technology, Chicago, Illinois, USA, and*

Gul Polat

Department of Civil Engineering, Istanbul Technical University, Istanbul, Turkey

Received 12 August 2016
Revised 28 December 2016
Accepted 23 February 2017

Abstract

Purpose – The purpose of this paper is to explore the relationship between civil engineers' demographics (e.g. age, marital status, education, work experience) and their personal values. The objective was to predict civil engineers' personal values based on their demographics.

Design/methodology/approach – A questionnaire survey was administered to civil engineers to collect data on their demographics and their personal values. Statistical analysis was performed to verify whether a significant statistical relationship exists between civil engineers' demographics and their personal values.

Findings – The most important and the least important personal values were identified for civil engineers. Statistical analysis indicated that civil engineers' values do vary based on their demographics.

Research limitations/implications – The results of this study cannot be generalized, because individuals' personal values and demographics are, by definition, local. Location and culture may affect the personal values of civil engineers.

Practical implications – Team leaders normally have access to information about the demographics of the engineers they employ; based on the results of this study, they should be able to predict their personal values, and to make more informed decisions when appointing them to particular positions on project teams.

Originality/value – The research presented in this paper, establishes for the first time, that a linkage exists between civil engineers' personal values and their demographics, and makes it easier for team leaders to make assignment decisions.

Keywords Organization, Project management, Questionnaire survey

Paper type Research paper

Introduction

Professional life for civil engineers involves not only technical decisions, but also managerial decisions. Civil engineers commonly make managerial decisions according to their "personal values" (McCuen, 1998; Kilby, 1993; Rokeach, 1973). Value is defined by Rokeach (1973) as "an enduring belief that a specific mode of conduct or end-state of existence is personally or socially preferable to an opposite or converse mode of conduct or end-state of existence." Values have a profound influence on how individuals perceive things, and consequently how individuals make decisions. Furthermore, Suar and Khuntia (2010) claim that personal values have an impact on individuals' professional choices. Elizur and Sagie (1999) state that values that an individual emphasize in an organization are a subset of the values that he/she emphasizes in his/her personal life.

The question of whether there is a linkage between personal values and demographics should be of interest to project team leaders who deal with assigning team members



to positions in the team. If there is a linkage between personal values and demographics, then one could assume that this will be a helpful tool in project team building. However, there has been no attempt in the literature to explore the linkage between personal values of civil engineers and their demographics. This study attempts to fill the gap. The objectives of the study are: to collect and analyze data to understand which personal values are considered to be important by civil engineers; and to explore the existence of a linkage between the personal values of civil engineers and their demographics.

Theoretical background and literature review

The values that a civil engineer considers important should reflect the values that are important for his/her role in the project team. For instance, if an individual attaches much importance to courage and broadmindedness while the nature of the project requires values such as logic and capability, the decisions made by this individual are likely to result in failure. Project team leaders should be aware that their subordinates attach different levels of importance to different values, and that the decisions they make may be affected accordingly (McCuen, 1998). For example:

- Personal values that focus on understanding, appreciation and protection of the welfare of all people (e.g. logical, broadminded) and the preservation and enhancement of the welfare of people in everyday interaction (e.g. helpful, responsible, forgiving, honest) were listed among the most important values in various studies (e.g. Biber *et al.*, 2008; Lan *et al.*, 2013; Sverdlik, 2012). In addition, Biber *et al.* (2008) state that individuals giving high priority to these values put less importance on values such as “ambitious” and “capable.” The findings of the studies conducted by Steenhaut and Kenhove (2006) and Lan *et al.* (2013) reveal that placing emphasis on these personal values could entail greater job satisfaction, greater social responsibility, and greater concern for ethical behavior in individuals’ professional lives. Schmidt and Posner (1982) and Posner and Schmidt (1992) state that personal values such as broadmindedness, responsibility, and honesty are among the most important personal values for managers. Therefore, these personal values might be of importance to civil engineers who occupy management positions with oversight on a number of subordinates.
- According to Dubinsky *et al.* (1997), self-direction promotes performance. Rice (2006) claims that self-direction also supports creativity. Self-direction refers to personal values such as “intellectual,” “independent,” and “imaginative” among those listed by Rokeach (1973). Actually, these personal values were found to be among the most important values in a number of studies (e.g. Lan *et al.*, 2008; Sverdlik, 2012). On the other hand, Steenhaut and Kenhove (2006) state that the more an individual places emphasis on these personal values, the more likely an individual is to behave unethically. Richards (1998) claims that creativity is an essential component in engineering design. Furthermore, Stouffer *et al.* (2004, p. 9.883.10) suggest that “the next generation engineers will require a creative outlook to approach technical problems in new ways.” In a task committee paper published by the Structural Engineering Institute of the American Society of Civil Engineers (2013), it is claimed that self-direction – which supports creativity according to Rice (2006) – is one of the soft skills that should be possessed by future structural engineers. Therefore, personal values related to self-direction such as “intellectual,” “independent,” and “imaginative” might be important for a civil engineer who deals with design problems that require not only high performance but also creativity in engineering design.

- The findings of the study conducted by Rice (2006) suggest that personal values that intend to restrain actions, inclinations, and impulses that are likely to upset or harm others and violate social expectations (e.g. “responsible,” “self-controlled,” “politeness,” “obedience,” and “neat and tidy”) may have a negative impact on an individual’s creativity. Furthermore, Biber *et al.* (2008) and Sverdlik (2012) claim that the more individuals emphasize personal values such as “politeness” and “obedience,” the less they are interested in being “independent,” “imaginative,” “courageous,” “ambitious,” and “capable.” However, Steenhaut and Kenhove (2006) state that the more importance an individual attaches to these personal values, the more likely this individual is to be idealistic and evaluate ethically questionable practices as inappropriate. On the other hand, they also state that an individual who gives high priority to personal values focusing on pleasure and enjoying life (e.g. loving, cheerful) may hold an unethical disposition. Holding an ethical or unethical disposition is crucial for civil engineers who deal with technical decisions as well as ethical issues in their professional life. Ethical issues are of special importance in the construction industry. In a recent survey of professionals in the construction industry, 84 percent of the respondents indicated that they had personally witnessed unethical behavior in the previous year (Survey of Construction Industry Ethical Practices, 2004).
- Adkins and Naumann (2002), Dubinsky *et al.* (1997), and Parks and Guay (2012) state that personal values that are important for personal success through demonstrating competence according to social standards (e.g. “ambitious,” and “capable”) are related to the performance of individuals rather than the performance of the organization. Sousa *et al.* (2012) state that individuals who attach more importance to these personal values are more confident in their capabilities to execute their job well. Lan *et al.* (2008) and Sverdlik (2012) found that these personal values were perceived by most employers to be important. In sum, these studies suggest that individuals who place emphasis on these personal values are likely to perform better.

Identifying the values that are important for every member of the project team might be difficult due to the large number of employees and the difficulty in collecting this kind of information. How can a project team leader predict the personal values of civil engineers so that an individual civil engineer’s values fit the values desired in the position earmarked for this civil engineer? It is hypothesized that individuals with different demographics (e.g. age, marital status, education, work experience) might have different personal values. Since employees’ demographics are readily available to project team leaders, it should be possible to predict an individual’s personal values. The knowledge of such a relationship would allow the team leader to make more informed assignment decisions.

Even though several studies have been conducted to explore the personal values of individuals (e.g. Karacaer *et al.*, 2009; Lan *et al.*, 2008, 2013; Lee and Trail, 2011), studies that explore the personal values of engineers are limited (e.g. Johnson and Singh, 1998; McCuen, 1998; McCuen and Pritchard, 1983). The relationship between civil engineers’ personal values and their demographics has never been investigated. This study was undertaken in response to the absence of such research. In this study, the personal values and demographics of civil engineers are studied, and the relationship between personal values and demographics is investigated. The objective of the study is to predict the personal values of civil engineers based on their demographics.

Schwartz (2009) states that individual value priorities arise out of adaptation of life experiences. He also claims that since demographics present different sets of life experiences, they contribute to explaining individual differences in value priorities.

Therefore, it is most likely that civil engineers' personal values and their demographics vary greatly from one culture to another, from one industry to another, and from country to country. The relationship between the personal values and their demographics cannot be investigated in a global perspective. By necessity, such a study has to be conducted in the context of a location that is preferably non-trivial. The case of Turkey is investigated in this study by surveying civil engineers working in Turkish construction projects.

Research methodology

In this study, the main hypothesis is that civil engineers' demographics have an impact on their personal values. First, an extensive literature review was conducted to identify personal values and demographics. Subsequently, based on the information obtained in the literature review a questionnaire was designed and a survey was conducted to seek information about civil engineers' demographics and their personal values. Finally, statistical analysis was performed on the collected data to verify whether a significant statistical relationship exists between civil engineers' demographics and their personal values.

Different tests can be used to identify individuals' personalities and personal values. For example, the Belbin Self-Perception Inventory is a behavioral test for identifying an individual's team roles. The test measures nine team roles including plant, resource investigator, co-ordinator, shaper, monitor evaluator, teamworker, implementer, completer-finisher, and specialist (Belbin, 2010; Senior and Swailes, 1998). It is a well-known and popular test due to its ease of use, but has been criticized on its statistical validity and reliability by Furnham *et al.* (1993). Another test is the Myers-Briggs Type Indicator that is widely used to identify individuals' personality characteristics out of 16 personality types. It uses Jung's (1971) personality typology through four scales, namely, extraversion-introversion, sensation-intuition, thinking-feeling, judgment-perception (McCrae and Costa, 1989; Carlyn, 1977; Quenk, 2009). Researchers also categorized personality traits through a framework named the Five Factor Model (a.k.a. Big Five Personality Traits). This is a model that encompasses all major dimensions of personality traits in terms of five broad factors, namely, openness to experience, conscientiousness, extraversion, agreeableness, and neuroticism (Barrick and Mount, 1991; McCrae and Allik, 2002).

Having reviewed the powerful tools developed over the years for identifying individuals' personalities and personal values, only the 18 "instrumental values" rather than the "terminal values" identified by Rokeach (1973) were chosen in this study because they are one of the most cited values in the literature (e.g. Karacaer *et al.*, 2009; Lan *et al.*, 2008; Lan *et al.*, 2013; Lee and Trail, 2011) and because they best suit the needs of this investigation. Instrumental values refer to modes of behavior, while terminal values refer to end-state of existence that does not reflect the personalities of civil engineers. Even though Rokeach's model is one of the dominant methods to measure personal values, it has also received some criticism from Schwartz (1992, 1994) and Braithwaite and Scott (1991) who claim that the development of the personal values in Rokeach's model was based on intuition and on a research sample composed solely of North American individuals.

The questionnaire consists of seven questions. The demographics of the respondents such as age, marital status, education, work experience (i.e. number of years in the industry, type of employer, and the maximum project value) were sought in the first section of the questionnaire. These demographics are commonly used in research (e.g. Amankwah *et al.*, 2013; Gaki *et al.*, 2013; Huddleston *et al.*, 2002; Kukanja, 2013; Linz, 2004, Urošević and Milić, 2012; Wong *et al.*, 1999) and is readily available to any employer. In the second section, respondents were asked to rate themselves relative to the eighteen personal values that were identified in the literature review. The respondents were asked to use a Likert-like scale of 1-5; where "1" represents "not at all" and "5" "very much." The members of the Istanbul Chamber of Turkish Civil Engineers were the target population in this study,

because it is the main professional body of engineers in Turkey. The questionnaire was delivered to the members via e-mail along with a cover letter. They were given four weeks to complete and return the questionnaire via e-mail.

The Statistical Package for Social Sciences (IBM SPSS 21) was used in performing the statistical tests. First, a Cronbach's α coefficient of reliability was calculated in order to determine the internal consistency of the questionnaire as it is commonly advised in the literature for questionnaires that use a Likert scale (Oyedele, 2013). Second, the Mann-Whitney U test was performed as suggested by Carifio and Perla (2008) and Jamieson (2004) to compare two sets of data organized on Likert data.

Discussion of findings

Responses were obtained from 394 civil engineers. The respondents were split into groups on the basis of their demographics. The groups were classified according to age (younger than 35, older than 35), marital status (single, married), education (bachelor's degree, higher degree), experience in the construction industry (less than ten years, more than ten years), type of firm (contractor, non-contractor organization), value of largest project that the respondent worked on (less than \$50 million, more than \$50 million). The term "non-contractor organization" should be interpreted to include public organizations and consulting firms. In order to split respondents as evenly as possible, the median was used as the threshold for age, experience, and project value (Table I). Thus, adequate sample sizes were obtained within each group to perform statistical analysis.

After the questions about demographics, the respondents were asked to rate themselves relative to 18 personal values, namely, "ambitious," "broadminded," "capable," "cheerful," "clean," "courageous," "forgiving," "helpful," "honest," "imaginative," "independent," "intellectual," "logical," "loving," "obedient," "polite," "responsible," and "self-controlled." First, the Cronbach's α coefficient was calculated in order to confirm whether the personal values and their associated Likert scale are actually measuring the values of civil engineers.

Personal characteristics	Percentage of respondents
<i>Age</i>	
< 35	60
> 35	40
<i>Marital status</i>	
Single	41
Married	59
<i>Education</i>	
Bachelor's degree	57
Master's or Doctorate degree	43
<i>Experience in construction industry</i>	
< 10 years	57
> 10 years	43
<i>Type of firm</i>	
Non-contractor organizations	47
Contractor	53
<i>The value of largest project that the respondent worked on</i>	
< \$50 million	42
> \$50 million	58

Table I.
Personal characteristics of the respondents

It is commonly suggested that the scale is reliable if the Cronbach's α coefficient is greater than 0.8 (Cramer, 1994; George and Mallery, 2003). The overall Cronbach's α coefficient for this study was calculated to be 0.834 that indicates good reliability and internal consistency.

Personal values of civil engineers

As seen in Table II, the "instrumental values" identified by Rokeach (1973) were used in this study. "Honest" and "responsible" are the most important personal values for the respondents. These personal values were also ranked among the most important personal values in many studies conducted in different countries and different industries (e.g. Karacaer *et al.*, 2009; Kotey and Meredith, 1997; Lan *et al.*, 2008, 2013; Lee and Trail, 2011; Schmidt and Posner, 1982; Posner and Schmidt, 1992; Rassin, 2008; Stackman *et al.*, 2006). Fritzsche (1995) states that "honest" and "responsible" are likely to significantly influence decision-making behavior as these values are required to earn trust, honor, and loyalty.

The least important personal values for the respondents are "ambitious" and "intellectual." Only one or both of these personal values were also listed among the least important personal values in studies conducted by Karacaer *et al.* (2009) and Rassin (2008). It should be noted that Karacaer *et al.* (2009) and Rassin (2008) conducted their studies in the accounting and nursing professions, respectively. Even though these studies are conducted on different professional populations in different industries, they support the findings of this study on the least important personal values.

In order to see that all criteria are contributing to internal consistency, "Cronbach's α if item deleted" values were also calculated. If there is a "Cronbach's α if item deleted" value that is higher than the overall Cronbach's α coefficient, then the related criterion can be deleted in order to increase the overall Cronbach's α coefficient value (Field, 2005). As seen in Table II, there is no need to exclude any of the personal values, because all "Cronbach's α if item deleted" values are lower than the overall Cronbach's α coefficient of 0.834.

It should be noted that the most important and the least important personal values might be different in other studies, because personal values are not a one-size-fits-all concept. This argument is supported by Schwartz's (2009) study, in which he states that individual value priorities depend on different life experiences. Therefore, not only do individuals rank

Personal values	Cronbach's α	Overall arithmetic mean score
Honest	0.832	4.76
Responsible	0.829	4.63
Logical	0.830	4.46
Obedient	0.826	4.34
Broadminded	0.827	4.31
Forgiving	0.825	4.28
Self-controlled	0.829	4.24
Helpful	0.822	4.22
Capable	0.823	4.17
Cheerful	0.821	4.02
Neat and tidy	0.827	4.01
Polite	0.819	3.84
Independent	0.825	3.81
Courageous	0.824	3.79
Loving	0.818	3.69
Imaginative	0.827	3.66
Ambitious	0.829	3.46
Intellectual	0.829	3.43

Table II.
Arithmetic mean scores and "Cronbach's α if item deleted" values for personal values

personal values in a different order of importance in different industries and countries, but also one cannot classify personal values as good or bad either. For example, being responsible is considered as an important personal value in professional life. If a professional is aware that some team members falsified project documents, being responsible to society may push the professional toward acting publicly on the information. Conversely, a professional who considers loyalty as one of his/her responsibilities to the project team may decide not to act publicly on the information in order to optimize career expectations (McCuen, 1998).

Impact of demographics on personal values of civil engineers

The Mann-Whitney U test was performed to explore the similarity or difference in civil engineers' personal values based on their demographics. The null hypothesis is that there are no differences in the mean scores of the personal values as perceived by civil engineers in two groups (e.g. bachelor's degree vs higher degree, less than ten years of experience vs more than ten years of experience, etc.). If the null hypothesis is rejected, it means that the difference between the mean scores of the personal values are statistically significant at $\alpha = 0.05$, indicated by an asterisk (*) in Table III. The overall arithmetic mean scores of the personal values are listed in Table III.

The results in Table III reveal that there is a statistically significant difference in some personal values when viewed by civil engineers who are younger than 35 vs older than 35. The civil engineers who are younger than 35 attach more importance to "ambitious." This result can be explained by the fact that young civil engineers are at the beginning of their career and therefore more ambitious than older civil engineers in gaining experience and looking for opportunities for promotion. This finding is consistent with the results of the study conducted by Rassin (2008), even though Rassin's (2008) respondents were employed in the health care industry in Israel. Rassin (2008) states that younger nurses rated the personal value of "ambitious" higher than older nurses. On the other hand, it should be noted that civil engineers older than 35 attach more importance to "responsible," "self-controlled," "neat and tidy," "independent" and "loving." Older individuals are more likely to be more mature than younger individuals and may have more extensive family responsibilities; therefore it makes sense that "responsible," "self-controlled," "neat and tidy," "independent" and "loving" are important for individuals who are older than 35. It must however be stated that Rassin (2008) could not find a statistically significant difference in perception of these personal values by young and old nurses.

It was observed that single and married civil engineers were in general agreement in their perception of personal values except for "broadminded" and "ambitious." Single civil engineers attach more importance to "broadminded" and "ambitious" than civil engineers who are married. It is likely that single engineers are younger than married engineers. Young individuals are commonly more open to accept views or beliefs that differ from theirs. Therefore, it is understandable that single civil engineers attach more importance to "broadminded." Married individuals are more likely to be older and to have a settled and routine life with less travel and a higher desire for stability. It is not surprising that married civil engineers attach less importance to "ambitious."

The results also show that civil engineers who have a bachelor's degree and civil engineers who have a higher degree perceive "self-controlled" and "independent" differently. These personal values are more important for respondents who have a bachelor's degree, than for those who have a higher degree. Rassin (2008) also found that the educational background of employees does influence employees' perceptions of personal values. Even though Rassin's (2008) study was conducted in a different industry and country, it is worth noting that employees with different educational background may attach different levels of importance to different personal values.

Table III.
Arithmetic mean
scores for personal
values by personal
characteristics

Personal values	Age		Marital Status		Education		Arithmetic mean score				Type of company		Project Value	
	Younger than 35	Older than 35	Single	Married	Bachelor's degree	Master's/Doctorate degree	Experience under 10 years	Experience over 10 years	Contractor	Non-contractor organizations	Maximum project value under \$50 million	Maximum project value over \$50 million		
Honest	4.76	4.76	4.81	4.73	4.79	4.73	4.77	4.76	4.71*	4.83*	4.81	4.83		
Responsible	4.57*	4.69*	4.59	4.63	4.58	4.66	4.59	4.66	4.61	4.63	4.63	4.63		
Logical	4.51	4.40	4.51	4.44	4.49	4.43	4.50	4.41	4.48	4.44	4.45	4.44		
Obedient	4.30	4.40	4.31	4.36	4.36	4.32	4.31	4.38	4.32	4.36	4.36	4.36		
Broadminded	4.30	4.33	4.41*	4.25*	4.33	4.29	4.31	4.30	4.29	4.33	4.36	4.33		
Forgiving	4.31	4.23	4.29	4.27	4.27	4.29	4.31	4.21	4.21	4.34	4.26	4.34		
Self-controlled	4.14*	4.33*	4.24	4.20	4.27*	4.15*	4.15	4.27	4.22	4.19	4.26	4.19		
Helpful	4.21	4.22	4.25	4.19	4.20	4.22	4.22	4.19	4.16	4.26	4.23	4.26		
Capable	4.11	4.22	4.16	4.15	4.15	4.15	4.12	4.21	4.23*	4.07*	4.10	4.07		
Cheerful	4.07	3.94	4.04	4.00	4.07	3.95	4.07	3.95	4.00	4.04	3.97	4.04		
Neat and tidy	3.85*	4.22*	3.99	4.00	3.97	4.04	3.87*	4.16*	4.02	3.96	3.96	3.96		
Polite	3.75	3.95	3.82	3.84	3.88	3.77	3.77	3.89	3.81	3.84	3.82	3.84		
Independent	3.74*	3.90*	3.82	3.78	3.90*	3.67*	3.76	3.86	3.75	3.87	3.85	3.87		
Courageous	3.76	3.77	3.85	3.71	3.79	3.73	3.75	3.78	3.72	3.81	3.80	3.81		
Loving	3.60*	3.83*	3.60	3.76	3.72	3.65	3.64	3.77	3.68	3.71	3.70	3.71		
Imaginative	3.73	3.52	3.77	3.56	3.65	3.64	3.75*	3.50*	3.60	3.69	3.59	3.69		
Ambitious	3.53*	3.26*	3.61*	3.29*	3.37	3.50	3.51	3.27	3.39	3.44	3.44	3.44		
Intellectual	3.41	3.53	3.50	3.42	3.44	3.47	3.42	3.52	3.42	3.52	3.38	3.52		

Note: *Significant difference between pairs at $\alpha = 0.05$

When one considers the years of work experience of the respondents, the results show that there is a significant difference in the perception of "neat and tidy" and "imaginative." The members of project teams who have less than ten years of work experience in construction projects attached more importance to "imaginative." This result is understandable since engineers who are at the beginning of their professional career have not been extensively exposed to established processes, hence depending on imaginative solutions. On the other hand, engineers who have more than ten years of work experience attached more importance to "neat and tidy." This result is also understandable because engineers with extensive work experience are likely to be assigned to more responsible positions in the project team, hence requiring a high level of proficiency in the oversight of a number of subordinates. The findings of the study conducted by Rassin (2008) support this result as Rassin (2008) also found a statistically significant difference in the personal values of experienced and novice nurses, albeit for different personal values.

Civil engineers employed by contractor and non-contractor organizations agreed in their perception of all personal values except "honest" and "capable." Engineers employed by non-contractor organizations attached more importance to "honest," while engineers employed by contractors attached more importance to "capable."

Finally, as seen in Table III, the value of the projects on which civil engineers worked did not have a significant impact on their personal values. Respondents attached the same importance to all personal values regardless of the size of the projects they undertook in the past.

The results of this study can be understood more clearly by considering two respondents who represent different demographics. For that purpose, two respondents were selected randomly (Table IV). The Mann-Whitney U test was performed between these two civil engineers. When the differences in their ranking were tested, a statistically significant difference was observed in the perception of personal values by those civil engineers. The Mann-Whitney U statistic is significant at $\alpha = 0.05$, which proves that the importance attached by these two civil engineers to different personal values is different. This finding reveals that individuals who have different demographics might consider different values in their decisions whether it is related to professional or personal life.

As mentioned earlier, Rice (2006) suggests that personal values such as responsibility, self-control, and being neat and tidy may influence an individual's creativity negatively, while personal values such as intellectual pursuits and imagination have a positive influence

Personal Characteristics	Civil Engineer A	Civil Engineer B
Age	< 35	> 35
Marital status	Single	Married
Education	Master's or doctorate degree	Bachelor's degree
Experience in construction industry	< 10 years	> 10 years
Type of firm	Non-contractor organization	Contractor
The value of largest project that the respondent worked on	> \$50 million	< \$50 million
Personal values	Arithmetic mean score	
Honest	3.82	2.88
Responsible	4.50	4.55
Broadminded	4.36	4.25
Self-controlled	4.64	4.31
Capable	4.91	4.81
Neat and tidy	3.73	4.06
Independent	4.36	4.38
Loving	4.55	4.69
Imaginative	4.36	3.94
Ambitious	5.00	4.75

Table IV.
Arithmetic mean scores for personal values and personal characteristics of two random respondents

on creativity. In Table IV, it can be seen that “Civil Engineer A” attaches less importance to responsibility, self-control, and being neat and tidy and more importance to broadmindedness and imagination, hence influencing creativity positively. Since Richards (1998) and Stouffer *et al.* (2004) state that creativity is an important factor in solving engineering design problems, a design-related position might be more appropriate for “Civil Engineer A” compared to “Civil Engineer B.”

The results also reveal that “Civil Engineer A” attaches more importance to honesty and broadmindedness in comparison to “Civil Engineer B.” In the light of Schmidt and Posner’s (1982) and Posner and Schmidt’s (1992) findings that personal values such as honesty and broadmindedness are among the most important personal values for managers, it can be assumed that “Civil Engineer A” may perform better than “Civil Engineer B.”

There is evidence in the literature that the more an individual places emphasis on imagination and less importance on responsibility, self-control, and being neat and tidy, the more likely is this individual to behave unethically (Steenhaut and Kenhove, 2006). Given the differences between “Civil Engineer A” and “Civil Engineer B” in Table IV, it would not be appropriate to assign “Civil Engineer A” to a position that deals extensively with ethically sensitive decisions.

Conclusion

The quality of the decisions made by civil engineers plays a pivotal role in the success of their projects. Professionals commonly make decisions based on their personal values. Professionals’ personal values should be in balance with the values that are important for their role in the project team. This study suggests that construction project team leaders need to pay attention to the personal values of the civil engineers they employ. Considering only technical or managerial skills is not sufficient in assigning roles to civil engineers. However, assigning civil engineers to appropriate positions based on their personal values is difficult in practice because employees’ personal values are not readily available. This study explored the relationship between the personal values and the demographics of civil engineers in Turkey. Given that the demographics of employees are readily available in HR records, a proven statistical relationship between demographics and personal values would allow reasonable prediction of personal values. Project team leaders can then make assignment decisions with more confidence.

The findings of the study reveal that civil engineers may rank personal values in a different order of importance according to their demographics such as age, marital status, education, work experience, and type of employer. This study provides construction project team leaders with a new perspective in making assignment decisions. The study provides a clear understanding of the relationship between civil engineers’ personal values and their demographics. Armed with such an understanding and knowing a civil engineer’s personal values, it may be easier for team leaders to assume that the civil engineer would fit well into a certain role on the project team. Whether such decisions are discriminatory is a matter of contention. One can argue that if an assignment decision is made based on personal values that vary with say age (or marital status), one can claim that this practice is discriminating against older (or married) professionals. However, consciously or unconsciously, team leaders routinely make this sort of decision based on their perception of their employees’ core personal values, except that they have to guess what these values are for each individual. The research presented in this paper, establishes for the first time, that a linkage exists between civil engineers’ personal values and their demographics, and makes it easier for team leaders to make assignment decisions.

The limitation of this study is that the results cannot be generalized, because individuals’ personal values and demographics are, by definition, local. Location and culture may affect the personal values of civil engineers. In future studies, a model can be developed to assign

civil engineers to appropriate positions in a project team by considering not only their technical skills, but also their personal values and demographics. Future research could also consider including additional demographics such as gender and position at the company.

References

- Adkins, C.L. and Naumann, S.E. (2002), "The value of achievement and responses to the work environment", *Journal of Behavioral and Applied Management*, Vol. 3 No. 2, pp. 140-154.
- Amankwah, J., Deh, I.Y. and Agyemang, I.K. (2013), "Demographic differences in the perceived best ways of motivating employees", *International Journal of Innovative Research and Development*, Vol. 2 No. 8, pp. 414-421.
- Barrick, M.R. and Mount, M.K. (1991), "The big five personality dimensions and job performance: a meta-analysis", *Personnel Psychology*, Vol. 44 No. 1, pp. 1-26.
- Belbin, M. (2010), *Management Teams: Why They Succeed or Fail*, 3rd ed., Elsevier Ltd, Oxford.
- Biber, P., Hupfeld, J. and Meier, L.L. (2008), "Personal values and relational models", *European Journal of Personality*, Vol. 22 No. 7, pp. 609-628.
- Braithwaite, V.A. and Scott, W.A. (1991), "Values", in Robinson, J.P., Shaver, P.R. and Wrightsman, L.S. (Eds), *Measures of Personality and Social Psychological Attitudes*, Academic Press, San Diego, CA, pp. 661-753.
- Carifio, J. and Perla, R. (2008), "Resolving the 50-year debate around using and misusing Likert scales", *Medical Education*, Vol. 42 No. 12, pp. 1150-1152.
- Carlyn, M. (1977), "An Assessment of the Myers-Briggs type indicator", *Journal of Personality Assessment*, Vol. 41 No. 5, pp. 461-473.
- Cramer, D. (1994), *Introducing Statistics for Social Research: Step-by-Step Calculations and Computer Techniques using SPSS*, Routledge, London.
- Dubinsky, A.J., Kotabe, M., Lim, C.U. and Wagner, W. (1997), "The impact of values on salespeople's job responses: a cross-national investigation", *Journal of Business Research*, Vol. 39 No. 3, pp. 195-208.
- Elizur, D. and Sagie, A. (1999), "Facets of personal values: a structural analysis of life and work values", *Applied Psychology: An International Review*, Vol. 48 No. 1, pp. 73-87.
- Field, A. (2005), *Discovering Statistics Using SPSS*, 3rd ed., Sage Publications, London.
- Fritzsche, D.J. (1995), "Personal values: potential keys to ethical decision making", *Journal of Business Ethics*, Vol. 14 No. 11, pp. 909-922.
- Fumham, A., Steele, H. and Pendleton, D. (1993), "A psychometric assessment of the Belbin team-role self-perception inventory", *Journal of Occupational and Organizational Psychology*, Vol. 66, pp. 245-257.
- Gaki, E., Kontodimopoulos, N. and Niakas, D. (2013), "Investigating demographic, work-related and job satisfaction variables as predictors of motivation in Greek nurses", *Journal of Nursing Management*, Vol. 21 No. 3, pp. 483-490.
- George, D. and Mallery, P. (2003), *SPSS for Windows Step by Step: a Simple Guide and Reference, 11.0 Update*, 4th ed., Allyn and Bacon, Boston, MA.
- Huddleston, P., Good, L. and Frazier, B. (2002), "The influence of firm characteristics and demographic variables on Russian retail workers' work motivation and job attitudes", *The International Review of Retail, Distribution and Consumer Research*, Vol. 12 No. 4, pp. 395-421.
- Jamieson, S. (2004), "Likert scales: how to (ab)use them", *Medical Education*, Vol. 38 No. 12, pp. 1212-1218.
- Johnson, H.M. and Singh, A. (1998), "The personality of civil engineers", *Journal of Management in Engineering*, Vol. 14 No. 4, pp. 45-56.
- Jung, C.G. (1923/1971), *Psychological Types* (translated and revised by H.G. Baynes R.F.C. Hull), Princeton University Press, Princeton, NJ.

- Karacaer, S., Gohar, R., Aygun, M. and Sayin, C. (2009), "Effects of personal values on auditor's ethical decisions: a comparison of Pakistani and Turkish professional auditors", *Journal of Business Ethics*, Vol. 88 No. 1, pp. 53-64.
- Kilby, R.W. (1993), *The Study of Human Values*, University Press of America, Lanham, MD.
- Kotey, B. and Meredith, G.G. (1997), "Relationships among owner/manager personal values, business strategies, and enterprise performance", *Journal of Small Business Management*, Vol. 35 No. 2, pp. 37-64.
- Kukanja, M. (2013), "Influence of demographic characteristics on employee motivation in catering companies", *Tourism and Hospitality Management*, Vol. 19 No. 1, pp. 97-107.
- Lan, G., Gowing, M., McMahon, S., Rieger, F. and King, N. (2008), "A study of the relationship between personal values and moral reasoning of undergraduate business students", *Journal of Business Ethics*, Vol. 78 Nos 1/2, pp. 121-139.
- Lan, G., Okechuku, C., Zhang, H. and Cao, J. (2013), "Impact of job satisfaction and personal values on the work orientation of Chinese accounting practitioners", *Journal of Business Ethics*, Vol. 112 No. 4, pp. 627-640.
- Lee, D. and Trail, G. (2011), "The influence of personal values and goals on cognitive and behavioral involvement in sport", *Journal of Sport Management*, Vol. 25 No. 6, pp. 593-605.
- Linz, S.J. (2004), "Motivating Russian workers: analysis of age and gender differences", *Journal of Socio-Economics*, Vol. 33 No. 3, pp. 261-289.
- McCrae, R.R. and Allik, J. (2002), *The Five-Factor Model of Personality Across Culture*, Springer Science Business Media, New York, NY.
- McCrae, R.R. and Costa, P.T. (1989), "Reinterpreting the myers-briggs type indicator from the perspective of the five-factor model of personality", *Journal of Personality*, Vol. 57 No. 1, pp. 17-40.
- McCuen, R.H. (1998), "Balancing corporate and personal values", *Journal of Management in Engineering*, Vol. 13 No. 2, pp. 40-44.
- McCuen, R.H. and Pritchard, M.S. (1983), "Association between personal and professional values", *Journal of Professional Issues in Engineering*, Vol. 109 No. 1, pp. 1-9.
- Oyedele, L.O. (2013), "Analysis of architects' demotivating factors in design firms", *International Journal of Project Management*, Vol. 31 No. 3, pp. 342-354.
- Parks, L. and Guay, R.P. (2012), "Can personal values predict performance? Evidence in an academic setting", *Applied Psychology: An International Review*, Vol. 61 No. 1, pp. 149-173.
- Posner, B.Z. and Schmidt, W.H. (1992), "Values and the American manager: an update updated", *California Management Review*, Vol. 34 No. 3, pp. 80-94.
- Quenk, N. (2009), *Essentials of Myers-Briggs Type Indicator Assessment*, 2nd ed., John Wiley and Sons, Inc, Hoboken, NJ.
- Rassin, M. (2008), "Nurses' professional and personal values", *Nursing Ethics*, Vol. 15 No. 5, pp. 614-630.
- Rice, G. (2006), "Individual values, organizational context, and self-perceptions of employee creativity: evidence from Egyptian organizations", *Journal of Business Research*, Vol. 59 No. 2, pp. 233-241.
- Richards, L.G. (1998), "Stimulating creativity: teaching engineers to be innovators", *Proceedings of 1998 IEEE Frontiers in Education Conference*, Vol. 3, pp. 1034-1039.
- Rokeach, M. (1973), *The Nature of Human Values*, The Free Press, New York, NY.
- Schmidt, W.H. and Posner, B.Z. (1982), "Managerial values and expectations: the silent power in personal and organizational life", An AMA Survey report, American Management Association, New York, NY.
- Schwartz, S.H. (1994), "Are there universal aspects in the content and structure of values?", *Journal of Social Issues*, Vol. 50 No. 4, pp. 19-45.

-
- Schwartz, S.H. (2009), "Basic Human Values", *Cross-National Comparison Seminar on the Quality and Comparability of Measures for Constructs in Comparative Research: Methods and Applications*, Bolzano (Bozen), available at: www.scribd.com/doc/37626292/Shalom-Schwartz-1
- Schwartz, S.H. (1992), "Universals in the content and structure of values: theoretical advances and empirical tests in 20 countries", *Advances in Experimental Social Psychology*, Vol. 25 No. 1, pp. 1-65.
- Senior, B. and Swailes, S. (1998), "A comparison of the belbin self perception inventory and observer's assessment sheet as measures of an individual's team roles", *International Journal of Selection and Assessment*, Vol. 6 No. 1, pp. 1-8.
- Sousa, C.M., Coelho, F. and Guillamon-Saorin, E. (2012), "Personal values, autonomy, and self-efficacy: evidence from frontline service employees", *International Journal of Selection and Assessment*, Vol. 20 No. 2, pp. 159-170.
- Stackman, R.W., Connor, P.E. and Becker, B.W. (2006), "Sectoral ethos: an investigation of the personal values systems of female and male managers in the public and private sectors", *Journal of Public Administration Research and Theory*, Vol. 16 No. 4, pp. 577-597.
- Steenhaut, S. and Kenhove, P. (2006), "An empirical investigation of the relationships among a consumer's personal values, ethical ideology and ethical beliefs", *Journal of Business Ethics*, Vol. 64 No. 2, pp. 137-155.
- Structural Engineering Institute, American Society of Civil Engineers (2013), "A vision for the future of structural engineering and structural engineers: a case for change", A Board of Governors Task Committee Paper, Structural Engineering Institute, American Society of Civil Engineers.
- Stouffer, W.B., Russell, J.S. and Oliva, M.G. (2004), "Making the strange familiar: creativity and the future of engineering education", *Proceedings of the 2004 American Society for Engineering Education Annual Conference and Exposition, 20-23 June, Salt Lake City, UT*, available at: <https://peer.asee.org/13891>
- Suar, D. and Khuntia, R. (2010), "Influence of personal values and value congruence on unethical practices and work behavior", *Journal of Business Ethics*, Vol. 97 No. 3, pp. 443-460.
- Survey of Construction Industry Ethical Practices (2004), "FMI/CMAA survey of construction industry ethical practices", FMI Management Consultant for the Construction Industry and Construction Management Association of America, Raleigh, NC, pp. 1-18.
- Sverdlik, N. (2012), "The content of internal conflicts: a personal values perspective", *European Journal of Personality*, Vol. 26 No. 1, pp. 30-44.
- Urosevic, S. and Milijic, N. (2012), "Influence of demographic factors on employee satisfaction and motivation", *Organizacija*, Vol. 45 No. 4, pp. 174-182.
- Wong, S., Siu, V. and Tsang, N. (1999), "The impact of demographic factors on Hong Kong hotel employees' choice of job-related motivators", *International Journal of Contemporary Hospitality Management*, Vol. 11 No. 5, pp. 230-242.

Corresponding author

David Arditi can be contacted at: arditi@iit.edu

For instructions on how to order reprints of this article, please visit our website:

www.emeraldgrouppublishing.com/licensing/reprints.htm

Or contact us for further details: permissions@emeraldinsight.com