

# How personality traits influence management styles of construction project managers

Personality  
traits of  
construction  
PMs

453

Florence Y.Y. Ling and Zhe Zhang  
*Department of Building, School of Design and Environment,  
National University of Singapore, Singapore, Singapore, and*  
Wei Ting Wong  
*Jurong Town Corporation, Singapore, Singapore*

Received 10 October 2019  
Revised 24 January 2020  
2 April 2020  
Accepted 12 May 2020

## Abstract

**Purpose** – This research investigates the dominant personality traits of construction project managers (PMs) and how their personality influences their management styles.

**Design/methodology/approach** – An industry-wide survey with 70 PMs was conducted in Singapore. The survey data were subjected to inferential statistical tests. In-depth interviews were conducted with four subject matter experts.

**Findings** – Majority of the sample PMs are male with age, education level and experience well spread. The dominant personality traits of PMs are found to be: high in Extraversion, Agreeableness, Conscientiousness and Openness and low in Neuroticism. PMs adopt “team leadership” style in which they place high emphasis on both the work that they need to complete and the people they lead. Their Agreeableness and Conscientiousness may improve over time.

**Research limitations/implications** – The correlations and regressions cannot prove causality.

**Practical implications** – It is discovered that PMs who have high conscientiousness and high openness personalities are more likely to be leaders who are concerned for both the people that they lead and production outcomes. The implication is that employers may wish to conduct personality tests at the time of hiring to ensure good job match.

**Originality/value** – This study is novel because it integrated two areas of knowledge – personality traits and management style. The regression analysis discovered that Openness and Conscientiousness traits may be used to predict PMs’ management styles. This suggests that if personality tests are administered at hiring stage, the outcomes may be used to match potential hires to the jobs that they are being considered for.

**Keywords** Management style, Personality traits, Construction projects, Project managers

**Paper type** Research paper

## 1. Introduction

The success of construction projects is affected by the management style of construction project managers (PMs) (Yang *et al.*, 2011). PMs handling construction projects need to ensure projects are completed in a timely manner, within budget and to an acceptable level of quality, which can be considered as “concern for production” (Akhavan Tabassi *et al.*, 2014). Projects comprise a team of people that PMs need to manage, so they need to have “concern for people”. The two dimensions (concern for production and concern for people) are underpinned by Blake and Mouton’s (1964) managerial grid. PMs need to adopt both



The authors acknowledge the use of Blake and Mouton (1964) Management Styles Questionnaire and John and Srivastava’s (1999) 44-question Big Five personality test.

*Data availability:* Data generated or analysed during the study are available from the corresponding author by request.

Built Environment Project and  
Asset Management  
Vol. 10 No. 3, 2020  
pp. 453-468  
© Emerald Publishing Limited  
2044-124X  
DOI 10.1108/BEPAM-09-2019-0086

dimensions to ensure that people are motivated to perform and project objectives are achieved.

Each PM has distinctive character and disposition which relate to their personality traits. Personality affects a person's behaviour and values (Fischer and Boer, 2015), job performance (Carr *et al.*, 2003) and project outcomes (Saade *et al.*, 2015). Certain personality traits correlate with specific behavioural styles, and often, each personality trait has both positive and negative behavioural styles (John and Srivastava, 1999). The personality characteristics also affect the outcome of projects (Aitken and Crawford, 2008).

The aim of this research is to investigate the dominant personality traits of PMs and how personality influences their management styles. In the context of construction projects in Singapore, the specific objectives are to: identify the dominant management style and personality traits of PMs; examine the association between management style and personality traits; and explore whether there are differences in management styles and personality traits for PMs with different demographic characteristics. The association between personality traits and management style (Judge *et al.*, 2002) may inform construction organisations on how to match jobs to staff with suitable personality traits to be appointed as PMs. The variances in personality traits of people with different demographic characteristics such as age and experience may help to identify which traits can be developed over time (Roberts *et al.*, 2003).

## 2. Literature review

### 2.1 Management styles

Management style is the way to provide direction, execute plans and inspire people (Newstrom and Davis, 1993). Several methods exist to categorise different management styles. Among these, the managerial grid (Blake and Mouton, 1964) was selected for this study because of the ease of survey administration, two-factorial study approach and proven reliability (Dwivedi, 1995). Managerial grid has been used in many studies, especially on organisational development (Ronald, 2014). This grid has also been used to study leadership styles' relationships with conflict management style (Darshani, 2016), emotional intelligence (Khan *et al.*, 2015) and job satisfaction (Josanov-Vrgovic and Pavlovic, 2014).

Blake and Mouton's (1964) managerial grid comprises two dimensions: concern for production and concern for people. "Concern for production" dimension measures the extent to which a manager focusses on objectives, efficiency and productivity. "Concern for people" dimension measures the extent to which a manager considers team members' needs, interests and personal development.

Based on the scores of Blake and Mouton's (1964), two dimensions, five managerial styles are derived. The managerial styles are: "Task Management"; "Country Club Management"; "Middle of the Road"; "Impoverished Management"; and "Team leadership". Individuals who practice Team leadership are often regarded as more suitable as leaders (De Mascia, 2015).

### 2.2 Personality traits

Personality traits indicate basic aspects on which people differ (Matthews *et al.*, 2003). Personality traits are largely responsible for individuals' values, behaviour, motivation and perception (Marcus *et al.*, 2013). Many personality trait measures have been developed, including: Myers-Briggs Type Indicator (MBTI) (Cohen *et al.*, 2013), Multidimensional Personality Questionnaire (George and Zhou, 2001) and the five-factor model of personality (Cobb-Clark and Schurer, 2012), also known as the "Big Five".

The Big Five traits are: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience. The Big Five is adopted in this study because it allows for cross-cultural generalisability (Rolland, 2002) and the measurement is also stable (Cobb-Clark and Schurer, 2012). It has produced consistent results with various population (McCrae and Terracciano, 2005). John and Srivastava's (1999) 44-question Big Five personality test is adopted for this study as it is a widely used measurement scale. Personality studies have focussed on extraversion (McCabe and Fleeson, 2012); agreeableness (Chernyshenko *et al.*, 2011; Bono and Judge, 2004); conscientiousness (Chernyshenko *et al.*, 2011); neuroticism (Chernyshenko *et al.*, 2011); and openness to experience (Nelson and Rawlings, 2010).

Personality tests have been used to discover the success factors for PMs from construction (Mader *et al.*, 2012) and banking (Cohen *et al.*, 2013) sectors. However, these studies are based on MBTI, instead of the Big Five. Aitken and Crawford (2008) discovered important characteristics for successful PMs from a variety of industries but the characteristics are based on 32 descriptive words.

### 3. Knowledge gap

The literature review shows that studies have been conducted on personality traits and management styles of managers and leaders. Judge *et al.* (2002) explored the correlation between personality traits and management style based on a meta-analysis of 222 published studies. The studies focussed on personality traits of community leaders (Barbuto and Wheeler, 2006), design architects and engineers (Carr *et al.*, 2002; Giritli and Civan, 2008). Atalah (2014) found no difference in the personality traits among estimators and PMs except in two traits: human services and gregariousness. Hassan *et al.* (2017) found that Extraversion, Agreeableness and Openness to Experience are positive predictors for health and education PMs in Pakistan.

However, the gap is that hitherto, there are no comprehensive studies that investigate empirically the association between dominant personality traits and management styles of PMs in construction projects. The fieldwork was conducted to fill this gap.

The research questions are as follows:

- Q1. What is the dominant management style of PMs?
- Q2. Can personality trait be used to predict management style of PMs?
- Q3. Are there differences in personality traits and management styles of PMs with different demographic characteristics?

### 4. Research method

A two-pronged research method was employed: questionnaire survey and in-depth interviews. The questionnaire survey is chosen because it allows a large number of subjects to be studied and can derive information which is hard to measure using observational techniques (McIntyre, 2011). In addition, the measurements of management style and personality traits are based on existing scales where data is obtained through survey. The interviews were conducted with subject matter experts to validate and seek explanations for the survey results. A questionnaire with three sections was developed. The first section gathered the management behavioural styles that respondents adopt in managing construction projects. Based on Blake and Mouton's (1964) Management Styles Questionnaire from the literature review, respondents were asked to rate the extent to which each of the 18 questions was applicable to them, on a five-point Likert scale (1 = strongly disagree; 3 = neutral; 5 = strongly agree). Following Blake and Mouton (1964), the ratings for

the nine questions relating to “concern for people” were then added up and multiplied by 0.2 (0.2 was used so that the highest score from nine questions can be normalised to nine, see notes in Table 3). An example of a question relating to “concern for people” is “I enjoy coaching people on new tasks and procedures”. Ratings that tend towards 1 and 5 would indicate low and high concern for people, respectively. The same was done for the ratings of the nine questions relating to “concern for production”.

The second section sought information on the personality traits of respondents, based on John and Srivastava’s (1999) 44-question Big Five personality test. The breakdown is as follows: Extraversion, eight questions; Agreeableness, nine questions; Conscientiousness, nine questions; Neuroticism, eight questions; and Openness, ten questions. Respondents were asked to rate the extent to which each question was applicable to them, on a five-point Likert scale (1 = strongly disagree; 3 = neutral; 5 = strongly agree). The ratings for the group of questions relating to a certain personality trait were added up and divided by the number of questions in the group, to derive a mean. An example of a question to determine Extraversion is “I see myself as full of energy”. Ratings that tend towards 1 and 5 would indicate introversion and extraversion, respectively.

The third section asked for their personal particulars (see Table 1). Before the distribution of the questionnaires, a pilot test with three leaders in the construction industry with at least

Description	Frequency	%
<i>Gender</i>		
Male	61	87.1
Female	9	12.9
<i>Education level</i>		
Below diploma	8	11.4
Diploma	21	30.0
Bachelor’s degree	35	50.0
Above bachelor	6	8.6
<i>Age Range</i>		
21–30	12	17.1
31–40	14	20.0
41–50	19	27.1
51–60	20	28.6
Above 60	5	7.1
<i>Seniority</i>		
Entry-level management	34	48.6
Middle-level management	10	14.3
Senior-level management	26	37.1
<i>Years of experience in the construction industry</i>		
1–10	26	37.1
11–20	15	21.4
21–30	23	32.9
Above 30	6	8.6
<i>Years as a leader/manager in the construction industry</i>		
1–10	44	62.9
11–20	16	22.9
21–30	9	12.9
Above 30	1	1.4

**Table 1.**  
Profile of respondents

five years of management experience was conducted. From the pilot test, minor changes were made to improve clarity.

The population comprised professionals in the construction industry who had managed a project team or a team of workers for at least three years in Singapore. As there is no formal register of PMs in Singapore, the population is not known and a scientific way to calculate sample size could not be done. Instead, samples were randomly selected from the lists of contractors and builders who are registered or licensed with the Singapore's Building and Construction Authority. Convenience and snowball sampling were also used to increase the sample size. The potential respondents were approached in person and through online means. Those approached in person completed the hardcopy questionnaires. The questionnaire was also mounted on using Google Forms. Potential respondents were contacted through email, Facebook, WhatsApp and text messages. A total of 280 sets of questionnaires were sent out and 70 completed questionnaires were received, giving a response rate of 25%.

In-depth interviews were conducted with four subject matter experts who were carefully selected PMs with at least 20 years of industry experience and ten years as PMs in the construction industry. The interviews comprised open-ended questions, asking interviewees if they agreed with the statistical results and the reasons for the observed results.

The SPSS software was used for data analysis. Following [Hwang et al. \(2015\)](#), one-sample *T*-test was conducted to determine the dominant management styles and personalities. For each question, the null and alternative hypotheses were as set out as follows, where  $\mu$  is the population mean.

Null hypothesis  $H_0: \mu \leq \mu_0$ . The decision rule was to accept  $H_0$  when  $p \geq 0.05$ . Alternative hypothesis  $H_1: \mu > \mu_0$ . The hypothetically assumed value ( $\mu_0$ ) is a theoretically derived value which is the mid-point of the scale.  $\mu_0$  was set at 5.4 and 3 for *t*-tests relating to management styles and personality traits, respectively (see notes in [Table 3](#)). The decision rule was to reject  $H_0$  and accept  $H_1$  when the *t*-value is positive at  $p < 0.05$ . It is then concluded that the population mean is significantly higher than  $\mu_0$ . If the null hypothesis is rejected, the result is considered as significant.

Pearson's correlation and multiple linear regression (MLR) were conducted to explore the association between management styles and personalities. ANOVA was conducted to examine the differences of personality traits and management styles based on different demographic characteristics.

## 5. Characteristics of the sample

[Table 1](#) shows the characteristics of the sample. The majority of the respondents (87%) are male, have at least a bachelor's degree (59%) and are above 40 years old (63%). About half (51%) of the respondents hold middle- or senior-level management roles. 42% of the respondents have working experience of more than 20 years, while 37% of them have been PMs for more than ten years in the construction industry.

Interviewee code	Nationality	Speciality	Work experience (years)	Years as PM
A1	China	Civil Engineer	26	19
A2	Malaysia	Construction Manager	23	21
A3	Singapore	Project Manager	22	14
A4	Singapore	Senior Project Manager	27	16

**Table 2.**  
Profile of interviewees  
working in Singapore's  
construction industry

The four subject matter experts who were interviewed have been in management position for between 14 and 21 years, with an average of 17.5 years (see Table 2). This indicates that the interviewees are experienced, have deep management knowledge and are well suited to inform the research. The views of the experts were analysed using content analysis, whereby the verbal data were categorised, summarised and thereafter included in relevant parts of the discussion relating to the statistical analysis.

## 6. Results

Shapiro–Wilk test was conducted and the data was found to be from a normal distribution. The data were tested for internal consistency. Cronbach’s alphas for management and personality measurement items were found to be 0.836 and 0.812. These exceed the threshold level of 0.7 (Nunnally, 1978), indicating a high degree of internal reliability.

Objective 1 was to identify the dominant management style and personality traits of PMs. This was done using the one-sample *T*-test explained earlier. The results show significantly high scores for both “concern for people” ( $Y_1$ ) and “concern for production” ( $Y_2$ ) (see Table 3). Correlation analysis showed that  $Y_1$  and  $Y_2$  are significantly correlated ( $r = 0.756, p = 0.000$ ). Each respondent’s  $Y_1$  and  $Y_2$  scores were plotted in Figure 1, and all the data points fall in the “Team leadership” quadrant of Mouton and Blake’s (1964) managerial grid. The answer to research question 1 is that the dominant management style of PMs is one that values both the people they manage and the production output highly.

Using both the mean values and one-sample *T*-test results, PMs’ dominant personality traits are observed to be very high in Agreeableness ( $P_2$ ) and Conscientiousness ( $P_3$ ) and low in Neuroticism ( $P_4$ ) (see Table 3). They also exhibit Extraversion ( $P_1$ ) and Openness to Experience ( $P_5$ ) to a moderate extent. Therefore, generally speaking, PMs lean towards expressive, optimistic, active, tolerant, cooperative, responsible, hardworking, creative and emotionally stable.

Objective 2 was to discover the association between management style and personality traits of PMs. Pearson’s correlation analysis was conducted, and the results in Table 4 show

Code	Management dimension <sup>(1)</sup>	Mean <sup>(2)</sup>	<i>t</i> value <sup>(3)</sup>	Degree of freedom	Sig (2-Tailed)
$Y_1$	Concern for people	7.35	22.618	69	0.000
$Y_2$	Concern for production	7.13	20.485	69	0.000
	Personality trait <sup>(4)</sup>	Mean <sup>(5)</sup>	<i>t</i> value <sup>(6)</sup>		
$P_1$	Extraversion	3.38	6.338	69	0.000
$P_2$	Agreeableness	3.89	18.985	69	0.000
$P_3$	Conscientiousness	3.85	13.050	69	0.000
$P_4$	Neuroticism	2.52	-8.249	69	0.000
$P_5$	Openness	3.48	10.733	69	0.000

**Note(s):** <sup>1</sup>Each dimension comprises nine questions, rated on a five-point scale (1–5)

<sup>2</sup>Mean =  $0.2 * (\text{sum of ratings from all questions in the dimension})$ . Maximum mean =  $0.2 * 9 * 5 = 9$ . Minimum mean =  $0.2 * 9 * 1 = 1.8$

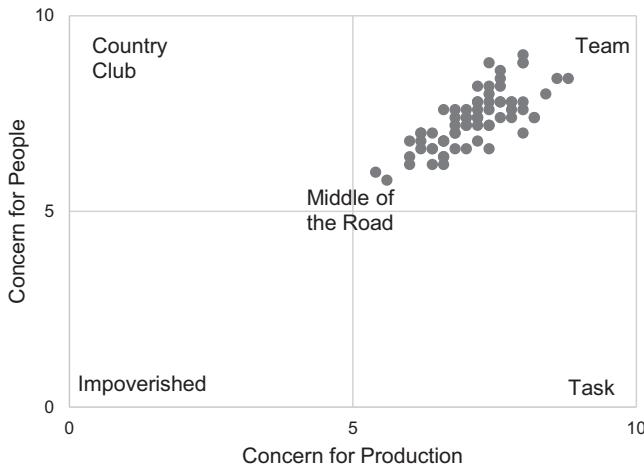
<sup>3</sup>Test value for one sample *t*-test set at 5.4 (being mid-point of 1.8 and 9)

<sup>4</sup>Each personality trait comprises 8–10 questions, rated on a five-point scale (1–5)

<sup>5</sup>Mean =  $(\text{sum of ratings from all questions in the trait}) \div \text{number of questions in the trait}$ . Minimum and maximum means are 1 and 5, respectively

<sup>6</sup>Test value for one sample *t*-test set at 3 (being mid-point of 1 and 5)

**Table 3.**  
Statistics of  
management style and  
personality traits



**Figure 1.** Locations of samples based on Blake and Mouton's Managerial Grid (1964)

Personality trait	$Y_1$ : Concern for people		$Y_2$ : Concern for production	
	Correlation coefficient	Two-tail sig.	Correlation coefficient	Two-tail sig.
$P_1$ : Extraversion	0.241*	0.045	0.368**	0.002
$P_2$ : Agreeableness	0.253*	0.034	0.208	0.084
$P_3$ : Conscientiousness	0.370**	0.002	0.499**	0.000
$P_4$ : Neuroticism	-0.172	0.154	-0.353**	0.003
$P_5$ : Openness	0.555**	0.000	0.565**	0.000

**Note(s):** \*represents significance <0.05 \*\*represents significance <0.01

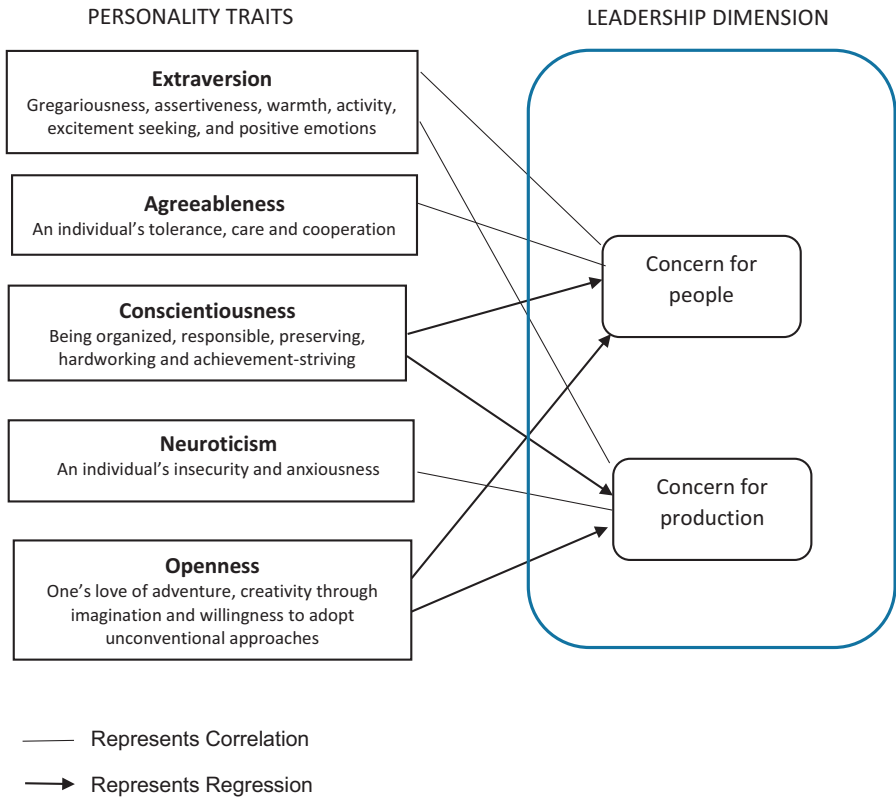
**Table 4.** Pearson's correlation analysis between management dimensions and personality traits

Dep variable	Indep variable	$\beta$	$\sigma$	$b$	$t$ value	$p$ value	$R^2$	Adj $R^2$
$Y_1$ : Concern for people	Constant	2.959	0.737	NA	4.014	0.000	Model 1:	
	$P_5$ Openness	0.948	0.202	0.487	4.685	0.000	0.308	0.298
	$P_3$ Conscientiousness	0.285	0.138	0.215	2.068	0.043	Model 2:	0.350 0.330
$Y_2$ : Concern for production	Constant	2.351	0.676	NA	3.480	0.001	Model 1:	
	$P_5$ Openness	0.864	0.185	0.452	4.661	0.000	0.320	0.310
	$P_3$ Conscientiousness	0.463	0.127	0.355	3.657	0.001	Model 2:	0.433 0.416

**Note(s):** Regression coefficient ( $\beta$ ) is calculated using stepwise method. Standard error ( $\sigma$ ) of variable regression coefficient measures the dispersion of regression coefficient over sampling distribution. Standardised regression coefficient ( $b$ ) allows for equal comparison of coefficient weights, when the constant is removed. Value of  $t$ -statistic, to be compared to the theoretical  $t$ -distribution for accuracy.  $p$  is significance of  $t$ -statistic. For significance <0.05, the null hypothesis that  $\beta = 0$  is rejected. There is less than 5% chance that  $t$ -statistic is wrong due to random occurrence.  $R^2$  is the coefficient of determination

**Table 5.** Predicting management dimensions using personality traits





**Figure 2.**  
Correlation and  
regression results

**Note(s):** Personality descriptions based on [Chemysenko et al. \(2011\)](#)

that all personality traits are significantly correlated with both concern for people ( $Y_1$ ) and concern for production ( $Y_2$ ) dimensions. MLR analysis was conducted to identify the personality traits that may explain the behavioural dimensions (see [Table 5](#)). The relationships are also presented in [Figure 2](#).

[Table 4](#) shows that Conscientiousness ( $P_3$ ) and Openness to Experience ( $P_5$ ) traits are each significantly correlated ( $p < 0.01$ ) with both  $Y_1$  and  $Y_2$ . Regression results in [Table 5](#) show that these two personality traits explain 33% of a PM's "concern for people" ( $Y_1$ ) dimension. Furthermore, these two personality traits explain 42% of a PM's "concern for production" ( $Y_2$ ) dimension. The answer to research question 2 is that personality traits may be used to predict management style of PMs, as the results show that Conscientiousness and Openness traits explain PMs' management style to a large extent.

Objective 3 was to explore whether there are differences in management styles and personality traits for PMs with different demographic characteristics. The respondents were divided into various groups, and ANOVA was conducted to examine the differences of personality traits and management styles based on different demographic characteristics (see [Table 6](#)). The answer to research question 3 is that there are differences based on different age groups, management level, experience and nationality.



Personalities	Category	N	Mean	F-value	Significance
<i>Age (years old)</i>					
$P_2$ : Agreeableness	Age 21–40	26	3.78	4.781	0.034
	Age above 50	25	4.01		
$P_3$ : Conscientiousness	Age 21–40	26	3.63	6.944	0.011
	Age above 50	25	4.04		
$P_4$ : Neuroticism	Age 21–40	26	2.67	5.567	0.022
	Age above 50	25	2.35		
$Y_1$ : Concern for people	Age 21–40	26	7.21	0.563	0.457
	Age above 50	25	7.36		
$Y_2$ : Concern for production	Age 21–40	26	7.05	0.019	0.892
	Age above 50	25	7.07		
<i>Management level</i>					
$P_1$ : Extraversion	Junior	34	3.28	–2.009	0.049
	Senior	26	3.54		
$P_2$ : Agreeableness	Junior	34	3.81	–2.386	0.020
	Senior	26	4.05		
$P_3$ : Conscientiousness	Junior	34	3.71	–2.847	0.006
	Senior	26	4.09		
$Y_1$ : Concern for people	Junior	34	7.26	2.350	0.131
	Senior	26	7.55		
$Y_2$ : Concern for production	Junior	34	7.07	1.426	0.237
	Senior	26	7.29		
<i>Experience in construction industry (years)</i>					
$P_2$ : Agreeableness	1–10	26	3.74	8.305	0.006
	Above 20	29	4.05		
$P_3$ : Conscientiousness	1–10	26	3.69	6.218	0.016
	Above 20	29	4.05		
$P_4$ : Neuroticism	1–10	26	2.68	7.997	0.007
	Above 20	29	2.33		
$Y_1$ : Concern for people	1–10	26	7.26	0.952	0.334
	Above 20	29	7.46		
$Y_2$ : Concern for production	1–10	26	7.17	0.000	0.987
	Above 20	29	7.17		
<i>Years as a leader/manager in the construction industry</i>					
$P_2$ : Agreeableness	1–10	44	3.79	10.138	0.002
	Above 10	26	4.08		
$P_3$ : Conscientiousness	1–10	44	3.74	4.442	0.039
	Above 10	26	4.02		
$P_4$ : Neuroticism	1–10	44	2.62	5.267	0.025
	Above 10	26	2.36		
$Y_1$ : Concern for people	1–10	44	7.29	0.831	0.365
	Above 10	26	7.45		
$Y_2$ : Concern for production	1–10	44	7.10	0.206	0.651
	Above 10	26	7.18		
<i>Nationality</i>					
$P_5$ : Openness	Singaporean	48	3.42	–2.011	0.048
	Non-Singaporean	22	3.60		

**Table 6.** Significant ANOVA results on PMs' personality and management style

## 7. Discussion

The results are now discussed.

### 7.1 Management style of PMs

The finding that PMs have significantly high concerns for production and also for people indicates that the predominant management style is “team leadership” style (see Figure 1). This is in agreement with Akhavan Tabassi *et al.*'s (2014) study of Iranian construction PMs who are also classified as “team leadership”. The implication is that construction organisations should train junior project managers to focus on both production and people, when managing construction projects. Using workshops, role plays and other experiential learning methods, PMs may be trained in: building effective relationships through collaboration; building and gaining trust; solving problem; resolving conflicts; and managing change (Duggan, 2018). PMs may also adopt relationally integrated value networks (RIVANS) to engage and empower network members towards well-focussed collaboration that adds value (Kumaraswamy *et al.*, 2010).

### 7.2 Association between personality traits and management style

The results in Tables 4 and 5 show that PMs who are higher in Conscientiousness ( $P_3$ ) trait have higher concern for both people ( $Y_1$ ) and for production ( $Y_2$ ). Highly conscientious PMs are responsible, dependable (Zopiatis and Constanti, 2012), trustworthy and willing to lend a helping hand (Marinova *et al.*, 2012), thereby showing that they are a “people person”.

Interviewee A1 shared that PMs high in Conscientiousness trait have the ability to consider workers' well-being while completing tasks at hand. According to interviewee A2, these PMs would submit requests for extension of time or written instructions for change orders promptly and track them closely. These PMs network with other professionals and colleagues over meals to maintain good working relationships and garner their cooperation to achieve project goals. Interviewee A4 opined that:

Conscientiousness trait in PMs is extremely important as it drives them to work very hard to solve problems and achieve project goals. Seeing how hard their PMs work, subordinates would then do their best and a strong bond is formed between followers and PMs.

Table 4 shows that PMs with high Openness to Experience ( $P_5$ ) trait are more likely to have high concern for people ( $Y_1$ ) and high concern for production ( $Y_2$ ), explaining 30 and 31% for  $Y_1$  and  $Y_2$ , respectively. Their concern for people is important because they need to work with people from varied backgrounds, including professionals with different specialisations, and people from different companies. By being open, they listen and take in expert opinions (Flynn, 2005) and thereby make better decisions. These managers are effective because they are open to followers' new ideas which encourages them to strive hard to complete the tasks at hand (Judge *et al.*, 2002).

PMs with high Openness are adaptable to changes in technologies, customer demands and the environment and are able to create new solutions to fulfil task requirements (Costa and McCrae, 1992). This finding is confirmed by interviewee A2 who shared that PMs with high Openness to Experience are more receptive to new ideas and methods and make changes to human resource, construction method or technology as the situation changes. Interviewee A3 added that these PMs can help their companies adopt new technologies and gain comparative advantage over others.

Extraversion ( $P_1$ ) trait is significantly correlated with both “concern for people” ( $Y_1$ ) and “concern for production” ( $Y_2$ ) dimensions (see Table 4). PMs who have high extraversion trait motivate their teams to strive for success through their boundless energy and assertiveness

(Judge *et al.*, 2002). Extraverted leaders tend to be assertive in the delegation of work, articulation of vision and plans (Judge *et al.*, 2002), inspiring employees to be enthusiastic about their work (Grant *et al.*, 2011) and synching with the organisation's direction (Barbuto and Wheeler, 2006). Interviewee A2 shared that:

Extroverted PMs interact intensely with their peers and subordinates. They negotiate in a friendly manner without harming personal relations with peer or subordinates. They are assertive and do not feel guilty in pushing people to complete tasks.

Agreeableness ( $P_2$ ) trait is significantly correlated with "concern for people" ( $Y_1$ ) dimension, but not  $Y_2$  (see Table 4). PMs with high Agreeableness trait exhibit this by forming close relationships with people and showing concern for their well-being (Bowling *et al.*, 2005). Agreeableness trait leads to greater care and awareness for the well-being of individual's working partners (Bowling *et al.*, 2005).

Interviewee A4 identified agreeable PMs as those who are usually very concerned about the well-being of workers and are very well-liked for their friendly demeanour. Unfortunately, agreeable PMs may sometimes be seen as weak PMs due to their lack of decisiveness in decision-making as they often consider the feelings of their workers when making decisions (Interviewee A3). This may explain the lack of significant correlation between Agreeableness trait and "concern for production" ( $Y_2$ ) dimension.

Neuroticism ( $P_4$ ) trait is significantly and negatively correlated with "concern for production" ( $Y_2$ ) dimension (see Table 4). This suggests that PMs who are highly neurotic may have low concern for production outputs, confirming Bono and Judge's (2004) finding. PMs with high Neuroticism trait do not provide the right conditions for subordinates to complete their tasks because they exhibit emotional instability, anxiousness and insecurity (Costa and McCrae, 1992). These people are not effective because they lack self-confidence, which is a necessary trait for leaders (Cremer and Knippenberg, 2004). Interviewee A3 shared that:

PMs with high Neuroticism usually have either low self-esteem or big ego. These PMs have the tendency to exhibit erratic behaviour that brings down the morale of the team. They are unable to accept criticism with an open mind. Instead of changing their ways for the better after receiving criticisms, they become unreasonably harsh on their subordinates or make irrational decisions. High Neuroticism in PMs often translates to poor team performance.

### 7.3 What are the antecedents of personality traits and management styles?

The ANOVA results in Table 6 show that as PMs become older and/or more experienced, some aspects of their personality improved, namely becoming more agreeable, more conscientious and less neurotic. The significantly higher Agreeableness ( $P_2$ ) and Conscientiousness ( $P_3$ ) scores for older and more experienced PMs confirm the maturity principle (Roberts *et al.*, 2001). Senior-level managers have ample opportunities to develop their agreeableness trait because they need to deal with a larger number of people and persuade them to align their goals to project goals (Ng and Feldman, 2008). They develop their conscientiousness trait by virtue of being in senior management which comes with more responsibilities and handling more complex tasks.

Interviewee A1, being the oldest among the four interviewees, shared that as PMs grow older, they would experience more ups and downs in life. These life experiences motivate them to treat people better (i.e. become more agreeable) and adopt better work attitude (i.e. higher conscientiousness). Interviewee A4 shared that as one accumulates more working experience, one learns to be more agreeable in order to deal with different types of people at

work. There may also be a need to change their management role appropriately to suit the needs of each team development stage (Senaratne and Samaraweera, 2015).

The ANOVA results in Table 6 show that PMs in older age group or with more experience are less neurotic ( $P_4$ ). This may also be explained by the maturity principle (Roberts *et al.*, 2001), which posits that as people grow, they become more emotionally stable and have lower Neuroticism (Roberts *et al.*, 2003). The risks and problems which PMs experience through years of work train them to regulate their emotions better. Interviewee A2 explained that over the years, PMs would gradually learn to regulate their emotions because they are role models and shoulder the responsibility of motivating others.

The ANOVA results in Table 6 show that senior PMs have significantly higher Extraversion ( $P_1$ ) score than junior PMs. This agrees with Moutafi *et al.*'s (2007) study which found that extroverted people are those in higher management positions, who are dominant, confident and sociable. Interviewee A2 shared that one criterion to be a senior PM is to be able to build relationships and this is facilitated by the Extraversion trait.

The ANOVA results show that Openness ( $P_5$ ) does not change significantly as PMs become older and more experienced or move up the career ladder. This suggests that at the point of hiring, employers may need to consider job fit of candidates, that is, those with low openness trait may not change as it is not a trait that can easily be improved upon. It is important to do job match as  $P_5$  (high openness trait) explains 30 and 31% of PMs' style in having high concern for people ( $Y_1$ ) and production ( $Y_2$ ), respectively (see Table 5).

While the Openness ( $P_5$ ) trait does not change with age, there is a significant difference between openness level of Singaporean and non-Singaporean PMs – non-Singaporean PMs have significantly higher Openness than Singaporean PMs (see Table 6). This result is consistent with Polek *et al.*'s (2011) finding about “migrant personality” which has existed prior to emigration. Those that are not open might not have left their home countries to emigrate to Singapore. Interviewee A2, a Malaysian, confirmed that he came to Singapore with an open mind to learn and experience something new. Interviewee A4, a Singaporean, shared that Singaporeans are less open because they are more afraid of failure. Many tend to follow their predecessors and do not want to seek for alternatives or create new methods.

Table 6 shows no significant differences of management styles of respondents with different demographic characteristics such as age, seniority, years of experience in the industry and as a leader. The implication is that PMs' concern for people ( $Y_1$ ) and concern for production ( $Y_2$ ) do not change significantly as they become older and more experienced or move up the career ladder. The finding departs from Hakan *et al.*'s (2013) study which found that there are differences in concern for people and production scores for Turkish managers who are of different age, working experience and seniority groups.

The earlier discussion indicates that as PMs become older or more experienced, they have better agreeableness, conscientiousness and extraversion and lower scores in neuroticism. However, the management styles of PMs are not influenced by their age, seniority, years of experience in the industry and as a leader.

## 8. Limitations

One limitation of this study is that it relied on self-reported data for personality traits and management styles. Next, the correlations and regressions also cannot prove causality. Further, the sample size of 70 may be considered as small for this type of study, and the nonprobabilistic sampling may have compromised the results. However, previous studies of similar nature also had relied of sample sizes that are below 100 (e.g. Carr *et al.*, 2002; Cremer and Knippenberg, 2004; and Khan *et al.*, 2015). While generalisation of the findings to other countries should be

done cautiously, the results may be useful to inform countries where the Western PM principles are adopted, and the construction industry is matured, as is the case of Singapore.

## 9. Conclusion

The results in Table 3 show that the sample of 70 PMs have high concern for people ( $Y_1$ ) and high concern for production ( $Y_2$ ). According to Blake and Mouton (1964), when both are high, the management style is labelled as “team leadership” style. This indicates that PMs generally adopt a management style where they pay close attention to both the people they manage and the production output (see Table 3 and Figure 1).

This study discovered that the predominant personality traits of PMs are: very high in Agreeableness and Conscientiousness, high in Extraversion and Openness to Experience and very low in Neuroticism (see Table 3). These personality traits are also significantly correlated with “Concern for people”. Extraversion, Conscientiousness, Neuroticism and Openness are significantly correlated with “Concern for production”.

The contributions to knowledge are as follows. In Blake and Mouton’s (1964) managerial grid, this study stakes out the “team leadership” quadrant as the one where PMs’ management style predominantly lies, with their concern for both the people they manage and the production output (see Figure 1). This study contributes to personality theory by discovering that some personality traits (agreeableness, conscientiousness and neuroticism) may change as one ages, while other personality traits (extraversion and openness) remain constant (see Table 6). The final contribution to knowledge is the discovery that personality traits may be used to explain or predict PMs’ management style (see Table 5 and Figure 2).

The findings of this study have practical implications. Firstly, in deciding which staff is suitable to be appointed as a PM, purposefully avoid the “lone wolves” and go for those who exhibit a high degree of team spirit. Secondly, conduct personality tests during recruitment stage. To hire PMs, identify those with high extraversion and openness. While this might discriminate individuals without high scores in certain personality traits from becoming PMs, in the long run, the individual might be able to find a better fit in other non-PM jobs. The results of the personality tests allow careful job matching, as those who have high openness and conscientiousness are more likely to be concerned for both people and production and are therefore suitable to be PMs. The final practical implication relates to the finding that PMs’ management styles remained similar over the years as they age and climb up the career ladder. This suggests that at the early stage of a person’s career, supervisors should train junior staff in “team leadership” style. They should also be trained to improve their extraversion, agreeableness and conscientiousness traits and reduce their neuroticism trait.

In future, a similar study could be conducted in multiple countries with a larger sample size to find out if national culture affects PMs’ personality traits and management styles. Other instruments to determine personality traits and management styles may be used to triangulate the findings of this study.

## References

- Aitken, A. and Crawford, L. (2008), “Senior management perceptions of effective project manager behavior: an exploration of a core set of behaviors for superior project managers”, *Proceedings of PMI Research Conference*, Project Management Institution, Inc., Warsaw.
- Akhavan Tabassi, A., Ramli, M., Hassan Abu Bakar, A. and Hamid Kadir Pakir, A. (2014), “Transformational leadership and teamwork improvement: the case of construction firms”, *The Journal of Management Development*, Vol. 33 No. 10, pp. 1019-1034.

- Atalah, A. (2014), "Comparison of personality traits among estimators, project managers, and the population", *ASCE Journal of Management in Engineering*, Vol. 30 No. 2, pp. 173-179.
- Barbuto, J.E. and Wheeler, D.W. (2006), "Scale development and construct clarification of servant leadership", *Group and Organisation Management*, Vol. 31 No. 3, pp. 300-326.
- Blake, R. and Mouton, J. (1964), *The Managerial Grid: Key Orientations for Achieving Production through People*, Gulf Pub, Houston, TX.
- Bono, J.E. and Judge, T.A. (2004), "Personality and transformational and transactional leadership: a meta-analysis", *Journal of Applied Psychology*, Vol. 89 No. 5, pp. 901-910.
- Bowling, N.A., Beehr, T.A. and Swader, W.M. (2005), "Giving and receiving social support at work: the roles of personality and reciprocity", *Journal of Vocational Behavior*, Vol. 67 No. 3, pp. 476-489.
- Carr, P.G., Garza, J.M.d.I. and Vorster, M.C. (2002), "Relationship between personality traits and performance for engineering and architectural professionals providing design services", *ASCE Journal of Management in Engineering*, Vol. 18 No. 4, pp. 158-166.
- Chernyshenko, O.S., Stark, S. and Drasgow, F. (2011), "Individual differences: their measurement and validity", in Zedeck, S. (Ed.), *Handbook of Industrial and Organisational Psychology*, American Psychological Association, Washington, DC, pp. 117- 151.
- Cobb-Clark, D.A. and Schurer, S. (2012), "The stability of big-five personality traits", *Economics Letters*, Vol. 115 No. 1, pp. 11-15.
- Cohen, Y., Ornoy, H. and Keren, B. (2013), "MBTI personality types of project managers and their success: a field survey", *Project Management Journal*, Vol. 44 No. 3, pp. 78-87.
- Costa, P.T. Jr and McCrae, R.R. (1992), *NEO PI-R. The Revised NEO Personality Inventory*, Psychological Assessment Resources, Odessa, FL.
- Cremer, D.D. and Knippenberg, D.V. (2004), "Leader self-sacrifice and leadership effectiveness: the moderating role of leader self-confidence", *Organizational Behavior and Human Decision Processes*, Vol. 95 No. 2, pp. 140-155.
- Darshani, R.K.N.D. (2016), "A review of the modes of conflict management and the managerial grid model of leadership", *7th International Conference on Business & Information ICBI – 2016*, Faculty of Commerce and Management Studies, University of Kelaniya, Sri Lanka, Vol. 7.
- De Mascia, S. (2015), "Are women better leaders than men?", *Human Resource Management International Digest*, Vol. 23 No. 7, pp. 1-4.
- Duggan, T. (2018), "Training programs for effective teamwork", Work-Chron.com, available at: <http://work.chron.com/training-programs-effective-teamwork-12359.html> (accessed 03 October 2018).
- Dwivedi, R. (1995), *Organisational Culture and Performance*, MD Publications, New Delhi.
- Fischer, R. and Boer, D. (2015), "Motivational basis of personality traits: a meta-analysis of value-personality correlations", *Journal of Personality*, Vol. 83 No. 5, pp. 491-510.
- Flynn, F.J. (2005), "Having an open mind: the impact of openness to experience on interracial attitudes and impression formation", *Journal of Personality and Social Psychology*, Vol. 88 No. 5, pp. 816-826.
- George, J.M. and Zhou, J. (2001), "When openness to experience and conscientiousness are related to creative behavior: an interactional approach", *Journal of Applied Psychology*, Vol. 86 No. 3, pp. 513-524.
- Giritli, H. and Civan, I. (2008), "Personality study of construction professionals in the Turkish construction industry", *ASCE Journal of Construction Engineering and Management*, Vol. 134 No. 8, pp. 630-634.
- Grant, A.M., Gino, F. and Hofmann, D.A. (2011), "Reversing the extraverted leadership advantage: the role of employee proactivity", *Academy of Management Journal*, Vol. 54 No. 3, pp. 528-550.



- Hakan, K.O.C., Kiliçlar, A. and Yazicioglu, I. (2013), "The analyzing leadership styles of Turkish managers in the scope of the Blake and Mouton's managerial grid", *International Journal of Business and Social Science*, Vol. 4 No. 11, pp. 96-109.
- Hassan, M.M., Bashir, S. and Abbas, S.M. (2017), "The impact of project managers' personality on project success in NGOs: the mediating role of transformational leadership", *Project Management Journal*, Vol. 48 No. 2, pp. 74-87.
- Hwang, B.G., Zhao, X. and Ong, S.Y. (2015), "Value management in Singaporean building projects: implementation status, critical success factors, and risk factors", *Journal of Management in Engineering*, Vol. 31, No. 6, doi: [10.1061/\(ASCE\)ME.1943-5479.0000342](https://doi.org/10.1061/(ASCE)ME.1943-5479.0000342).
- John, O.P. and Srivastava, S. (1999), "The Big Five trait taxonomy: history, measurement, and theoretical perspectives", in Pervin, L.A. and John, O.P. (Eds), *Handbook of Personality: Theory and Research*, 2nd ed., Guilford Press, New York, NY, pp. 102-138.
- Josanov-Vrgovic, I. and Pavlovic, N. (2014), "Relationship between the school principal leadership style and teachers' job satisfaction in Serbia", *Montenegrin Journal of Economics*, Vol. 10 No. 1, pp. 43-57.
- Judge, T.A., Bono, J.E., Ilies, R. and Gerhardt, M.W. (2002), "Personality and leadership: a qualitative and quantitative review", *Journal of Applied Psychology*, Vol. 87 No. 4, pp. 765-780.
- Khan, M.L., Langove, N., Shah, F.A. and Javid, M.U. (2015), "The modes of conflicts and managerial leadership styles of managers", *Global Business and Management Research*, Vol. 7 No. 2, pp. 44-52.
- Kumaraswamy, M.M., Anvuur, A.M. and Smyth, H.J. (2010), "Pursuing relational integration and overall value through "RIVANS"", *Facilities*, Vol. 28 Nos 13/14, pp. 673-686.
- Madter, N., Bower, D.A. and Aritua, B. (2012), "Projects and personalities: a framework for individualising project management career development in the construction industry", *International Journal of Project Management*, Vol. 30 No. 3, pp. 273-281.
- Marcus, B., Ashton, M.C. and Lee, K. (2013), "A note on the incremental validity of integrity tests beyond standard personality inventories for the criterion of counterproductive behaviour", *Canadian Journal of Administrative Sciences - Revue Canadienne des Sciences de l'Administration*, Vol. 30 No. 1, pp. 18-25.
- Marinova, S.V., Moon, H. and Kamdar, D. (2012), "Getting ahead or getting along? The two-facet conceptualization of conscientiousness and leadership emergence", *Organisation Science*, Vol. 24 No. 4, pp. 1257-1276.
- Matthews, G., Deary, I.J. and Whiteman, M.C. (2003), *Personality Traits*, Cambridge University Press, Cambridge.
- McCabe, K.O. and Fleeson, W. (2012), "What is extraversion for? Integrating trait and motivational perspectives and identifying the purpose of extraversion", *Psychological Science*, Vol. 23 No. 12, pp. 1498-1505.
- McCrae, R.R. and Terracciano, A. (2005), "Universal features of personality traits from the observer's perspective: data from 50 cultures", *Journal of Personality and Social Psychology*, Vol. 88 No. 3, pp. 547-561.
- McIntyre, L. (2011), *The Practical Skeptic: Core Concepts in Sociology*, McGraw-Hill, New York, NY.
- Moutafi, J., Furnham, A. and Crump, J. (2007), "Is managerial level related to personality?", *British Journal of Management*, Vol. 18 No. 3, pp. 272-280.
- Nelson, B. and Rawlings, D. (2010), "Relating schizotypy and personality to the phenomenology of creativity", *Schizophrenia Bulletin*, Vol. 36 No. 2, pp. 388-399.
- Newstrom, J.W. and Davis, K. (1993), *Organisational Behavior: Human Behavior at Work*, McGraw-Hill, New York.
- Ng, T.W.H. and Feldman, D.C. (2008), "The relationship of age to ten dimensions of job performance", *Journal of Applied Psychology*, Vol. 93 No. 2, pp. 392-423.
- Nunnally, J.C. (1978), *Psychometric Theory*, 2nd ed., McGraw-Hill, New York.



- Polek, E., Van Oudenhoven, J.P. and Berge, J.M.F.T. (2011), "Evidence for a "migrant personality": attachment styles of poles in Poland and Polish immigrants in The Netherlands", *Journal of Immigrant and Refugee Studies*, Vol. 9 No. 4, pp. 311-326.
- Roberts, B.W., Caspi, A. and Moffitt, T.E. (2001), "The kids are alright: growth and stability in personality development from adolescence to adulthood", *Journal of Personality and Social Psychology*, Vol. 81 No. 4, pp. 670-683.
- Roberts, B.W., Caspi, A. and Moffitt, T.E. (2003), "Work experiences and personality development in young adulthood", *Journal of Personality and Social Psychology*, Vol. 84 No. 3, pp. 582-593.
- Rolland, J.-P. (2002), *The Five-Factor Model of Personality Across Cultures*, Kluwer Academic / Plenum Publishers, Amsterdam, pp. 7-28.
- Ronald, B. (2014), "Comprehensive leadership review-literature, theories and research", *Advances in Management*, Vol. 7 No. 5, p. 52.
- Saadé, R.G., Dong, H. and Wan, H. (2015), "Factors of project manager success", *Interdisciplinary Journal of Information, Knowledge, and Management*, Vol. 10, pp. 63-80, available at: <http://www.ijikm.org/Volume10/IJIKMv10p063-080Saade1721.pdf>.
- Senaratne, S. and Samaraweera, A. (2015), "Construction project leadership across the team development process", *Built Environment Project and Asset Management*, Vol. 5 No. 1, pp. 69-88.
- Yang, L.R., Huang, C.F. and Wu, K.S. (2011), "The association among project manager's leadership style, teamwork and project success", *International Journal of Project Management*, Vol. 29 No. 3, pp. 258-267.
- Zopiatis, A. and Constanti, P. (2012), "Extraversion, openness and conscientiousness: the route to transformational leadership in the hotel industry", *The Leadership and Organization Development Journal*, Vol. 33 No. 1, pp. 86-104.

**Corresponding author**

Florence Y.Y. Ling can be contacted at: [bdglyy@nus.edu.sg](mailto:bdglyy@nus.edu.sg)

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

[www.emeraldgroupublishing.com/licensing/reprints.htm](http://www.emeraldgroupublishing.com/licensing/reprints.htm)

Or contact us for further details: [permissions@emeraldinsight.com](mailto:permissions@emeraldinsight.com)

Reproduced with permission of copyright owner. Further reproduction prohibited without permission.