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Managerial competencies of female and male managers in the Swedish construction industry

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The construction industry is one of the most male dominated industries around the world, not only when it comes to workers, but also as regards managers. Only 5% of the managers in the Swedish construction industry are women. The managerial competencies of individuals working as managers in the Swedish construction industry are researched to get a clearer understanding of the situation, and to investigate if this lack of balance between male and female managers has to do with differences in managerial competence. The management development questionnaire provided by Human Resource Development Press was sent to 143 managers in the Swedish construction industry and 112 respondents (44 women and 68 men) assessed themselves in 20 competencies, resulting in a response rate of 78%. The Mann-Whitney U test showed that female and male managers possess equal managerial competencies in 17 of the 20 competencies. Male managers rated themselves as having better managerial competency than females in two of the 20 competencies, namely 'resilience' and 'decision making'. Female managers rated themselves as having better managerial competency than males in 'sensitivity', which follows the social norm of what is expected of a woman. It was also found that both groups scored high in decision making, reflecting traditional virtues of construction managers as decisive and active. The most important result is not the differences but the many similarities between women and men working as managers in the construction industry. Thus, it is concluded that female managers are as competent as male managers in the Swedish construction industry.

Keywords: Management, managerial competence, survey, Sweden, women.

Introduction

The construction industry has always been and still is one of the most male dominated industries, not only in most parts of the world (Dainty and Lingard, 2006; Menches and Abraham, 2007; Loosemore and Galea, 2008; Worall *et al.* 2010), but also in Sweden. According to Statistics Sweden, the number of female employees in the Swedish construction industry was 8% in 2011. Among civil engineers and architects, the situation was better, as around 27% of this population were female. However, if managers in specialist positions are excluded, the number of female managers constituted only 5% of the managers in the Swedish construction industry (Table 1). One can clearly see

that the proportion of female managers in the construction industry is much lower than the proportion of female managers in the whole working population in Sweden (33%) (Statistics Sweden, 2013). Overall, these numbers show that women are underrepresented in the construction industry and that very few women hold managerial positions.

Several reasons are cited in the literature about why mostly men enter the industry and hold occupations in it. Studies based on women's and men's experiences working in the industry point to barriers such as poor working conditions and environment, inflexible working structures, long working hours, lack of balance between work and family life, discrimination against women, a tough jargon used, and a negative

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Table 1 Employment in the Swedish construction industry in 2011 (percentages) (Statistics Sweden, 2013)

Occupation	Men	Women
Executives	96.1	3.9
Managers SMEs, smaller units	95.5	4.5
Operation managers	92.1	7.9
Managers specialist units	68.7	31.6
Architects, civil engineers	73.0	27.0
Technicians	91.5	8.5
Administrators	39.9	60.1
Craft workers, machine drivers	98.7	1.3
Total employed	94.6	5.4

public view of the industry (Olofsson, 2000; Dainty and Lingard, 2006; Cettner, 2008; Styhre, 2011). There are examples in many countries of how women working in the construction industry are forced to either assimilate and conform to the existing masculine culture or become marginalized, discouraged, and possibly ejected from the industry (e.g. Loosemore and Galea, 2008; Powell *et al.*, 2009; Watts, 2009; Kyriakidou, 2012). Agapiou (2002) studied men's and women's attitudes towards women in the industry and found that women's role was constantly negotiated both among men and among women. A way for women to integrate themselves into the workplace was to be very good at their work. Indeed, researchers such as Agapiou (2002), Cettner (2008), and Faulkner (2007) found that many women perceive that they have to work harder than men to be recognized as competent and that they struggle with finding an identity within the masculine ideology of norms, beliefs, and assumptions that prevail within the industry. It is observed in the research literature (e.g. Agapiou, 2002; Bagilhole *et al.*, 2002; Fowler and Wilson, 2004; Gherardi and Poggio, 2007; Friberg and Serneberg, 2008) and in informal conversations with construction professionals that a widespread belief exists within the construction industry that women are less competent than men in this field, not only as craft workers but more so as managers. However, perceptions of women being less competent seem to be based on folklore, fears, and fallacy (Agapiou, 2002). It is therefore desirable to scrutinize this belief and compare the managerial competency of women and men working as managers in the construction industry.

The objective of the research is to investigate the competencies of men and women holding managerial positions in the Swedish construction industry. Comparing male and female managers' competencies is expected to show whether there is reason to perceive men as more competent than women in this field and

whether it is justified that men hold more managerial positions than women in the construction industry. Since the Swedish construction industry is facing a large number of retirements in the coming years, it is of importance to have access to a wide selection of professional managers when filling managerial positions. It may be beneficial to replace the retiring professionals not only by competent men, but also by competent women.

The importance of managerial competency is explained as background for the study. This is followed by a literature review of the past and present situation of women working in the Swedish construction industry set in a global context of international studies. Thereafter a brief overview of what is currently being done to recruit and keep women in the Swedish construction industry is presented. After a description of the data collection procedures and the statistical calculations performed, the results are discussed to ascertain the possible differences and similarities between male and female managers' competencies as well as relating the results to theory. The paper ends by presenting possible biases of the methodological approach taken and implications for the construction industry as well as for future research.

Managerial competency

Boyatzis (1982) defines competency as 'the underlying characteristic of the person that leads to or cause effective and superior performance'. Dubois' (2002) definition is more detailed:

Competency is any characteristic or trait that an individual uses for successful or exemplary performance of any type. These 'performance tools' include an individual's knowledge, skills, thought patterns, mindsets, social roles, and aspects of self-esteem or self-efficacy. A characteristic or trait is a competency only when its use can be proven to be necessary for successful performance of some type.

According to Cameron (1997b), management means working and developing with people; it means taking responsibility, communicating clearly, keeping promises, and knowing oneself; it requires the ability to delegate authority and make subordinates feel powerful and creative; it involves courage and tenacity and being a quick learner. Competencies involve behaviours that contribute to successful management and, ultimately, contribute to business performance. It is clear from these definitions that competencies can be considered to be key elements that allow individuals to achieve their goals, to develop themselves, and improve their performance.

Competencies may be used for assessment purposes. Hiring and firing decisions are often based on an assessment of the candidates' competencies. Dubois (2002) lists some of the reasons why competencies are important:

- The performance bar can be raised by determining the competencies of performers. Enhancing the competencies of the performers will let them achieve higher performance.
- Competencies focus on individual achievement rather than the traditional approach that focuses on successful completion of work.
- Virtually nothing of value can be achieved without competencies tied to organizations.

According to Rowe (1995), competency defines the level of a performer by comparison. Gender-related comparisons can be made using competency assessments.

Women in the Swedish construction industry

There is evidence showing that women worked in the construction industry in Sweden as early as year 1661 (Olofsson, 2002). They worked as helpers to masons, which was physically one of the toughest jobs in the industry. In the early twentieth century, a bonus system was introduced in Sweden that was based on the time it would take to complete a project. At that time, women were no longer wanted in the construction industry since most of them were not as physically strong as men and therefore, could not work as fast. It took until the 1970s for women to once again enter the industry. This time they no longer worked as helpers to the men, but were employed as skilled workers (Olofsson, 2002). There has not been a major change since the 1970s; women still represent a very small percentage of the employees in the Swedish construction industry. Data based on employment statistics of 2011 show that 27% of civil engineers and architects, 8% of technicians, 1% of craft workers, and only 5% of managers are women (Table 1). These figures are not unique to Sweden; the low percentages of women working in the construction industry and in particular, the low percentages of female managers are also prevalent in the UK (Fielden *et al.*, 2000; Worall *et al.*, 2010), the US (Menches and Abraham, 2007), Australia (Loosemore and Galea, 2008), Denmark (Kamp, 2005), and Greece (Kyriakidou, 2012). Clearly, the presence of women in the industry is very low and few manage to get roles as managers and higher executives in

the business (Dainty *et al.*, 2004; Watts, 2009; Kyriakidou, 2012).

There are several factors that affect the number of women in the Swedish construction industry. A survey was performed in 2010 by the Swedish Association of Construction Managers (Byggcheferna), where 169 female and 224 male construction managers participated. It was found that according to 47% of the females, the foul language used particularly on construction sites was considered as a major reason why there are few females in the construction industry; 49% of the females complained of a bad attitude towards women on construction sites; and 36% of the 224 male managers agreed with the females' opinion (Axelsson, 2010). In the same survey, it was reported that 17% of the respondents knew female colleagues who quit their job because of degrading treatment from men, and 36% reported that they had been discriminated against because of their gender.

Cettner (2008) researched women's experiences as civil engineers in the construction industry by performing in-depth interviews with 11 women who stated that they had been dealing with issues such as a discrimination, alienation, and resistance from men in the industry to let women into the 'inner circle'. Other issues mentioned by the females in Cettner's (2008) study included the long work hours in the industry, the foul language used, sexual harassment, the fact that women have to prove themselves to be exceptional at what they do to be accepted, and the fact that women are not let into the networks in the same way as men. Similar results are found in other countries. Focusing on male and female construction workers' perception of women's role in construction, Agapiou (2002, p. 704) reports a working environment where women's place in the Scottish construction industry is constantly negotiated and questioned, where women have to learn how to 'take a joke' and to be accepted means tuning in with the male culture, an environment where women have to confront construction workers' prejudices about women being unsuitable for some tasks. Gherardi and Poggio (2007) recount women's stories about how they are different from men but also from women, and how they are faced with various challenges making them 'tilting at windmills like Don Quixote' fighting for rights they already have, just to survive in a 'men-only' workplace (p. 68). Although it may be an extreme example, Bagilhole *et al.*'s (2002) account of one woman's experiences in her first 12 weeks as a quantity surveyor on site presents a horrible story of how a woman is broken down to a point where she states that the industry is a place where '... men want to keep it a man's world' (p. 425), thus a place where women are not welcome. Moreover, in a study of

occupational stress among Australian architects, female architects reported poorer health/well-being and lower job satisfaction than their male peers (Sang *et al.*, 2009). Although Sang *et al.*'s (2009) study does not explain why this is so, the authors speculate that it can be because of women's subordinated position within both the industry and the profession.

The virtue of overworking relative to the work-life balance was also put forward in Styhre's (2011) study of site managers in Sweden as a key aspect blocking a more modern view of site management and leadership within the industry. Styhre (2011) concluded that owing to the masculine rationalities within the industry, favouring 'devotion to work', 'omnipresence', and 'crisis management', it is not only 'glass ceilings', i.e., upward career movements, that hinder women from becoming managers, but also 'glass walls', i.e., unwillingness to introduce women into specific professional communities. One of the issues discussed by Cettner (2007) was also investigated by Jansson and Åkerlund (2011) who conducted a study of what prevents females in the construction industry from reaching managerial positions. By performing in-depth interviews with four women, Jansson and Åkerlund (2011) concluded that one reason why few women hold managerial positions is that women give higher priority to their family life and also domestic responsibilities than men, and that they simply do not have enough time to hold managerial positions. This reason has also been mentioned by women interviewed in several other studies, leading to the conclusion that the masculine management work culture in the construction industry in many regards is incompatible with family life (Dainty and Lingard, 2006; Watts, 2009; Styhre, 2011). In addition, it is also found that compared to men, women with a college degree tend to work in supporting functions locking them out from leading positions in companies (Fielden *et al.*, 2000; Olofsson, 2002; Lingard and Francis, 2004). A comparative study of men's and women's perceptions about the limited number of female higher executives in Sweden also showed that women's reluctance to apply for higher positions was primarily a preconception of men, whereas not participating in informal networks and not having prioritized goals were perceived by women to be the main reasons for only few women occupying higher executive positions (Göransson, 2004). Thus, the idea of women lacking career commitment seems to be a stereotyped assumption.

The literature review indicates that women, like in other countries, are underrepresented in the Swedish construction industry and that there are many reasons why the construction industry lacks female employees and managers. At any rate, the construction industry

in Sweden appears to be aware of the situation, and is trying to rectify this lopsided distribution. The following section describes attempts made to hire and retain more women in the Swedish construction industry.

What is being done to recruit more women in the Swedish construction industry?

Many construction companies in Sweden, especially larger companies, are willing to hire women to both managerial positions as well as other jobs. In the two largest construction companies in Sweden, the number of female employees is however still relatively small. For example, according to Skanska's and the Nordic Construction Company's (NCC) annual reports from 2011 (Nordic Construction Company, 2012; Skanska, 2012) the percentage of female managers is 14% in Skanska and 18% in NCC. Both Skanska and NCC have however set a goal of recruiting the same percentage of women as are graduating from the civil engineering programmes in the country, which is approximately 35%. In 2006, Skanska took it a step further by not only setting the goal of hiring 35% women, but also connecting the percentage of hired women to an already established bonus system (Nohrstedt, 2008). If the higher executives in the company failed in hiring at least 35% women, there would be a reduction in the yearly bonus they normally receive. In 2006, Skanska exceeded the goal and recruited 40% females (Nohrstedt, 2008). Although the recruitment system was disconnected from the bonus system as early as 2007, the culture of hiring women seems to have become an established practice, and in 2011 more than 45% of the newly recruited were women (Skanska, 2012). However, recruiting is one thing, keeping women in the industry is another. Based on their study of women's career under-achievement in UK construction companies, Dainty *et al.* (2000) show that women could progress in parity with men if they had an unbroken career pattern of 12–13 years, but also that few women were willing to make the sacrifices needed to overcome the fundamental barriers caused by the overly male-oriented culture. They even suggest that women should not be attracted to the industry unless steps are taken to change this culture.

By founding a female network in 2002 with the main goals of reducing discrimination against women, as well as dealing with the tough jargon used on construction sites, the construction union in Sweden made an attempt to encourage more women both to enter the industry and to stay in it (Swedish Construction Union, 2010). Emulating the construction union, a large Swedish construction company,

Peab, established a female network called eBBA (Lilja, 2008). Similarly, the Nordic Construction Company created a network for women. Their network is called Stella and was founded 14 years ago (Nordic Construction Company, 2010). There are also independent networks such as 'Byggare Berit [Berit the Builder]', 'Kvinnors byggforum [Women's Forum for Construction]', and 'Project Libra', a transnational project operating across the European Union (Libra, 2008), that are trying to enhance the opportunities for females in the construction industry as well as trying to create a forum where females can share experiences and therefore grow stronger in construction-related positions.

Studies in the UK show that although equal opportunity is embedded in corporate recruitment strategy, women are still unable to rise to top management posts (Watts, 2009). Similarly, even though efforts are made in Sweden to increase the number of women in the construction industry, the Swedish construction industry is still dominated by men to this day (Table 1). A combination of reasons mentioned earlier may have caused this skewed distribution in the manager population, but is managerial competency one of these reasons? A recent study on project managers in the US construction industry showed that female managers did not differ much from their male peers (Arditi and Balci, 2009). None of the previous research undertaken in Sweden has compared the managerial competency of women and men in the construction industry. It is now time to see if female managers are more or less competent than male managers in the Swedish construction industry.

Methodology of the study

McClelland (1973) is generally considered to be the first researcher to suggest that competencies should be assessed on the basis of clusters of life outcomes including not only occupational outcomes but social ones as well, such as leadership and interpersonal skills, instead of only general intelligence or aptitude tests, or tests based on criterion sampling, which have the danger of being too specific. This school of thought led to the development of different assessment tools by researchers in the US and in the UK. The US approach is mostly behaviour-based, and aims to identify what kinds of competencies underlie successful performance, whereas the UK approach is mostly skill-based and function-based, and aims to determine which skills are satisfactorily performed (what people can do), and which behaviours are adopted in competent performance (how people do

it). Examples of managerial competency assessment include Boyatzis' (1982) and Schroder's (1989) models in the US, and the MCI Personal Competence Model (Thompson and Harrison, 2000) in the UK.

Boyatzis (1982) states that a competency assessment model should consider the 'type' and 'level' of the competency measured. Different 'types' of competencies are various aspects of human behaviour and capabilities to perform these behaviours. The 'level' of competency refers to the fact that each type of competency might exist to various extents within people. The 'level' of competency can be viewed as how frequently a person applies competencies in their work. Therefore, the level of competency can be dependent on the person and the environment. Boyatzis' competency model, which is the best-known US model, contains competencies that are required for satisfactory job performance within the context of a person's job roles, responsibilities and relationships in an organization, and its internal and external environments.

Another competency-based approach developed in the US is Schroder's (1989) High Performance Model. Schroder (1989) considered three different competency bases, namely entry level, basic, and high performance competencies. Schroder's (1989) model is composed of 11 competencies with four main clusters (i.e. cognitive, motivating, directing, and achieving). Schroder (1989) focuses more on group performance. He states that managers do not have to have all the competencies to achieve the best performance; however a group or team should reflect high performance in almost all competencies.

A well-known UK model is the MCI Personal Competence Model published by the Management Charter Initiative (MCI) (Thompson and Harrison, 2000). This model defines behaviours noted in competent managers (Further Education Unit, 1993). The competencies are intended to apply to all managers and supervisors and are not designed to be assessed separately (Further Education Unit, 1993). The Competence Model of MCI has four clusters of competencies (i.e. planning, managing others, managing oneself, and using intellect).

According to Le Deist and Winterton (2005), behavioural competencies are increasingly being added to the function-based competency models in the UK, while functional competencies are being added to the behaviour-based competency models in the US. A holistic framework that considers knowledge, skills, functions, and behaviours as dimensions of competency is adopted by the management development questionnaire (MDQ) provided by HRD Press, Inc. (Cameron, 1997a, 1997b). The MDQ is a personal assessment tool that is designed to assess competencies of individuals holding managerial

positions (Cameron, 1997a). Balci (2008) evaluated the assessment tools developed by Boyatzis (1982) and Schroder (1989) in the US and the MCI personal competence model (Thompson and Harrison, 2000) developed in the UK, before concluding that the MDQ is the most suitable tool since all competence dimensions identified in other models as key predictors of successful performance are represented in the MDQ model. The MDQ was first used as a survey tool by Arditi and Balci (2009) to study managerial competencies in the US construction industry.

Methods used in the study

A survey was conducted to investigate the veracity of the previously described belief that women in the construction industry are less competent in management skills than men. The survey tool used to investigate the behavioural competencies of female and male managers in the Swedish construction industry was the management development questionnaire (MDQ). The MDQ was administered to 143 managers. The results of the completed surveys were analysed and discussed by means of statistical techniques. The MDQ consists of 160 statements that assess an individual's managerial behaviour across 20 different key competencies, each of which consists of eight statements. The 20 key competencies are grouped into five global competencies: 'managing change', 'planning and organizing', 'interpersonal skills', 'results orientation', and 'leadership' (Cameron, 1997b). The 20 key competencies and the five global competencies are shown in Table 2. The test taker can respond to each statement by choosing one of five options: 'strongly agree', 'agree', 'neutral', 'disagree', or 'strongly disagree'. The 'agree-disagree scale' is then converted to a numerical scale where each answer is worth between one and five points. All statements have either positive or negative implications; therefore 'strongly agree' is worth five points for a positive implication and only one point for a negative implication. The statement 'I am prepared to do whatever it takes' in the 'initiative' competency has a positive implication: answering 'strongly agree' shows that the individual gets things done and acts independently, which are good qualities in a manager. 'Strongly agree' will therefore result in five points in this case. The statement 'I like to follow others rather than lead' is another statement from the same competency, but this one has a negative implication: answering 'strongly agree' will result in only one point since it indicates that the person does not act on his or her own and misses business opportunities. Thus, competencies with high scores represent an

Table 2 Global and key competencies (Cameron, 1997b)

Global competency	Key competency	Cronbach's alpha
Managing change	Initiative	0.74
	Risk taking	0.73
	Innovation	0.80
	Flexibility/ Adaptability	0.35
Planning and organizing	Analytical thinking	0.74
	Decision making	0.74
	Planning	0.77
Interpersonal skills	Quality focus	0.67
	Oral communication	0.88
	Sensitivity	0.79
	Relationships	0.70
Results orientation	Teamwork	0.70
	Achievement	0.71
	Customer focus	0.53
	Business awareness	0.67
Leadership	Learning orientation	0.71
	Authority/Presence	0.83
	Motivating others	0.23
	Developing people	0.79
	Resilience	0.74

individual's strengths and competencies with low scores represent an individual's weaknesses.

Before using a tool for research purposes, one should ensure that it is reliable and valid. Reliability means the extent to which a measuring procedure yields the same result on repeated trials. Validity is the degree to which a test procedure accurately measures what it was designed to measure.

Cronbach's alpha was used to measure the reliability of the MDQ by its developers (Cameron, 1997a). The Cronbach's alpha coefficient measures internal consistency, i.e. how closely related a set of items is as a group. The Cronbach's alpha coefficient for each key competency is displayed in Table 2. If the Cronbach's alpha coefficient for a factor is higher than 0.60, the factor is said to be reliable for exploratory studies (Hair *et al.*, 1998). As can be seen in Table 2, 17 of the 20 competencies have a Cronbach's alpha higher than 0.60. Three competencies: 'flexibility/adaptability', 'customer focus', and 'motivating others' have a Cronbach's alpha lower than 0.6. However, the mean value of the Cronbach's alpha for the 20 competencies is

0.69, which means that, overall, the MDQ is reliable and is expected to yield the same test results on repeated trials (Cameron, 1997a).

When testing validity, exploratory factor analysis is often used. Exploratory factor analysis identifies the underlying factor structure of a set of variables (Suhr, 2006). By using this method, the developers of the MDQ investigated whether the 20 key competencies of the MDQ measured what they were designed to measure. According to the exploratory factor analysis performed by the creators of the test, 18 of the 20 competencies have an 'eigenvalue' that is greater than one, meaning these competencies measure what they are designed to measure. Therefore the MDQ is considered validated (Cameron, 1997a).

Data collection

Member companies of the Centre for Management of the Built Environment in Sweden were contacted. The Centre for Management of the Built Environment is an association that among other things is dedicated to support management research and education in the construction industry. It has 43 company members of many sizes and types, including large construction companies that employ several thousand employees, as well as smaller consultancies.

The names and e-mail addresses of a total of 143 of managers were identified in the 43 member companies and the survey was sent to them in 'Google Forms'. The respondents, with architecture/engineering/construction background, were asked to mark their gender (man or woman) and thereafter respond to the 160 statements that make up the MDQ. All respondents remained anonymous when responding to the survey. The link to the survey was shut down on 15 July 2011, by which time 112 responses had been received from the 143 individuals the link was sent to, resulting in a response rate of 78%. Out of the 112 respondents, 44 were female and 68 male.

Calculations and score conversions

A respondent could receive a total score between 8 and 40 in each key competency. These scores were tallied up separately for each respondent, meaning each respondent received 20 different scores, one in each competency. This means a total of 2240 different scores were calculated for the 112 respondents. Next, the scores were converted into a Standard Ten (STEN) scale, where each respondent could obtain a score between 1 and 10. The STEN scale is not linear, which means that the same score in two differ-

ent competencies will not necessarily generate the same STEN score in those two competencies. For example, a respondent who received 25 points in the competency 'developing people' gets a STEN score of one, while a respondent receiving 25 points in the competency 'risk taking' obtains a STEN score of 5. The STEN scores were calibrated by Human Resource Development (HRD) Press for each and every competency separately (Cameron, 1997a) and are not presented here in order to protect the proprietary rights of HRD Press, Inc. Once the STEN scores for each respondent were found, the mean value of the STEN scores for each competency was calculated separately for the female and male managers.

A high STEN score represents a person's strengths, while a low STEN score represents an individual's weaknesses. A STEN score between 1 and 3 represents poor performance in that competency, between 4 and 7 average performance, and between 8 and 10 high performance.

Results and analysis

STEN scores

The 68 men and 44 women participating in the study were assessed in 20 different competencies (see Table 2) and each received a STEN score, ranging from 1 to 10, in each competency. The STEN scores were calculated separately for each individual respondent and then the means for men and for women were calculated. The mean STEN scores for each of the 20 competencies are shown in Table 3. As can be seen in the table, the male managers had a higher mean STEN score than the female managers in 11 competencies and the female managers had a higher mean STEN score than the male managers in nine competencies.

Next, the differences in STEN scores between the female and male managers were tested to determine whether the differences are statistically significant. First, the skewness was calculated for each competency for both men and women. Skewness is the degree to which a statistical distribution is not in balance around the mean. If the distribution is perfectly symmetrical, the skewness of the distribution is zero. Positive skew indicates that the distribution's extreme values are above the mean and negative skew indicates that the distribution's extreme values are below the mean. As can be seen in Table 3, the skewness for all competencies for both men and women shows that the data are not normally distributed. Therefore, a non-parametric test was used when assessing whether the differences in STEN scores between female and male managers are statistically significant.

Table 3 Results of statistical analyses

Competency	Skewness		STEN score		P-value
	Men	Women	Men	Women	
Initiative	-0.051	-0.282	6.147	6.023	0.799
Risk taking	0.382	0.716	4.015	3.705	0.331
Innovation	0.141	-0.023	4.985	5.341	0.289
Flexibility/Adaptability	0.055	0.254	3.647	4.045	0.314
Analytical thinking	-0.185	-0.006	5.162	4.523	0.051
Decision making	-0.450	-0.127	7.029	5.705	0.004*
Planning	0.282	0.245	4.412	4.136	0.384
Quality focus	0.216	0.230	4.471	4.091	0.259
Oral communication	-0.915	-0.542	6.338	5.795	0.105
Sensitivity	0.227	-0.645	4.647	6.205	0.000*
Relationships	-1.143	-0.748	5.838	6.523	0.074
Teamwork	0.006	-0.535	5.353	6.432	0.008
Achievement	0.363	-0.766	5.456	5.205	0.961
Customer focus	-0.079	-0.027	4.515	4.886	0.353
Business awareness	0.367	-0.460	6.353	5.750	0.357
Learning orientation	-0.208	0.047	4.485	5.091	0.190
Authority/Presence	-0.611	-0.388	6.529	5.932	0.053
Motivating others	0.204	0.112	5.897	5.932	0.976
Developing people	0.103	0.141	5.029	5.182	0.745
Resilience	-0.068	0.481	5.309	3.409	0.000*

Note: * Statistically significant difference at $\alpha = 0.05$.

The Mann-Whitney U test is a non-parametric test that is commonly used to determine if the means of two groups are different from each other. The Mann-Whitney U test was selected given that the data were independently collected from the respondents, and that the only dependent variable is ordinal. A two-tailed Mann-Whitney U test was performed. The null hypothesis states that the STEN scores for the female and male managers are equal, meaning men and women are as competent when it comes to managerial competency.

The p-values shown in Table 3 estimate the probability that the null hypothesis is rejected for each competency at a significance level of $\alpha = 0.05$. If the p-value of a competency is less than 0.05, the null hypothesis is rejected. In other words, if the p-value is less than 0.05, it means that female and male managers differ in terms of managerial competency.

Even though the male managers received a higher STEN score in 11 competencies and the female managers received a higher STEN score in nine competencies, only in a total of three competencies are the differences in STEN scores between the genders statistically significant, having a p-value less than 0.05 (see Table 3). For the remaining 17 competencies, there is no statistically significant difference, meaning that male and female profession-

als' managerial performance in these 17 competencies can be considered to be equal to each other. The male managers had a higher STEN score than the female managers in two competencies where the differences were proven to be statistically significant, namely 'decision making' and 'resilience', while the female managers had a higher STEN score in only one competency where the difference was proven to be statistically significant, namely 'sensitivity'.

Discussion

The Mann-Whitney U test shows that male managers in the Swedish construction industry display higher competency in 'decision making' than female managers (see Table 3). In this competency, men received a STEN score of 7.029, the highest STEN score obtained in all competencies. Female managers also scored relatively high in this competency. Individuals with a high score in 'decision making' make decisions quickly, display confidence, take responsibility for the outcomes, and act independently when necessary (Cameron, 1997b), all virtues that are perceived to be important for managers in the construction industry (Styhre, 2011). The Mann-Whitney U test also showed that male managers have higher competency

in 'resilience' (see Table 3). The behavioural description of persons scoring high in this competency is that they can handle pressure and stress, and stay calm and in control (Cameron, 1997b). Female managers scored low in this competency, which indicates that they worry about things, have a tendency to take things too seriously, are anxious to please others, find it hard to stay in control, perform poorly under stress, and are generally seen as anxious and worrying (Cameron, 1997b). This result may be a reflection of the undue pressure put on women by a masculine work culture, creating occupational stress and making them both unhealthy and under-achievers when it comes to career development (Dainty *et al.*, 2000; Sang *et al.*, 2007).

There was one competency where female managers scored statistically higher than male managers, namely 'sensitivity' (see Table 3). The higher STEN scores of female managers show that they outperform male managers in this competency, meaning they are better than men at listening to people's views and ideas, responding to people's problems, and tolerating poor performance (Cameron, 1997b). This result aligns with the cultural stereotype in western societies where assertiveness and insistent communication styles are associated with 'strength', 'power', and 'masculinity' and where 'tactfulness' and 'sensitivity' are associated with femininity (Loosemore and Galea, 2008).

As stated earlier, the developers of the MDQ categorized STEN scores into poor performance (1–3 points), average performance (4–7 points), and high performance (8–10 points). Male managers' STEN scores are in the 4–7 points range, meaning their performance is categorized as 'average', in 18 of the 20 competencies. In one competency, 'decision making', as discussed earlier, the men score high. However, in 'flexibility/adaptability' they only score 3.647 points, meaning their performance in this competency is rated 'poor'. Female managers also score low in this competence. A low score in this competence indicates that the professional defends his or her own position, gets his or her own way, is perceived as tough and uncompromising, is unwilling to give a little, gets into confrontations, and is seen as obstructive and inflexible (Cameron, 1997b). Again, all these 'qualities' have been perpetuated as part of the masculine management repertoire of the autocratic construction manager, which has nurtured a conflict-ridden blame culture within the industry (Watts, 2009).

When it comes to the female managers, they also perform within the average range (4–7 points) in 18 of the 20 competencies. Earlier, it was discussed how and why female managers displayed 'poor' performance in 'resilience'. The females', but also the males' manage-

rial performance is rated 'poor' in one more competency, namely 'risk taking'. This indicates that managers try to reduce risk, follow rules and procedures, and are seen as reliable and consistent workers. It also indicates that he or she resists change, interprets rules rigidly, and is seen as a steady plodder (Cameron, 1997b). Besides the already mentioned 'decision making' competency, the competencies where both groups score in the higher range include 'oral communication', 'relationships', and 'authority/presence', indicating that these are important skills for a manager in the construction industry. However, in general, the results show that managers in the construction industry are rated relatively low in many of the competencies measured. Besides 'flexibility/adaptability' and 'risk taking', the respondents scored rather low in 'planning', 'quality focus', 'customer focus', 'innovation', 'analytical thinking', and 'learning orientation'. It is interesting to note that these weaknesses seem to be congruent with a general view of the Swedish construction industry that includes poor planning leading to cost overruns and delays, lack of quality and customer focus, poor innovation record associated with inability to learn from past mistakes, and inability to implement fast change (Josephson and Saukkoriipi, 2007; Venström and Eriksson, 2010; Håkansson and Ingemansson, 2013). Thus the managerial strengths seem to align with the dominating masculine ideology of the construction manager in itself (Styhre, 2011), while the weaknesses seem to relate to general structural problems of the whole construction industry.

Conclusions

Only 5% of managers are female in the Swedish construction industry. As in other parts of the world, women are thus clearly underrepresented. Research suggests that the reasons women choose not to enter or stay in the construction industry include the rough working conditions and environment, widespread discrimination against women, inflexible work structures, long working hours, lack of balance between work and family life, the tough language used, the poor public opinion about the industry, alienation, and sexual harassment. There is another factor that has not been thoroughly investigated in Sweden: the belief that women are less competent than men in this field (Agapiou, 2002; Bagilhole *et al.*, 2002; Fowler and Wilson, 2004; Gherardi and Poggio, 2007; Friberg and Serneberg, 2008), not only as craft workers but also as managers. The managerial competencies of men and women holding managerial positions in the Swedish construction industry were measured to investigate the veracity of this belief.

The results of the management development questionnaire (MDQ) administered to 143 managers employed by the 43 member companies of the Swedish Centre for Management of the Built Environment show that female and male managers possess equal competency in 17 of 20 competencies. The differences include male managers scoring statistically higher than female managers in 'decision making' and 'resilience', whereas female managers score statistically higher in 'sensitivity'. Men's performance was categorized as 'high' in 'decision making' and 'poor' in 'flexibility/adaptability'. In the remaining 18 competencies, men's performance was rated 'average'. Female managers' performance was rated 'average' in all competencies except for two, namely 'risk taking' and 'resilience', where it was rated 'poor'. This means that Swedish male managers consider themselves better at making decisions and dealing with stress and pressure, and female managers consider themselves better at dealing with people and listening to their needs, whereas men and women perform equally well in all remaining competencies. It is interesting to note that the competencies where the respondents scored rather low reflect issues that the Swedish construction industry in general is known to struggle with, which of course may have influenced the respondents' perceptions of themselves as managers within this industry.

Three important factors have to be taken into account when considering the results. For one, this study is based on self-evaluations made by the participants. Secondly, this study shows that men perceive themselves to possess higher managerial competency than women when it comes to making decisions and being resilient, and women possess higher managerial competency in being sensitive. This outcome corresponds to gender expectations of society at large as evidenced in Clegg *et al.*'s (2009) work. Therefore, the responses of the participants may have been biased towards the common view of society. The third factor that should be taken into consideration is the fact that the MDQ is a personal assessment tool designed for managers in general, not for managers in the construction industry in particular; also, designed for individual manager assessment, not for surveying a large number of participants.

However, the most important result of this study is not the differences, but rather the many similarities between male and female managers' competencies. According to this study, female and male managers in the construction industry possess similar capabilities in 85% of the managerial competencies investigated. In conclusion, women and men appear to have mostly the same level of managerial competency, which means that the belief that women are less competent

than men in management positions in the Swedish construction industry can be rejected.

In Sweden, as in many other countries (e.g. Worall *et al.*, 2010; Ness, 2012), initiatives are under way to even the unbalanced distribution of men and women in the construction industry. However, research has suggested that overly focusing on women may be counterproductive, in the sense that it helps maintain gender segregation within the industry by stereotyping genders (Male *et al.*, 2009; Ness, 2012). Thus, in line with other researchers such as Dainty and Lingard (2006) and Ness (2012), and based on the results of this study that shows that male and female strengths and weaknesses in managerial competences are mostly alike, it can be stated that it is important to avoid the self-fulfilment of women's under-achievement (Dainty *et al.*, 2000), and it is suggested that future initiatives should avoid stereotyping and should focus on creating a work environment that allows diversity and equality for all.

Finally, it is important to acknowledge that the instrument used in the study, the MDQ, might be biased towards a more masculine workforce since female managers have been largely absent from management and organizational research, letting the male manager become the norm owing to men's numerical dominance as managers (Schein *et al.*, 1996; Bryans and Mavin, 2003). The congruence in the results may also imply that female managers may have assimilated the dominating masculine ideology of project management (Lindgren and Packendorff, 2006) and of the construction industry (Styhre, 2011).

The results of a comparative study of managerial competencies of male and female construction managers in different countries would be of interest in the current global environment. Companies that undertake international construction projects deserve to have a better understanding of the competencies of local managers in different countries. A comparative study of the situations in the US, Sweden, and France is under way. The inclusion of large developing economies such as China and India should be a priority in future research.

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