

THE EFFECT OF THE SITE ENVIRONMENT ON MOTIVATION AND DEMOTIVATION OF CONSTRUCTION PROFESSIONALS

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Research was undertaken to investigate motivation of white-collar construction employees, with particular regard to the effect of gender of the employee and of the site environment. Data was collected by a survey adapted from the Michigan Organisational Assessment Rating Technique. The survey was distributed amongst professionals with some site presence in Melbourne, Australia. Results indicate that professionals who are on site for five or more days per week have significantly higher levels of demotivation than professionals who are on site "part time" (ie. one to four days per week) and this result was linked to several identified factors, such as the presence "poor planning as a result of unfair resource distribution", "non recognition for work done", "colleagues' aggressive management style", "chaos/ad hocacy", and the importance of "long hours". It was also found that those people on site "full time" also have higher levels of motivation than those on site part time, although this result was not significant. The paper suggests a possible avenue for further research.

Keywords: demotivation, gender, motivation, satisfaction, workplace, site environment,.

INTRODUCTION

Research into motivation is commonly justified by the theoretical improvement in productivity that follows increased motivation. This is defined further by Oxley (1978), the Business Roundtable of New York (1982), Olomolaiye (1990) and by Baldry (1995).

Research undertaken in Melbourne, Australia, investigated the motivation levels of white-collar construction employees, particularly with regard to the possible effect of the construction site environment. The reason for paying particular attention to the construction site is the lack of research in this area, despite the suggestion that employees' motivation is affected by their environment (Robertson *et al.*, 1992) and that of the construction site being recognised as different to others (Olomolaiye and Price, 1989). The research further defined the respondents as male and female in an attempt to confirm either that men and women are motivated and demotivated by similar factors, or that women have higher levels of demotivation and this is the reason for the poor retention rate of women in the construction industry past the age of 30.

LITERATURE REVIEW

Research into motivation amongst construction industry employees seems to focus upon those where productivity is visible, ie. those in trade or blue-collar occupations. Much of the literature recommends variables which have been shown to be a positive influence on motivation. Olomolaiye and Price (1989) conclude that construction industry operatives may have the same needs as those in other industries, but since satisfaction of needs depends on the job environment, this warrants specific investigation and analysis.

Research into “white collar” construction employees is less extensive than that into operatives. Edwards and Eckbald (1984) suggest activities that should be implemented to achieve increased productivity, resulting from practice on a UK construction project. The authors recommend that the client take more responsibility for projects, and all parties should understand, share and be committed to project objectives. Chan (1993) conducted motivation research amongst Australian project managers, and concluded that generally project size had no bearing on motivation, but on the subject of salary he found that those with a higher income valued this more than those on a lower salary. Barrett (1993) asked professionals to indicate levels of “wants” and “gets” of the top three levels of Maslow’s hierarchy. Needs were calculated from the difference between wants and gets. Generally, extrinsic motivators (ie. those provided by the employer such as bonuses) were found to be much stronger than intrinsic motivators (those provided by the task such as self-esteem).

A review of the literature on the role of women in the construction industry reveals similar discussion points in the industries of the USA, the UK and Australia:

a change in the demographics of the labour market is predicted;

the proportion of female to male engineering undergraduates is lower than the proportion of female to male engineers;

engineering/construction does not appeal to young women as a career option, and retention of qualified female engineers is low.

Predicted changes in future demographic proportions of the labour market are often presented as the starting point of arguments for increasing the participation of women in construction. Both Gale (1991) and Greed (1990a,b,c) from the UK indicate a reduction in the total number of school leavers, accompanied by a change in the pattern of skills demanded by employers, and an increase in the skills of women (Moralee and Court, 1995). Boman (1996) recognises the shortage of industrial skills as occurring in Australia also. In America, Dorsey and Minkarah (1993) indicate that the same demographic changes are occurring.

The gender mix of engineering students is commonly used to show predictive trends for the industry. In Australia, female engineering students made up 4.9% of the engineering student population in 1984, and ten years later 13.1% (Squirchuk, 1996). The low progression and retention of female engineering students into senior positions in industry is found across the globe and is called the “pipeline effect” by Sinclair (1998). For example, Boman (1996) shows that although 13.1% of engineering students are female, only 4% of engineers are female.

The solution to increasing the proportion of women in industrial professions is discussed from two perspectives: attracting more women to the industry, and then

increasing the retention of them. Gale (1990) gives the following reasons for the unpopularity of the construction industry for females:

a greater proportion of males than females study subjects appropriate for the construction industry;

the word of mouth method commonly used to recruit may indirectly discriminate against women;

child care and the domestic commitments of a household do not mix easily with early starts and expected mobility.

The findings of Gale (1990) that young women perceive the industry to be male dominated, are substantiated by Pyke's (1993) findings from research in Australia.

It is widely acknowledged that women are leaving the industry during their 30's, sometimes after having children (CWSET, 1994). There are two questions to be discussed in relation to retention: why are female employees leaving, and what can be done to prevent this? Anderson *et al.* (1991) surveyed American construction trades women and professionals and found that they were predominantly satisfied at work. A common bond was the agreement that construction projects are intrinsically satisfying, and male respondents shared this. Dorsey and Minkarah (1993) agree with Gale (1990) in their findings that pride in the job, recognition, training, safety, inclusion in decisions, fair pay and consistent employment are equally important to male and female employees of the industry. Moralee and Court (1995) specifically identified factors that result in women leaving employment in construction in the UK:

they couldn't find work;

they wanted more security in employment;

there was a lack of training and development;

there were work/home interface difficulties;

they had a lack of satisfaction and status;

they wanted more family time, and

they would like a more supportive working environment.

More up to date research conducted by Lewis and Learmont (1996) shows female engineers in Australia raised authoritarian management styles as a potential additional factor.

METHODOLOGY

It has been pointed out by a number of investigators that motivation is a variable and dynamic emotion. Ideally, research into such a dynamic emotion would take place over a period of time to account for personal situations. James (1890) and Freud (1922) (from Olomolaiye, 1988) recognise that analysing the minds of individuals is an impossible task. Olomolaiye states that, given this fact, it is the norm in behavioural studies to infer and make judgements based on a respondent's actions or words.

A number of techniques have been used successfully for quantifying subjective human variables such as motivation. The Michigan Organisational Assessment Rating Technique (MOART) is one such survey that has been used by a number of investigators such as Olomolaiye (1988), and Maloney and McFillen (1986). The

MOART was adapted for this research. The resulting survey asks the respondents to rate each item in a catalogue of motivating factors, in terms of its importance to them and its presence. A similar catalogue was used to explore demotivating factors.

Each catalogue item is given a score out of 4 for importance and out of 3 for presence. A total score for each item is obtained by multiplying the importance and the presence of each catalogue item. As there are a number of motivating and demotivating items, a relative index can be calculated for each catalogue. Thus each respondent can be given a relative motivation index and a relative demotivation index. Comparison between individuals is now possible, even though some may have ignored different catalogue items.

Comparison between groups of individuals is possible through the use of the Relative Importance Index (RII) and Rank Agreement Factor (RAF). Once the catalogue items are ranked according to their RII, a RAF is calculated and presented in the format of a Percentage Disagreement (PD). This indicates the level of disagreement between subsets of the sample. The reader is referred to Chan and Kumaraswamy (1997) for a more detailed description of the Rank Agreement Factor and the Rank Importance Index.

130 surveys were distributed via Human Resource Managers and 45% (n = 58) were returned. This sample size is restrictive in statistical analysis terms; the number of catalogue items is large and the number of respondents relatively small. This excludes from the analysis such techniques as ANOVA which require division of the sample into small sets and assumes a normal distribution. Non-parametric techniques are in fact more appropriate for data of this nature; in particular the Kruskal-Wallis Test which is similar to the one-way between groups ANOVA. Whilst non-parametric techniques are acknowledged as less powerful than their parametric counterparts (Coakes and Steed, 1996), they are suitable where samples are small and also where data does not appear to be distributed normally (Norusis and SPSS, 1993).

KEY RESULTS

The research defined the critical analysis categories as “site environment” and “gender”. The results for gender categories of respondents were not found to be significant. Presentation of results will be limited to those found to be significant and therefore of interest in further research.

Site Time

In order to determine if the site environment had any affect on motivation, respondents were grouped according to whether they worked on site part time (1 – 4 days per week) or full time (5 or 6 days per week). Slightly more of the respondents were on site up to 4 days per week (54%, n = 31), whilst 46% (n=26) of the respondents were on site more than 4 days per week. Both motivation and demotivation decreased as site time increased. However the only statistically significant relationship was between demotivation levels and site time (p = 0.001). Hence the initial results concluded that increasing site time does lead to an increase in demotivation levels (see Figure 1).

Further analysis of the demotivating catalogue items indicate five were ranked significantly differently by respondents when grouped by time spent on site:

the presence of “non recognition for work done”,

the importance of “long hours”,
 the presence of “poor planning as a result of unfair resource distribution”,
 the presence of “chaos/ad hocacy”,
 the presence of “colleague’s aggressive management style”,
 These five items are the focus of the following discussion.

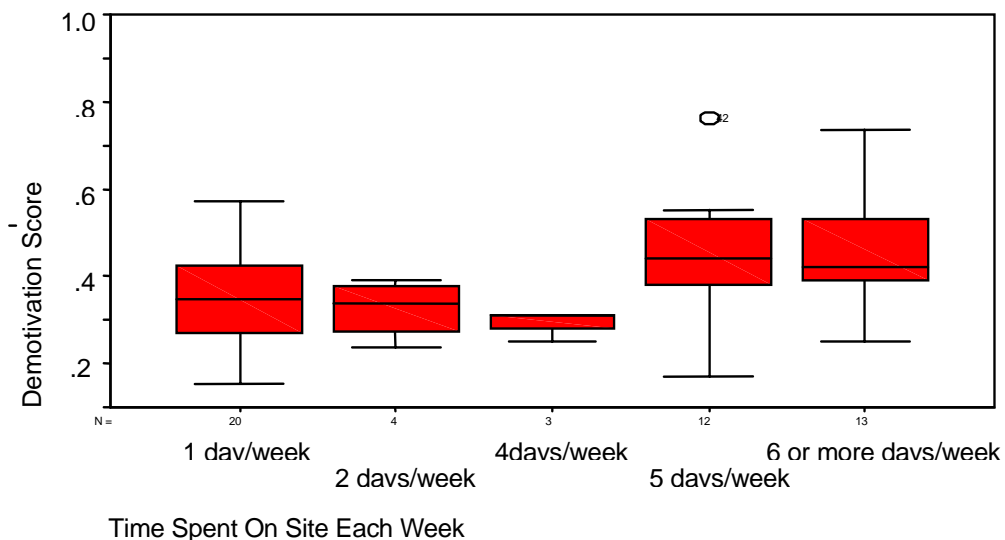


Figure 1: Demotivation according to site time.

Long Hours

The site time comparison found significant difference in the rankings of the importance of the catalogue item “long hours” ($p = 0.014$). The group on site 5 or 6 days per week ranked the importance of long hours (ie. more than 50 hours per week) sixth out of nineteen demotivating items, whilst the group on site between 1 and 4 days per week ranked the importance of long hours fourteenth. Therefore it can be stated that long hours are perceived to be a more important demotivator to “white-collar” workers on site 5 or 6 days per week than to those who spend less time on site. The item is also perceived to be more important to the age group aged 20 – 40 years who ranked the item ninth, than for the respondents aged 41 years or older who ranked the item thirteenth. Thus it is possible to state that long hours are a more important demotivator to the younger age group. Again, the relationship may involve additional factors; the results merely imply that the younger respondents experience less job satisfaction, or that their lifestyle is more important than work.

Non recognition for work done

Professional self-esteem is a feature of many motivation theories, and may be realised through public acknowledgment that a task has been completed successfully. The perceived presence of “non recognition for work done”, was shown to be greater for those on site full time who ranked the item fourth, compared to those on site part time who ranked it ninth; thus there was a significant difference of five places ($p = 0.027$).

Ranking differences for this catalogue item were not significant in other analysis categories. A number of possible explanations for the perceived lack of recognition by respondents on site 5 – 6 days per week were presented. They can be summarised thus:

site-based respondents may have higher expectations of recognition than office-based respondents due to differences in experience, personality or proximity to the project;

office-based respondents receive more recognition as they are in closer proximity to the source of the recognition givers and a communication barrier between office and site prevents the recognition being passed on;

the organisation provides recognition via indirect means – for example increased salary and fringe benefits, and

senior managers are not aware that non-recognition is an important demotivating factor to site based employees, and simply do not provide sufficient recognition.

Poor planning as a result of unfair resource distribution

The presence of “*poor planning as a result of unfair resource distribution*” was ranked fifth by those respondents on site 5 or 6 days per week, compared to eighth by those on site 1 – 4 days per week ($p = 0.046$). A rank difference of only three places does not indicate that this catalogue item is a source of major disagreement between the two groups. However the significance of this result allows a degree of confidence in the conclusion that poor planning as a result of unfair resource distribution is perceived to be slightly more present to the respondents on site, than to those in offices. Two possible explanations are presented for this result: firstly that poor planning as a result of unfair resource distribution is more present and more tangibly obvious on site (where demand more frequently exceeds supply than in an office). A second explanation is that employees on site prefer to have a detailed plan. Experience has taught site-based employees that the impact of poor planning and unfair resource distribution is greater on site than in the office, where the effect of poor planning is a more obscure problem.

Chaos/ad hococracy

The presence of “*chaos/ad hococracy*” was ranked sixth by respondents on site full time, and fourteenth by respondents on site part time. The rank difference of eight places was found to be significant ($p = 0.011$). This indicates that chaos/ad hococracy is perceived to be more present to “full time” respondents than to “part time” respondents. Anecdotal evidence recognises that the construction industry can be chaotic, especially if resources are not available or if plans are inappropriate, requiring impromptu decision-making and change. This is reflected in common adjectives of the industry being “dynamic” and “flexible”. However this does not explain the difference in perceived presence of chaos. A possible explanation for this difference lies in the nature of the construction site as a focal point for a temporary organisation which involves the coordination of multiple parties to construct a unique product where tasks are not clearly defined. Offices, conversely, may be regarded as a permanent collection of more defined tasks, and employees are in less proximity to the centre of productivity. This explanation is supported by Antony (1988) and Beardsworth *et al.*, (1988) who agree that the uncertainty of project organisations is greater than that found in permanent organisations (both from Loosemore, 1994).

Colleagues’ aggressive management style

The presence of “*colleagues’ aggressive management style*” was perceived to be greater by those on site 5 or 6 days per week who ranked the item third, compared to those on site 1 – 4 days per week who ranked it twelfth. The rank difference of nine

places was found to be significant ($p = 0.002$). The item is not significant in any other analysis category.

This result can be interpreted in different ways:

Site employees may be actually more aggressive than office employees. This may be a result of the personality of the employee or the nature of construction projects.

Project teams constitute a number of individuals who work in close proximity to each other and when a team member becomes aggressive, it is inevitable that others in the team become aware of this (and may respond).

Alternatively, a more studied argument for the significant difference between site and office based personnel, focuses on the prevalent culture of construction sites.

Sinclair (1998) discusses how organisations favour masculinity and how leadership and masculinity have become interwoven. Sinclair highlights a number of authors who have identified how managerial subcultures are built around masculinities. As a result of the culture, for example, male project managers or construction managers may believe that a display of aggression is acceptable behaviour in certain circumstances.

CONCLUSION

There is no clear relationship between motivation levels and the amount of time a “white-collar” worker spends on site. No significant differences in levels of motivation were found between those workers on site 5 or 6 days per week and those on site 1 – 4 days per week. Consequently, it is not possible to confirm that a relationship exists between the workplace environment and motivation for “white-collar” workers in the construction industry. By contrast, employees on site 5 or 6 days per week have significantly higher levels of demotivation than employees on site 1 – 4 days per week. The data therefore supports the hypothesis that the workplace environment affects levels of demotivation. The analysis also identified five catalogue items that cause significant disagreement between respondents grouped according to time spent on site:

the presence of “poor planning as a result of unfair resource distribution”;

the presence of “non recognition for work done”;

the presence of “colleagues’ aggressive management style”;

the presence of “chaos/ad hococracy”, and

the importance of “long hours”.

Motivation and demotivation levels did not significantly vary between male and female respondents. The data therefore does not support the proposition that female “white-collar” workers in the construction industry experience different levels of motivation or demotivation to their male colleagues.

Of these conclusions, the identification of a relationship between the construction site environment and demotivation is perhaps the most important. The extension of the relationship to include five demotivating catalogue items, which are perceived to be more present by site-based workers than office-based workers, allows clear recommendations to be made. This result is therefore the most valuable to industry.

The construction site has been identified as being an environment, which through the greater presence of four catalogue items increases demotivation. A reduction in

“white-collar” worker demotivation might therefore be achieved by a reduction in the presence of “*poor planning as a result of unfair resource distribution*”, “*non recognition for work done*”, “*colleagues’ aggressive management style*” and “*chaos/ad hococracy*”.

A TWIST IN THE TALE

The results of the research are tantalisingly significant and yet suggestively open-ended enough to indicate a need to examine further and discover with more certainty exactly why white-collar site employees have higher levels of demotivation, with a view to experimental change of some of the causal factors to see if the anticipated decrease in demotivation results. For example, if we do experimentally manage to reduce the presence of those factors identified as significantly correlated to increased levels of motivation will we see an actual and corresponding decrease in demotivation? The statistically insignificant motivation result would suggest not and would actually hint at the presence of other manipulative factors. Questions that arise from this pair of results include:

Are motivation and demotivation always similar in value? Hence if experiments were to successfully decrease levels of demotivation would there be an accompanying decrease in motivation?

Do those white-collar employees on site full time share some other characteristic which encourages them subconsciously to perceive negative factors in greater presence or importance than their on-site part-time peers, or even to dwell on negative aspects of any situation? Such a characteristic, known as negative affectivity might be a shared personality type. We do know that amongst the engineering profession one personality type (as interpreted by the Myers-Briggs Type Indicator) is more common (Johnson and Singh, 1998). Additionally the traditional perception is that there is a correlation between personality traits and job satisfaction, although this is now acknowledged to be a very simplistic view (Arglye, 1989). If this higher level of demotivation is attributable to personality traits then is it detrimental to the project or, like a degree of stress, does it have no effect or a positive effect on productivity?

The outcome of this research has been to identify an interesting and potentially important attribute of white-collar site-based construction employees. It has also highlighted an enormous gap in the field of knowledge of the application of occupational psychology to the construction industry. It is the recommendation of this paper that further research carries out several tasks, including defining the tool used to measure motivation and demotivation in terms of validity and reliability, investigating the influence of demotivation on productivity of these employees, to determine the relationship between personality and motivation of these employees and to arrive at a conclusion as to the benefit of reducing those factors shown by this research to be linked to demotivation.

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