

**SWP 4/98 GENDER AND MANAGERIAL MEANINGS OF
COMMITMENT IN HIGH TECH ENGINEERING
IN THE UK AND SWEDEN**

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**GENDER AND MANAGERIAL MEANINGS OF COMMITMENT IN HIGH TECH
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ABSTRACT¹

There are few reports about meanings of commitment held by managers. Engineers say that they know by gut feel when an employee is committed, but some find it difficult to express verbally what it means and how they know, yet they may be responsible for assessing it in others. Preliminary results from an interview study of 29 engineering managers and 8 senior technologists (20 males, 17 females, 17 British, and 20 Swedish engineers), all graduates, from director to senior technologist, show that there are differences in male and female engineers' meanings of commitment, as well as differences in meaning between the levels of management sampled. Women responded more often with less visible "commitment" meanings such as involvement and being available, ie good organisational citizenship attributes, whilst more men (and top managers) used the term commitment to mean task delivery, being proactive, using initiative, being innovative, adding value and being ready to take on challenge. The engineers' meanings seem to be a broad composite of work, organisational and career commitment, with an emphasis on very strong attitudinal/affective commitment and almost no emphasis on continuance commitment, in contrast to the traditional Mowday, Steers and Porter (1979) definitions of commitment. When individuals are evaluated in terms of their commitment for chartered status and for promotability by the mostly male engineering managers, then these differences may impact the process differently for men and women engineers. This paper reports part of an ongoing research project.

KEY WORDS: Gender, Commitment, Engineers, Careers, UK, Sweden

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INTRODUCTION

Evaluation of “commitment” is a topical and important issue for engineering managers, as the pool of high quality engineering graduates diminishes. The British Prime Minister, Tony Blair, commented recently that "only a small proportion - 24% - of engineering graduates go into engineering jobs in British industry on graduation. This is a huge waste of talent" (Blair, 1996). Employers are keen to recruit more high quality women engineers, but few top women engineering graduates join the profession in the UK and Sweden. There are few female role models in management, and women’s commitment is still questioned in the male-dominated world of engineering. The UK Engineering Council (1995) proposes that professional chartering of engineers should include an evaluation of their commitment by senior peers. If there are gendered meanings of commitment, this has implications for women engineers, who will usually be assessed by male managers. The purpose of this paper is to consider what meanings of general commitment are expressed by engineering managers and senior technologists when asked, without prompting or prior discussion, to describe what commitment means to them in a work context, to surface possible gendered differences in meaning.

Perceptions of commitment may be connected to issues around women’s roles and conflict between work and family commitments. British women managers with children have difficulties in finding adequate and affordable childcare, and career breaks are a luxury which few graduate women engineers dare to take. As Swedish women and men have good affordable childcare, career breaks and more flexible organisational arrangements (Wahl, 1992), the sample includes subjects from major Swedish organisations in the same industry.

MALE PERCEPTIONS OF WOMEN’S COMMITMENT

Male managers are reported as saying that women managers are not committed enough for senior positions (Wajcman, 1996, Schein et al, 1996). However, it is not clear what they really mean by "not committed enough". Devine (1992) and Evetts (1993, 1994) indicated that such attitudes were to be found in engineering management in the UK. It could be that this stated lack of commitment is being used by males as a rhetoric, through which, according to Parkin (1975), “people have license to explain and evaluate the causes and consequences of social relations”, ie the lack of women’s advancement to top management, especially in engineering. Rhetoric allows a justification to be made for power and exchange relationships, hiding the

possible discrimination underneath (Gowler & Legge, 1981). However, any evaluation of the explanations for the small numbers of senior women engineers has to take into account the fact that less than ten per cent of female engineering graduates go into engineering jobs (HMSO, 1994), and so the population is still very small.

THE CHANGING INDUSTRY CONTEXT

Previous research has shown that the same conceptualisation of commitment has stood for nearly thirty years (Guest, 1992). Yet the working environment has changed enormously since then. Previously, employers were concerned to retain all their employees, and so the kind of commitment which was important was likely to be that people should want to stay in their organisation, as well as be prepared to work hard. Since the 1970's, there have been large changes in terms of more women entering the full-time workforce, and there has been a shift of career management responsibility from organisation to individual in the new era of corporate downsizing and outsourcing - the new psychological contract between employee and employer (Stiles, Gratton, Hope-Hailey & McGovern, 1997).

At the same time, the aerospace industry has been subject to shortages of top quality engineers, and global recruitment drives have led to increased international opportunities for graduate engineers. This may be a threat to employers who lose the knowledge-holders or risk rewarding the potentially internationally mobile to the disadvantage of those perceived to be "stayers", damaging their "organisational commitment". The aerospace employers themselves reduce risk for their billion-dollar investments by increased cooperation across countries and global regions. As multi-national collaboration increases on major projects, and as restructuring of the aerospace and airline industry leads to new service and training arrangements between manufacturers and customers (users such as airlines, military, oil and gas, power generation etc), companies can offer more challenging career opportunities on multi-national teams, secondments, overseas postings, thereby growing the talents of their engineers whilst benefiting from their increased competence on their return.

EVALUATION OF COMMITMENT

Engineers are being given these increased opportunities to build up their own career experience portfolios, but can no longer expect that their present organisation will offer them employment for life. Dual career couples may not be willing to offer the husband's employer the flexibility

which was readily given when wives stayed at home. Does “commitment” still mean the same to employers and employees as it did, in an industry where historically organisations did invest in long-term career development for their graduate engineers? We need to examine what “commitment” means in the research literature, before reporting the results of this exploratory study into engineering managers’ meanings of commitment, part of a wider study researching the way in which perceived commitment may impact on career development opportunities for men and women differently.

THEORETICAL BACKGROUND

The Traditional Model of Commitment

Commitment has been extensively researched over the past twenty years. Studies suggest that “committed workers contribute to the organization in more positive ways than less committed workers”, and that there is no difference between men and women’s levels of commitment (Aven, Parker & McEvoy, 1993, p63). Commitment is frequently measured by asking employees to complete a well-validated instrument, the Organisational Commitment Questionnaire (OCQ), which conceptualises “commitment” into three sub-concepts, forming two sub-types of commitment (Mowday, Steers & Porter, 1979):

- “embracing an employee’s desire to remain in an organization (“continuance commitment”)
- willingness to exert effort on its behalf (“affective” or “attitudinal” commitment”)
- and belief in, and acceptance of the values and goals of the organization” (also “affective/attitudinal” commitment”).

In Britain, the OCQ was adapted by Cook & Wall (1980), resulting in the British Organisational Commitment Scale (BOCS), which operationalised commitment with three items each for the sub-components of commitment: involvement, identification and loyalty. The BOCS is the main measure used in the UK, according to Peccei & Guest (1993), who comment on the emphasis given to “desire to stay” and “pride” in the OCQ and BOCS. The questions are broad and arguably are intended for general use rather than being aimed at high-flying employees. This paper will show that interviews with both men and women engineering managers surface understandings of the term organisational commitment, which would not be satisfactorily addressed by the questions asked in the OCQ and BOCS, if their commitment

were to be measured by these instruments, and this is important for managers appraising commitment and taking promotion decisions based on such appraisals.

Definitions of Organizational Commitment from Employees vs from Researchers

A feature of the body of research on organizational commitment is that few researchers have recently asked people in organizations what they understand as commitment. Popular definitions, especially those of Mowday et al (1979) and Meyer et al (1993) are taken for granted. The employee's own experience of commitment is important, however, according to Reichers (1985) and this theme is picked up again in Randall, Fedor & Longenecker (1990). They sought to explore how employees (but not managers) expressed commitment themselves, in their behaviours and actions, by asking them directly. The employees did have different definitions to the popular management definitions: in particular, the concern for quality, a sacrifice orientation, and willingness to share information. These important features are lost when commitment is measured using the OCQ, and this demonstrates that other approaches to investigating commitment are needed. Randall et al recommend more qualitative research in this area of conceptualisation of organizational commitment. This study seeks to provide evidence for further theoretical development by examining what commitment means to managers in engineering, and considering the possible impact of gender and managerial level on those meanings, which may affect the process of commitment appraisal.

Gender and Commitment

A meta-analysis of previous organizational commitment, its antecedents and correlates research, found almost no difference in male and female managers' commitment (Mathieu & Zajac, 1990), but recommended further research into moderators such as age, job satisfaction, role states, leader behaviours and organisational characteristics. Aven et al (1993) undertook a further meta-analysis focusing just on gender and attitudinal commitment, using data from 27 samples with over 14,000 subjects. They investigated whether there was stronger evidence for a gender model of commitment, where men and women are seen to have different commitments based on their social roles, women deriving their identity more from their family role; or a job model, which holds that men and women have similar commitment, but that the job role experience may be different for men and women. Results showed no significant evidence for either model. They found that attitudinal (affective) commitment was not related to gender, nor was job type a moderator of the relationship. The link between continuance

commitment and gender was not included in the study. The key finding, therefore, was that gender had virtually no impact on an individual's belief in the organisational goals, nor on the willingness to exert considerable effort on behalf of the organisation.

Impact of Perceptions of Commitment

Recent research by Shore et al (1995) has shown that those people who are perceived to be more affectively/attitudinally committed (willing to work hard, and to internalise the organisational goals) are more likely to be seen to have high potential. They are then more likely to be given career development rewards (Allen, Russell & Rush, 1994) than those with perceived high continuance commitment, who are seen to want to stay in the organisation because of their own investment in "side-bets" such as pension, accrued holidays, and status, but who also may have no other options of employment. So the kind of commitment is significant when talking of commitment as an organisationally desirable attribute in managers, but previous research has not unpacked what "commitment" means to managers themselves.

Rationale for the UK/Swedish cases:

This is a study of individual engineers' meanings of commitment. Approximately half the cases have been chosen in Swedish organizations to check the allegedly better organizational flexibility, childcare availability and social benefits for women engineers in Sweden. This provides a useful addition to the range of workplace contexts in which women engineers function, which may indicate the importance of structural issues in commitment and careers. However, this raises the issue of cross-culture inherent in any two-country study.

Culture: It is recognised that the Swedish national culture will have an impact on responses coming from Swedish engineers. For example, in terms of management styles, Sweden ranked lowest on Hofstede's masculinity index of 39 countries, whilst Great Britain was near the top in 8th position (Hofstede, 1984). Feminine cultures tend to be process-oriented, with emphasis on interpersonal relationships, whilst masculine ones are more results-driven, concerned with power and control. However, Gerpott, Domsch & Kettler (1988) state that in high tech companies such as those in aerospace, the sense of technological excellence overrides other considerations, engineers across national boundaries being more likely to share the culture of other engineers than fellow-countrymen. They say that "R&D professionals may form a special

occupational subculture across countries, because scientific methods and standards are generally valid independently of country boundaries".

Language: There is a possible bias in that the word "commitment" does not easily translate into one Swedish word. Dictionary definitions include Swedish words for involvement, duty, and dedication, which would cause bias in explanation of meanings, emphasising those three subconcepts above other possibilities. However, engineers in this industry are used to working in English, which is used for management training as well as for technical reports, conference papers and joint projects. It was therefore decided that interviews would be conducted in English, with discussions in Swedish around any issues which need clarification. This has the advantage of allowing the concepts at first level coding to emerge from the interviewees' own English words, keeping closer to the data.

RESEARCH METHODS

As commitment is such an abstract construct, concerned with values, attitudes and behaviour, it was felt that it would be difficult to ascertain engineers' meanings by questionnaire, and therefore a qualitative approach was taken to elicit meanings and perceptions of commitment. Singh (1997) gives more detail on the background to the study. The ontological position is realist - the study attempts to surface engineers' true meanings of commitment by constructed conversations with an informed researcher. It is held that these semi-structured conversations and the subsequent analysis present a view of reality, not necessarily the truth (Tsoukas, 1989; Silverman, 1993).

The research design was broadly guided by two primary propositions reported in this paper:

P1. That gender moderates the meaning of commitment to engineers.

P2. That managerial level moderates the meaning of commitment to engineers.

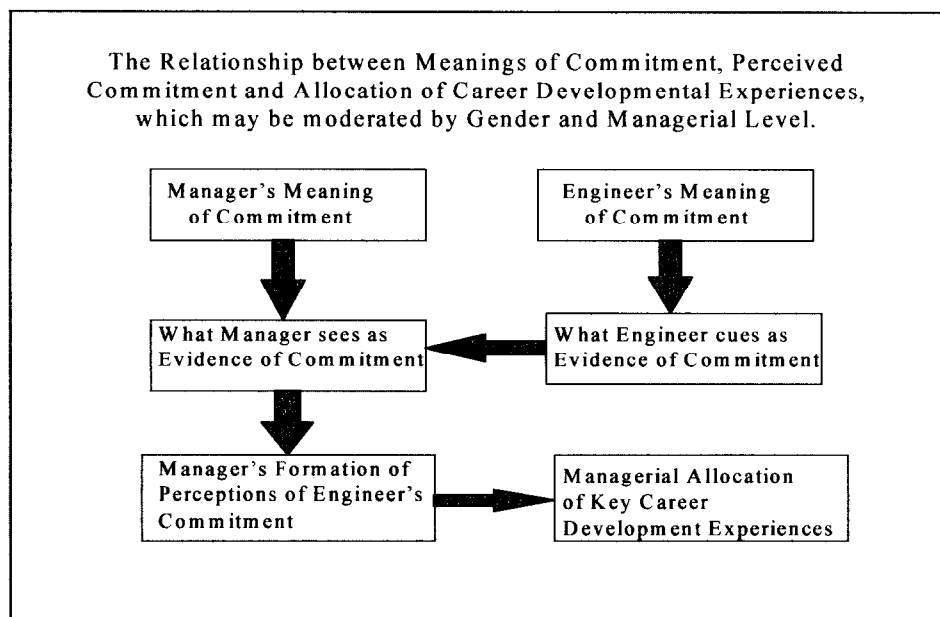
Later papers will report on propositions relating to meanings of commitment and the cueing of commitment. Figure 1 maps out the exploratory study.

Managerial Levels

Dalton, Thompson & Price (1977) in their study of engineering careers and performance showed that there were four stages to engineers' careers: Stage 1: Apprentice (characterised by helping, learning and dependency); Stage 2: Colleague, (independent contributor); Stage 3: Mentor (assuming responsibility for others, training and interfacing with others); and Stage 4:

Sponsor (shaping the direction of the organisation, and exercising power). This study is concerned with those in Stages 2, 3 and 4, as those in apprentice positions may not have yet gained an understanding of what commitment really means in their organisational careers. Top managers are included as they may play a strong role in determining the meaning of commitment for the organisation, as custodians of the commitment cultural norms, whilst those in Stage 3 are responsible for much of the early-to-mid career evaluation of competence and commitment, resulting in career development opportunities for those in Stage 2, the independent contributors.

Figure 1: The commitment assessment process



Participants

Approaches were made by the female researcher (who was familiar with the industry in both countries) to senior contacts in three aerospace organisations to identify matched pairs of male and female engineers across a range of management levels from directors to project leaders and technologists, who would be willing to take part in a study researching women and men engineers' careers in the UK and Sweden. The potential interviewees were then approached by the contact and the researcher, and meetings were arranged. Matching was on the basis of age, qualifications, similar type of department and job title, although it was sometimes not possible to obtain a close match on all the criteria in the smaller Swedish organisations. There were no Swedish women engineer directors, and the much flatter Swedish organisations meant that it

was more difficult to allocate interviewees to a managerial category exactly equivalent to those more clearly defined in the British organisation, so guidance was sought from the senior contacts, and from the interviewees themselves as to their managerial category for the purposes of this study. The youngest engineer was age 28, the oldest was 59, and job levels ranged from senior technologist to senior director. In the whole sample, 27 were married, and a further five lived with a partner. Of the nine UK women, five were married, compared with six out of eight Swedish women. Only a third of the UK women had children, compared to five of the eight Swedish women. Twelve of the 20 men had children.

TABLE 1: The Research Participants

ORGANISATIONAL LEVEL	UK ORG 1	SWEDISH ORG A	SWEDISH ORG B
Directors/Top Managers	3 males 3 females	3 males	2 males, 1 female
Middle Managers/Senior Professionals	3 males 4 females	3 males 3 females	2 males 2 females
Junior Managers/Senior Technologists	2 males 2 females	1 male 1 female	1 male 1 female

Interviews

Semi-structured interviews were conducted over a period of nine months on company premises in a private office during work time, typically lasting one to one and a half hours. Guided conversations helped the engineers to surface their meanings of commitment via descriptions of role models of commitment, as well as discussion of how they demonstrated commitment and perceived and evaluated it in others. Towards the end of the interview, the issue of gender and perceived commitment was raised, after rapport had been established.

Interviews have been held with 37 engineers, including 17 women, in three large organisations in the UK and Sweden. Thirty-five full interviews were tape-recorded and transcribed, two briefer meetings with top Swedish managers being noted afterwards. The Swedish engineers in the sample were all fluent English-speakers, and the researcher is fluent in Swedish, having lived in Sweden with work experience as a translator. The one-to-one interviews in Sweden were all conducted in English, although where the questions were not clearly understood, clarification was given in Swedish, so that the researcher was sure that the engineer had understood the question.

Data analysis

The qualitative data are now being analysed mainly using a grounded approach, to identify concepts across the data, which could be categorised into higher level constructs (Strauss & Corbin, 1990; Lofland & Lofland, 1995). The data have also been examined quantitatively for patterns in the responses. Given the small number of interviewees (37), it is not appropriate to check for statistical significance, but trends in responses amongst the categories are of interest, and assisted in the identification of concepts and themes from the qualitative data (Miles & Huberman, 1994). The management of the qualitative data, and the exploration of relationships between the categories are being done with the help of the qualitative analysis software, QSR NUD.IST 4 (Non-numeric Unstructured Data Index Search Theory). Although these data are from a relatively small number of respondents, the responses are meaningful, given the leading positions of the companies from which the sample was taken, and the key positions which most of the respondents in the “senior management category” hold in those companies.

RESULTS OF THIS STUDY

The Meaning of Commitment

Many of the engineers interviewed said that they had never thought precisely before about the meaning of commitment, nor how they recognised it. They simply had a “gut feel” when commitment was there, and it underpinned how they felt about their subordinates, their peers and their managers.

“I can’t say that it’s an issue I’ve ever thought about - I just sort of do it” (*UK female director*)

“We use the words. We get into conversations as to whether so and so is committed or not, or how committed” (*UK male senior manager*)

“What a difficult question. Commitment, well, I never really thought about it - well, I suppose I have thought about it.” (*Swedish female middle manager*)

“Not a very easy thing to answer right away. I guess it is different for different people, but at least, my experience is that if I have an interesting job, and something good to do, I usually get too involved in everything, so I guess that’s some kind of commitment.” (*Swedish female middle manager*)

Table 2 shows the listing of the initial descriptors for “commitment” elicited from interviewees, ranked according to the number of individuals responding. It is important to note that multiple meanings of commitment from individuals were allowed. In addition, these responses were given at the outset of semi-structured interviews, without a list being shown to the interviewees, so their meanings came from within themselves, and were not triggered by the

researcher. It was intended to capture the initial voiced meanings of commitment, although more were explored and expressed during the rest of the interview, as interviewees had time to reflect. There are a number of other responses which were cited by less than 20% of the sample, which are not listed here, of which the most interesting may be that only two younger engineers and one senior mentioned “continuance commitment”, i.e. wanting to stay in the organisation.

Table 2: Percentage of respondents using each of these terms as unprompted meanings of commitment (n=37)

Meaning	total %
task or objective delivery	65
put yourself out, do extra	65
involvement	59
quality	59
be proactive, use initiative	51
do best for organisation	46
put in the extra hours when necessary	41
want to succeed, need to achieve	41
dedication	38
be ready to take on challenge	35
enthusiasm	35

Meaning	total %
responsibility	32
be concerned for people	30
find solutions, troubleshoot	30
be available outside hours	22
be creative, innovative	19
be professional	19
add value, don't waste resources, be business-aware	19
share information	19
get a balance between work and outside	19
want to make a contribution	19

Task Delivery. Table 3 shows the three responses which were given most often by men and women, by British and Swedish engineers, and by different levels of management. This shows that across all the sample, the top responses were Task or Objective Delivery, and Putting Yourself Out/Doing the Extra, with two-thirds of engineers mentioning these. The breakdown shown in Figure 2 identifies that senior engineering management sees them as more important than do middle and junior management/senior technologists. An explanation could be that the senior managers are more personally entrusted with delivery of larger goals, and know that they have to put in whatever effort it takes to deliver what was promised. There are some differences between UK and Swedish engineers, particularly “task or objective delivery”, cited by nine out of ten Swedes, but only four out of ten British engineers. Fewer women than men responded with “task delivery” as part of commitment, 59% to 70%. Task delivery was seen as

something often linked to putting yourself out, instrumental commitment for successful delivery, and senior male managers in both UK and Sweden mentioned this.

“sufficiently dedicated to achieve those objectives” (*UK male director*).

“It’s a willingness, or even a desire, to do, to put themselves into difficult circumstances, to do the difficult thing, if that is what the business requires or what the situation requires.” (*UK male senior manager*)

“If you take on a task with a goal, then you should work towards that goal commitment means that you should, you have to deliver to that date.” (*Swedish male top manager*)

Table 3: The most frequent responses from the engineers from particular groups

GROUP	MOST FREQUENT MEANING	2ND MOST FREQUENT MEANING	3RD MOST FREQUENT MEANING
Male engineers	*Task or objective delivery	*Put yourself out, do extra *Be proactive	
Female engineers	*Put yourself out, do extra *Involvement *Quality		
British engineers	*Put yourself out, do extra	*Hours put in *Quality	
Swedish engineers	*Task or objective delivery	*Involvement	*Put yourself out, do extra
Top managers	*Put yourself out, do extra	*Task or objective delivery	*Be proactive, use initiative
Middle managers	*Involvement	*Task or objective delivery *Put yourself out, do extra *Want to achieve	
Junior managers/ Senior technologists	*Quality	*Task or objective delivery *Doing best for organisation	

Put Yourself Out. Women engineers responded more often with “Putting yourself out” than men. When the data were examined more closely, it became clear that UK women responded thus more than their Swedish women engineer counterparts, whose response level for this item was the same as the UK males. Slightly fewer Swedish men gave this meaning. An explanation could be that it falls more often on UK women to sort out family responsibilities when work demands it, than on men.

From later on in an interview: “I can, where the job demands it, rearrange my life to suit the particular commitment I am being asked to do, the particular work problem that needs to be done, the timescales to meet, or a meeting which is not in my normal day, or go away on business - that does interfere with my commitments outside work, but on the whole, if I could possibly manage it, I would juggle everything around, and as long as I have a support service round me that can handle the fact that I have children, that I have more of a caring role than my husband who is also a XX employee, more of it falls to me to organise this, that and the other, to make sure that they are at the right place at the right time, school, playgroup, so I have to have that as well always at the back of my mind. Where I can, I do juggle my other commitments, but I can’t divorce the two.” (*UK female middle manager*)

“You have to be prepared to take more compromises with your personal life, than when as a junior or lower middle manager, when, if you’re in the right job, you can still keep a fairly regular life style with it. You certainly can’t now. You have to be committed to provide time when you’d rather not.” (*UK female director*)

Figure 2

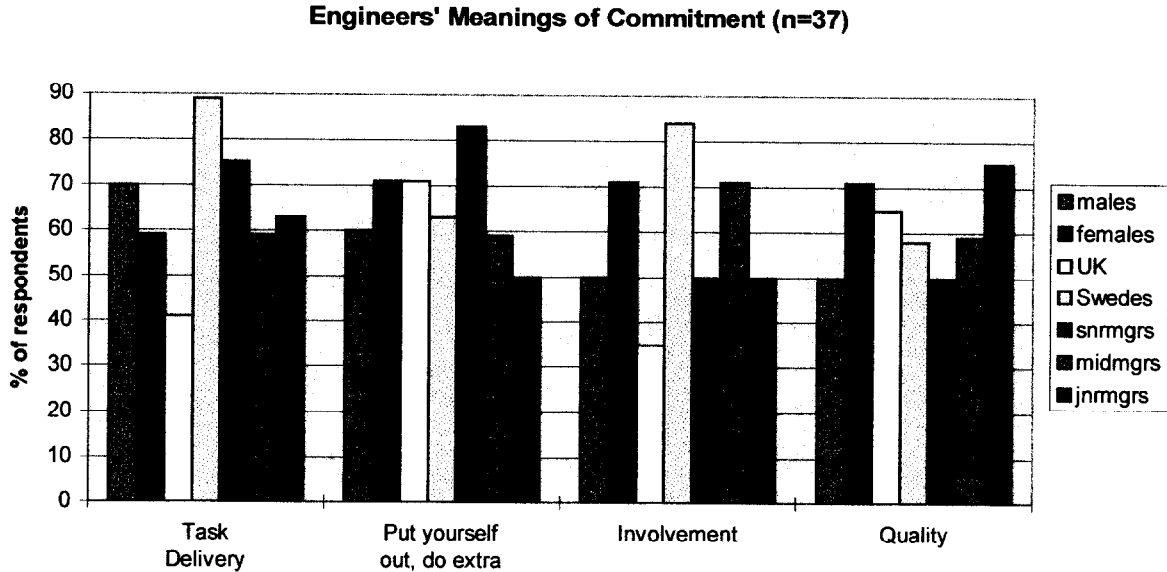
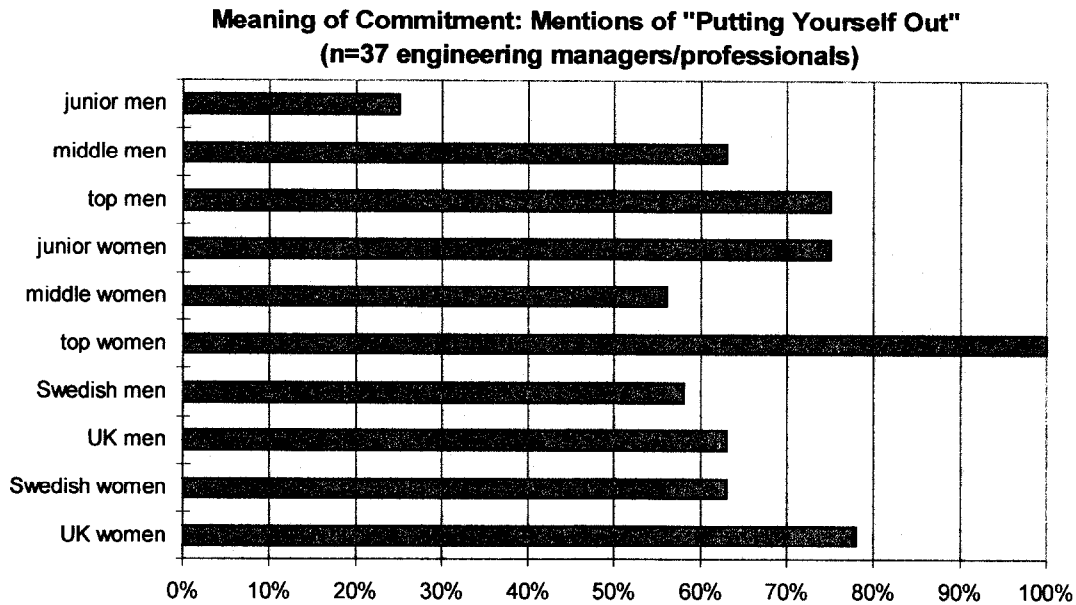


Figure 3



In contrast, Swedish women have the benefit of more accessible and more affordable childcare, and organisational flexibility (Brewster et al, 1996), and evidence from the Swedish interviews shows that they expect their husbands to share regular childcare duties such as taking and collecting children from daycare. Hence they may have more similar patterns to the UK and Swedish men in terms of having to put themselves out. There was evidence of considerable “putting oneself out”.

“Now I have to live in a flat in xxxtown, and I live in yyycity, so I have to give up seeing my husband during the week most of the weeks, and that’s a compromise.” (UK female director)

“working whatever hours are necessary in order to fulfil those objectives” (*UK male director*)

“It’s like being asked to go abroad at two minutes notice, and going.” (*UK female senior technologist*)

Involvement. There was a difference between men and women engineers on “involvement”, where half the males but nearly three-quarters of females, including all the Swedish women, mentioned this. The senior managers responded less frequently with the word “involvement” as a meaning of commitment than their middle management colleagues. This may be because they have had to be involved to achieve their senior positions, so involvement is the norm for them, whereas it is a desirable feature for those lower down the organisation, and may therefore have been mentioned in this introductory question about the meaning of commitment.

“Commitment to me would be to assume the responsibility and take it to your heart, if you like. At the deeper level, you get personally involved in an issue” (*Swedish male middle manager*)

“The more involvement I can feel about what I am doing, the stronger will that commitment be, because that is very important.” (*Swedish male middle manager*)

“You feel a sense of allegiance, you feel part of it, part of the team” (*UK male middle manager*)

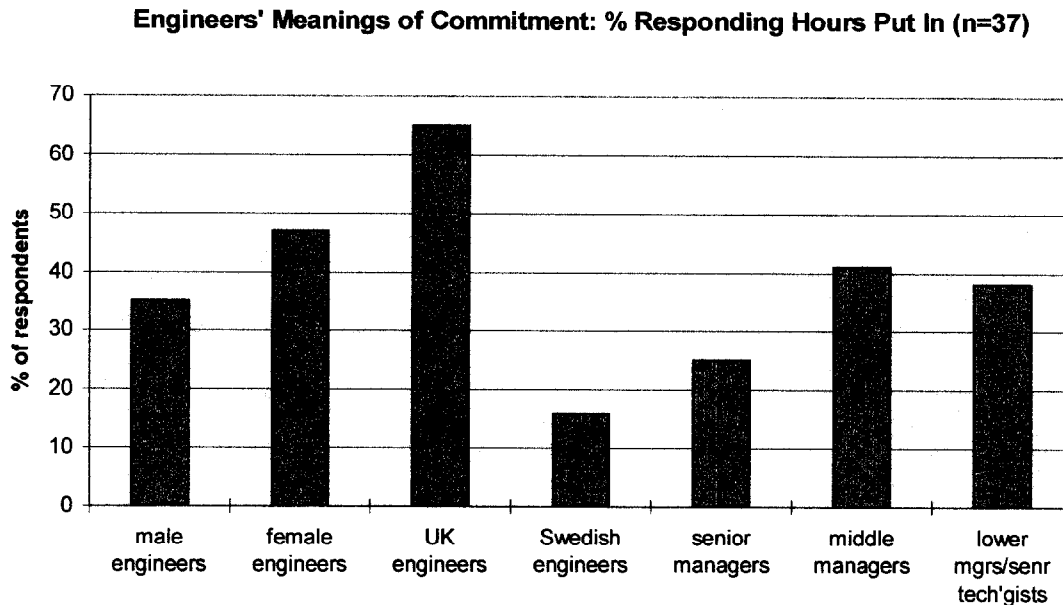
“Commitment means involved - a certain amount of dedication, loyalty, will and enthusiasm towards whatever it is an organisation is trying to achieve. And implicit in that is a commitment to all aspects of that entity, to its people, particularly to its employees, to its products or services, to its customers, to its shareholders, to its suppliers, to its partners, its stakeholders, and also to its neighbours.” (*UK female director*)

“I think involvement is very important to be able to manage with delivery and duty. I think you have to have that in you.” (*Swedish female middle manager*)

Only a third of British engineers mentioned “involvement”, compared with 84% of Swedes, including all the Swedish women but only 44% of the British women. This may be a reflection of the differences in participation at work between the two countries. Sweden has had worker representation on boards for many years, and employees expect to be involved at work regardless of their social class (Holden, 1996). In a cross-cultural survey of male management across 39 countries in one multi-national organisation to identify national management styles (Hofstede, 1980), Sweden was ranked 10th, considerably below Britain’s 3rd ranking on a measure of individualism versus collectivism based on work goals, related to “the emotional (in)dependence of an individual on groups, organisations or other collectivities”. From the Hofstede study, a further dimension, masculinity vs femininity of national management style, showed Sweden with top ranking of 39 countries on femininity, whilst Britain was 31 places higher, at 8th place at the masculinity end of the dimension. As the predominant work style on the “masculine” side is related to assertiveness in organisations, whilst the “feminine” work

pattern is more nurturing, more inclusive, this again may have some relationship with the Swedes' much higher use of the meaning of commitment as "involvement".

Figure 4



Respondents citing Hours put in as Meaning of Commitment. There were large differences between the numbers of engineers in the UK (two-thirds) and Sweden (only 16%) with the response that commitment is to do with hours put in over and above the normal working hours. Nearly half of the women engineers gave this response, compared to only a third of their male colleagues. About 40% of middle and lower managers also gave this response. See Figure 4. The work patterns in the UK with the longest average working hours per week in Europe are likely to have influenced this response. Swedish engineers would largely be unwilling to work long hours over the normal working week other than when absolutely necessary. Female engineers may be responding that commitment is "hours put in" because they recognise that this is a problem area for those women with small children - they are often seen as less committed because they are not able to work overtime. On the other hand, many engineers say that is not "less commitment but less availability", a different concept, but equally important for organisations when they need managers to work outside normal hours.

"A lot of people look upon commitment as a willingness to put in all sorts of hours. I think there is an element of that, but that's not the whole story. It's dedication, if you're only available during eight hours of the day, dedication during those eight hours is just as much commitment as someone who stays there till midnight." (*UK female senior technologist*)

"Certainly some people in senior positions, you can see that they give up an awful amount of their time to the company. I don't think that's the only way of measuring it, but that's an easy

way. So they work very long hours, and give up other things, and put the company first. I know some people who have to give up booked holidays for the company - that is definitely commitment.” *(UK female middle manager)*

MEANINGS OF COMMITMENT: CHALLENGE, INNOVATION, VALUE-ADDED

This section examines some sub-concepts of commitment which senior managers mentioned more frequently than those below them. These attributes may be particularly relevant for engineers in the increasingly global and competitive workplace. The development of engineering talent has long been a major consideration in the aerospace industry, but never before has the emphasis been to this extent on business awareness, international competition and collaboration, and innovation, with the ownership of that push for career development being transferred to the individual, yet facilitated by a learning organisation. Growing by overcoming challenge is a means whereby both company and individual benefit. From the responses, senior managers are more readily expressing the need for active involved commitment to the organisation and to the personal career, through being proactive, taking the initiative, seeking and taking on challenges, being creative, innovative and adding value to the company and themselves.

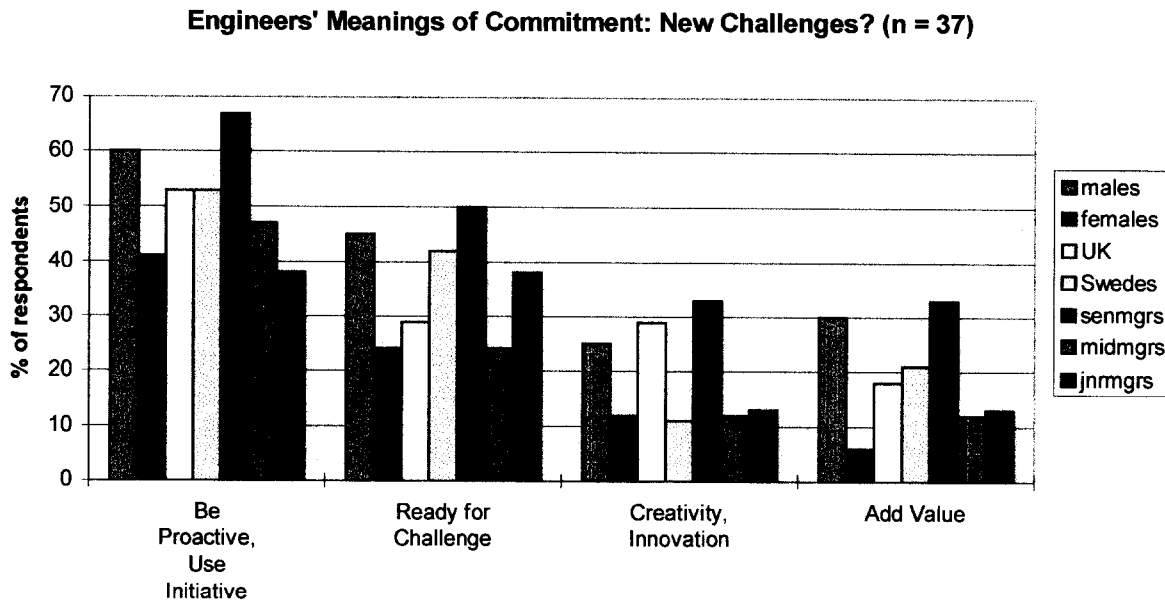
Be Proactive, Use Initiative. Figure 5 shows that there were similar levels of responses from both UK and Swedish engineers, but 60% of males responded with this concept, compared to only 41% of women. This seems to be an important feature of commitment for senior managers, who responded in this manner nearly twice as often as junior managers/senior technologists, middle managers falling in between. This may impact on how commitment is evaluated by senior managers. Some engineers made the following comments:

“Not coming in and doing my job as I can do it with the resources I already have in front of me, but making sure that I am tapping into the resource system that exists in a much broader field.” *(UK female director)*

“Commitment in the job is, you’ve got plans, you’ve got to achieve those, and to put the effort in, and to push people, to actually get those plans achieved on time ...it’s actually being very enthusiastic and wanting to actually improve things, and make steps forward for the company, both personally and in the technical sense as well.” *(UK female middle manager)*

“It’s a bit more than just plodding on and following instructions. It’s using the initiative, to really understand what the problem is, and coming out with a proper answer, rather than just one which fits the timescale and one that is the way we did it before. I think it’s an attitude to not just accept what has been done before, it’s an attitude to think, well, first of all, is this the right way to do it. The action part is usually being proactive.” *(UK male senior technologist)*

Figure 5



Ready for Challenge. Figure 5 shows that 45% of men but only a quarter of the women mentioned taking on challenge as a part of the meaning of commitment. More Swedes mentioned this than British engineers. Half of the senior managers felt this was an important feature of commitment. Thirty-eight per cent of junior managers also mentioned this, which may mean that they recognise the significance of taking on challenges and growing their competence to the benefit of themselves and their employer.

“I actively seek challenges, because that is the only way to learn. Sometimes it is a bit scary when you want to do this leader role in the group, but you have to do it to learn something new, so you throw yourself into that.....Perhaps sometimes you just try to see what happens, but as you get more experience, you get more and more comfortable with new challenges, you know what you can do.” *(Swedish male team leader)*

Sometimes women were seen to be less committed to taking on challenge. However, some successful women felt that these were unfounded assumptions made by men based on gender roles, and that women had to demonstrate their commitment to such opportunities forcefully..

“To me, they seem to need more of a group acceptance, very often the group of other women, acceptance to do something new. I think it is a bit of not being intimidated by the fact that they might fail or stick out.” *(Swedish male middle manager)*

“It will often be assumed that you’re more interested in your home life and that your job will come second, and that you won’t travel. You have to forcibly say, I want to do this, and I would do that. You have to make it clear, or otherwise they’ll work on the assumption that you’re stuck where you are.” *(UK woman middle manager)*

Creativity and Innovation. Whilst a quarter of male engineers talked about commitment meaning creativity and innovation, Figure 5 shows that very few women mentioned this. Nearly a third of UK engineers cited this meaning, compared with only a tenth of Swedes. A third of senior managers mentioned creativity and innovation, whilst only one in ten of middle and junior managers respectively used those meanings when describing commitment.

“Commitment to my team is very strong. That is the basic element of the work, to provide the best possible atmosphere. It is a resource for creation.” (*Swedish male middle manager*)

“To have the creativity and the courage of that creativity, you’ve got to have some commitment as to why you are doing it. If you haven’t got that, why bother? Don’t you think engineering is a bit like that as a profession? It’s complicated. There isn’t always a solution. There’s lots of laws and rules and things, but the sum total of it is not easily prescribed. And two, three engineers may have completely different ideas on how you do something. They may both be right, by the way. There are many solutions. But you have to have that commitment to actually go out and try it your way.” (*UK male senior manager*)

“Some people maybe are creative within themselves, but I think you are more creative if you are creative with others” (*Swedish female middle manager*)

Adding Value. Figure 5 shows that commitment may be related to a growing need for business awareness in high tech engineering. A third of senior managers saw this as important, compared with only a tenth of their subordinate managers and top technologists. Swedish engineers mentioned this more often than the British, but the most noticeable difference here is that most of the women did not state this as part of commitment, only three mentioning it at the beginning of the interview.

Commitment is “that you’re giving satisfactory, or more than satisfactory answers to your own internal customers you should give just enough information in just the right amount of time and no more, as if you are doing more than that, although it is commendable and laudable, it is also spending the company’s money and time, that they don’t actually want.” (*UK male senior technologist*)

“It’s being able to think about the needs of the company, you know, testing time is very expensive and any delays obviously cost money, but can have a knock-on effect in terms of getting products out of the door, which again brings money into the company” (*UK female middle manager*)

“It’s excellence in the context of doing what the customer wants, on time and at cost, so it’s not excellence for the sake of it, and it’s not excellence in a gold-plated sense. But it’s doing things properly and doing them right.” (*UK male senior manager*)

An Overview from Different Managerial Levels: “What does commitment mean?”

Table 4 shows typical responses for the three managerial levels included in the study. These quotes show the considerable depth of commitment held by these engineers. Women engineers were more likely to describe commitment in terms of the balance between work and outside lives, and the very senior women were taking opportunities outside their normal towns of

residence at considerable disruption to their personal lives. Top managers talked of commitment very often in terms of objectives, whilst middle managers talked of tasks, particularly those with project management experience. Almost all the engineers expressed willingness to work late, weekends, when it was necessary, but women with young children at the senior technologist level were more likely to admit that their family commitments had to come first, although with prior notice, they could make arrangements to work outside normal hours.

Table 4: Some Responses to “What does commitment mean to you in a work context?”

TOP WOMEN ENGINEERING MANAGERS	TOP MALE ENGINEERING MANAGERS
“You put your energy into doing it”; “You have to make a lot of choices”; “..... not enough hours in the day”. <i>British director, age 45, married, no children</i>	“taking responsibility for your own objectives” <i>British, age 44, married, 2 teenage children</i>
“I have to arrange my life”; “how I prepare myself for the demands of my job”. <i>British director, age 42, married, no children</i>	“have a sense of urgency” “desire to achieve the objectives”; “sufficiently dedicated to achieve”. <i>British director, age 41, married, 2 children</i>
“it means involved subjugating some things that you might wish to do for yourself” <i>British director, age 43, single, partner</i>	“go the extra mile”; “being creative”; “take on challenges, learn from mistakes” <i>Swedish Chief Engineer</i>
“it’s a promise to deliver it” <i>Swedish manager, age 55, married, adult children</i>	“it’s getting a result”; “to find the way” <i>British senior manager, age 52, married, adult children</i>
	“you try to exceed”. <i>Swedish senior manager, age 40, 2 young children</i>
	“put the company needs above your own”; “take on challenges”; “involvement”. <i>Swedish director, married</i>
MIDDLE MANAGER WOMEN ENGINEERS	MIDDLE MANAGER MALE ENGINEERS
“taking the chance to have responsibility”; “the trust that my manager has in me”. <i>Swedish project leader, age 33, married, 2 yr old child</i>	“assume the responsibility and take it to your heart”. <i>Swedish, age 34, married, 3 young children</i>
“my whole life is a commitment”; “to do the best in my job, at the same time do the best for the kids and for the family”. <i>Swedish, age 34, married, 2 young children</i>	“I would stay till the middle of the night” <i>Swedish, age 42, married, 3 children</i>
“you are responsible for results”. <i>Swedish, age 36, married, 2 young children</i>	“I trust the other people and he can trust me” <i>Swedish, age 50, married, 3 children</i>
“making steps forward for the company”; “actually being around” <i>British, age 38, single with partner</i>	“take on a task, and then you have to do your very best with it”. <i>Swedish, age 59, married, adult children</i>
“it does require giving up something else”. <i>British, age 41, married, no children</i>	“above and beyond what is absolutely necessary”. <i>British, age 36, single</i>
“loyalty”; “it’s caring about how what you do affects the company”. <i>British, age 36, married, 2 young children</i>	“believe what you are doing matters”; “helping people to perform” <i>British, age 36, married, 3 children</i>

JUNIOR MANAGERS/SENIOR TECHNOLOGIST WOMEN ENGINEERS	JUNIOR MANAGERS/SENIOR TECHNOLOGIST MALE ENGINEERS
<p>“beyond the call of duty” “being asked to go abroad at two minutes notice” <i>British, age 28, single with partner</i></p>	<p>“not just accept what was done before”“you feel what you are producing reflects on yourself” <i>British, age 29, married, no children</i></p>
<p>“that I have a job that I am happy with and that my employer is happy with me, and I know what is expected of me”, <i>Swedish, age 31, married, one child</i></p>	<p>“doing your best in every situation: really putting your soul into it” <i>Swedish, age 30, single</i></p>
<p>“working many hours after working hours”; “work hard and learn enough and contribute with something new”. <i>Swedish, age 30, single with partner</i></p>	<p>“responsibility - and that you enjoy your work also” <i>Swedish, age 30, single</i></p>
<p>“it’s the quality of work done in 8 hours, not how many hours you stay after working hours” <i>British, age 38, married, 3 young children</i></p>	<p>“that you are giving more than satisfactory answers”, <i>British, age 40, married, 2 children</i></p>

DISCUSSION

This study provides some evidence that the meaning of commitment held by managers in engineering is not in line with commitment as defined in the management literature which emphasised continuance commitment. Further studies may indicate whether this is common across different industrial sectors and countries. This study indicates a strong link between commitment and innovative behaviour, coming straight from the words of leading men and women engineering managers in the UK and Sweden. The “continuance” element operationalised as one of the two key aspects of commitment by management researchers previously (following Mowday et al, 1979) seems no longer to be an important aspect of commitment for engineering management in the global workplace of the nineties.

The primary aim of this paper was to consider whether gender and managerial level impact the meaning of commitment held by engineering managers, when expressed without prior prompting. These results indicate that there are some differences between men and women engineers’ meanings of commitment, which become more significant when the responses from top, middle and junior management levels are reviewed. The senior managers’ responses are closely aligned to those from the overall set of male engineers, whereas the set of women engineers’ responses are closer to those of the average set of the senior technologists rather than managers, despite the women being broadly matched in levels and age to the men in the middle and junior manager category. However, there were only half as many females (four out

of twelve) in the top category as the males, and so that is likely to have influenced the alignment of the responses.

Where the female engineers' responses were different from those of their male peers, they seemed to fall into a less visible category of meaning of commitment, related to high levels of organisational citizenship behaviour, defined as "constructive or cooperative gestures that are neither mandatory in-role behaviors, nor directly or contractually compensated by formal reward systems" (Organ, 1990). The male engineers' responses relate to a more active meaning, perhaps more visible to managers, and enhancing personal career development through seeking challenging assignments, finding solutions, innovation, creativity and business awareness. These are important attributes for engineering organisations to encourage, to nurture innovation to develop new technologies and products (Quinn, 1985).

Senior managers are the custodians of the future, and their sense for creativity, challenge and innovation should be imparted to those below, along with a business awareness, a customer orientation and a response to the need for involvement from their subordinates. Engineers at the threshold of management feel commitment is being ready for a challenge, and it is up to middle managers (who mentioned this less often) to recognise this, to take advantage of the enthusiasm for career growth and the desire for involvement, and to facilitate the development of their teams into more competent, committed engineers, providing the resource for sparking off creativity, as mentioned by some of the engineers. Lower level engineers need to acquire the "added value" concept, as well as take responsibility for their own career development, but understand how their work fits into the wider, global aspects of the company, so that they can benefit from seeking international postings, secondments to other divisions, and membership of international project teams.

If these responses are the key meanings of commitment for engineers, then when women engineers' commitment is evaluated by their mostly male managers, it seems possible that it is against a different range of criteria to those meanings given by the women. Further research is needed to obtain an understanding of the importance to engineers of the full range of the commitment features identified in this study in relation to their individual and perceived organisational meanings of commitment. Further research is also needed to ascertain how those meanings are used in the signalling and appraisal of commitment, and whether the outcomes are the same for men and women.

CONCLUSION

The evidence suggests that gender and managerial level do moderate meanings of commitment held by engineering managers, and that whilst there are many similarities, there are some important differences.

Data have been presented to show the shift of emphasis in meaning from the management research literature's earlier conceptualisation of commitment. That focused on job retention and loyalty to the organisation, together with internalisation of the organisational goals and values, and willingness to exert effort on the organisation's behalf. There seems to be a move towards a much more active, challenging and innovative composite commitment to the work, the organisation and the personal career, as indicated by this evidence particularly from senior engineering management, dropping the desirability of continuance commitment. As well as providing empirical evidence on the link between commitment, gender and career development, the study indicates outcomes for managerial practice. Women engineers may benefit by better understanding these managerial meanings of commitment, often previously shrouded in words such as "gut feel". By being aware of gender differences and managing to utilise the strengths from both men and women's commitment, engineering organisations may be able to turn these changes in commitment to value added and competitive advantage for both employer and employee.

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