The effect of motivation on publication productivity of UK LIS academics

Serena Ellerslie and Charles Oppenheim

Abstract

The research investigates whether a relationship exists between motivation and publication productivity of UK academic Information Scientists. A motivational questionnaire survey was performed, and citation analyses undertaken to determine the publication and citation count of the 45 respondents. Findings demonstrate significant differences in motivational levels and publication counts by age, gender, caring responsibilities and hours spent on research. The paper concludes that those likely to produce more publications were older males without responsibilities who did 6-15 hours research per week. The significance of the findings to employers are discussed and areas for further research are suggested.

1 Introduction

Psychologists are intrigued by human motivation and many of the motivational theories developed in the last century are applicable today (Osteraker, 1999). Use of the theories has enabled us to understand the link between motivation and job satisfaction, productivity, leadership styles, and personal characteristics. The focus of this research was to investigate whether a relationship exists between motivation and publication productivity of UK academic Information Scientists.

1.1 Defining motivation and examining theories

A simple definition of motivation is that which 'makes […people…] put real effort and energy into what they do' (Simpson, 1989, 2). Psychologists have been exploring how to motivate employees since early in the last century and a lot of knowledge on human motivation has been developed and widely applied. It should be noted that job satisfaction is closely associated with motivation, but

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they are separate concepts. Two of the most important motivational theories are described below.

1.2 Herzberg's Motivation-Hygiene Theory

The foundation of Herzberg's Motivation-Hygiene Theory, also known as the '2-factor' theory (Herzberg et al., 1959), is that people have 'two sets of needs: [their] need as an animal to avoid pain and [their] need as a human to grow psychologically' (Herzberg, 1968, 71). In his original research, 200 engineers and accountants participated in interviews discussing the positive and negative facets of their jobs and work-related experiences. Based on the results, Herzberg identified the 'motivator factor' and 'hygiene factor' as determinants of an employee's satisfaction and motivation. The motivator factor can be broken into five motivators, which 'are effective in motivating the individual to superior performance' (Herzberg, 1968, 74). These motivators are: achievement, recognition for achievement, interest in the task, responsibility for enlarged task, and growth and advancement to higher-level tasks. The hygiene factor relates to baser-level needs such as security and pay. The original experiment has been repeated with a broad range of worker types, including scientists and professionals, and all the results are consistent with the original findings (Herzberg, 1968). It is worth noting that the 2-factor theory was originally only applied to manual workers (Mullins, 2002).

1.3 Maslow's self-actualising model

Maslow proposed a hierarchy of human needs comprising lower tier primary needs through to upper tier higher order needs (Maslow, 1943). Beginning at the bottom of the hierarchy, once a need is satisfied, it ceases to be a motivating driver. People's needs are ever-changing within departments, organisations and cultures (Osteraker, 1999) and the rigid application of the hierarchy of need does not recognise that a person's needs can change daily and be at more than one level at any one time (Mullins, 2002).

Rowley (1996) investigated the issues that impact the motivation of academic staff in higher education and concluded that, 'strategies which support self-actualization and growth are strong contenders'. Stremple (1999) similarly argues that 'motivation for knowledge workers might accord closely with the apex of Maslow's hierarchy of needs'.

1.4 Motivation of academics

Despite the many theories on what motivates individuals, it is long established that there is no single way to motivate employees (Amar, 2004). However, how applicable are these motivational theories to the academic workforce? The work environment of an academic is very different to that of an industrial or manual worker. An academic is a 'knowledge worker', a termed coined by Drucker in the 1950s meaning a 'person who is involved in the collation, organization, evaluation, distribution or storage of information in any form' (Keenan and Johnston, 2000). For this reason, previous studies that measure motivation and address the impact on productivity can either not be replicated or would not apply to the knowledge working environment, e.g., Elton Mayo's 1920s famous

experiment of factory workers, and the 'Hawthorne effect' (Mayo, 1947). Hui-Chun and Miller (2005, 40) state:

…knowledge workers do not see themselves as subordinates or employees and cannot be managed in what was previously regarded as a Theory X or Theory Y way. Knowledge workers see themselves more as "associates" of the organisation rather than "employees".

This suggests that knowledge workers need to collaborate more with their leaders rather than be managed by them. Furthermore, the personality and motivational characteristics of academics are unique: compared to industry professionals of the same discipline, academics are more artistic and motivated to achieve a high status in their jobs and by the opportunity to contribute to their field (Erez and Scheorson, 1980). Employees are intrinsically motivated and extrinsically motivated, and in the knowledge working environment where it is necessary to share tacit knowledge, 'intrinsic motivation is crucial' (Osterloh and Frey, 2000, 538). Despite these arguments, there are good reasons to assess whether components of motivational theories do apply to academics.

1.5 Generational issues

There is an increasing amount of literature on the characteristics and personalities of the generations in the workforce (Hui-Chun and Miller, 2005; Wallace, 2001; Loughlin and Barling, 2001). It was anticipated that the participants of this research will either be 'baby-boomers' born between the years of 1946 – 1964, or of 'Generation X' born between the years of 1965 - 1981. Each generation has a different set of motivators, and the work values, attitudes, expectations, needs and behaviour between the generations vary greatly. This has a significant impact on how they respond and are motivated by leadership styles. There is evidence, for example, that baby-boomers prefer authority, whilst Generation Xers choose flexibility and freedom (Hui-Chun and Miller, 2005).

A study by Amar (1998) argues that control can reduce motivation and that 'any control that employees find hindering their functioning should be considered unfit for anyone in an innovation organization'. This is also supported by Stremple (1999).

Thus, in order to drive motivation and increase the satisfaction of knowledge workers, the emphasis is on collaborative leadership in an environment where employees can make a difference and feel that their ideas count (Messmer, 2001). Amar elaborated:

…developing a new understanding of human motivation at work without giving meaningful consideration to generations X and Y would not result in a durable theory of knowledge worker motivation.

(Amar, 2004, 92)

Despite the fact that some well- established theories may not seem wholly suitable as the basis for measurement in today's workplace, the frequent application of these theories supported their use in this study.

1.6 Applications of motivational theory and the effect on productivity

It is a truism that employees are an organisation's most valuable assets. This highlights the importance of understanding the theory and application of motivation to manage human resources (Amar, 2004). This is particularly significant in knowledge work environments, where the most valuable knowledge is 'embedded in the minds of employees' (Hauschild et al., 2001).

Edem and Lawal (1999) studied job satisfaction and publication output among librarians in Nigerian universities. They tested Drucker's hypothesis (1972) that 'happy workers are efficient and productive'. The method comprised a modified version of the MSQ (Minnesota Satisfaction Questionnaire) that was completed by 202 librarians. However, there was no description of how publication output was measured. The results imply that achievement, responsibility and recognition significantly influence publication output, and that salary, and university policies and administration have no influence. Such results are closely linked to Herzberg's motivator and hygiene factors and provide support for application of his theory.

There is limited published literature to date on the relationship between motivation and productivity in Library and Information Science. There is also a limited amount of study within the UK. Considering the impact of culture on job satisfaction and expectations (Lacy et al., 1997), it can reasonably be assumed that the results may be different in the UK to Nigeria.

2 Research methods

In order to study the effect of motivation on publication productivity amongst the target population, a two-pronged methodology was adopted. First it was necessary to gauge the motivation levels of LIS academics, and secondly to measure their publication output in terms of both quality and quantity.

2.1 Measuring motivation

To measure the motivation levels of UK LIS academics, an online questionnaire was designed based on Herzberg's 'motivational-hygiene theory' and Maslow's self-actualisation model. The survey consisted of 15 questions, eight relating to demographics, five relating to motivation, two to views on work ethic and scholarly publishing in LIS, and the last relating to job satisfaction level. The seemingly large number of demographic questions were included to ascertain the influence of such on motivation and/or publication productivity. The survey was piloted on academics in the Department of Information Science at Loughborough University and a number of changes made as a result.

Potential participants were identified by recording the details of universities offering accredited LIS courses from the Chartered Institute of Library and Information Professionals (CILIP) website. The website of each university department/faculty website was then accessed to discover the email addresses of suitable potential participants.

There were 17 universities that offer CILIP accredited courses. Eight universities were excluded either because of technical difficulties in accessing the required information, or because the information simply was not freely available on the internet. In total, a target population of 194 academics was identified from the remaining nine universities. The questionnaire was emailed to this group with a covering letter explaining the research and the necessity of some of the more personal data it required. Thus, the sample was a convenience sample taken from UK academics in one particular subject area – Library and Information management.

45 people responded to the questionnaire (23.2% of the total identified potential participants). They typically responded within two weeks. All the completed questionnaires were valid. It is, of course, likely, that those who responded were particularly interested in the topic and were, arguably, more motivated individuals, so the results should be treated as indicative rather than conclusive.

2.2 Measuring research output

Having gathered motivational information from 45 LIS academics, it was then necessary to measure their publication productivity.

The research output of a given author can be measured both in terms of quantity and quality. The quality of publications is important in academic evaluation to assist decision making for tenure and funding. Although there is no definitive measure of quality, there are many well-established bibliometric methods that are used as a surrogate for quality, most notably citation counting.

2.2.1 Measuring quantity using publication counts

The quantity of research productivity can be measured as number of published pages in journals (Malhotra and Kher, 1996; Hoverstad 1991, cited by Babber et al., 2000), as number of articles published (Stahl et al., 1988; Hadjinicola and Soteriou, 2006); or through a combination of both methods (Grover et al., 1992; Babber et al., 2000). Such studies that have used a combination of both methods have aimed to rank institutions as well as individuals based on their research output. Such a combination was beyond the capacity of this project, so we focused on the number of articles.

2.2.2 Measuring quality using citation analysis

Citation analysis is widely used for evaluation of research quality (Baird and Oppenheim, 1994). It is commonly employed to rank journals and universities (Cronin and Barsky Atkins, 2000), and to measure the quality of research (Cole, 1971).

Garfield (1979, 63) reminds us that ‘the nature of the quality that citation rates measure is elusive’. Citation rates could be inflated by self-citations and ‘inbreeding’ (Garfield, 1979, 63), or could be the response to a poor paper that is being repeatedly discredited, and for some disciplines ‘when scientists cannot agree upon what high quality is, their concern is likely to be with quantity of output’ (Cole, 1971). Nonetheless, citation studies are generally considered to be robust measures of research quality.

Use of the *h-index* has led to the evaluation of individuals using citation analysis (Oppenheim, 2007). The *h-index* is designed to improve upon the 'simple' measures of citation counts and publication counts by a formula based on the total number of citations per article. It should only be used when applied to authors within the same field (Hirsch, 2005). The aim of the *h-index* is to distinguish influential authors from authors who produce a lot of papers. An author, who has an *h-index* of n, has n papers that have received at least n citations. The main criticism of the measure is that scientists with a short career are at an inherent disadvantage because their *h-index* value is limited by their number of publications regardless of the importance of their research (Bornmann and Daniel, 2007).

For the purposes of this project, the quantity of publications was the focus, although a measure of quality using the *h-index* was also made.

2.2.3 Collecting publication history

To gather publication data on each participant, an author search on *Library and Information Science Abstracts* (LISA) was conducted. LISA was selected as the database to be searched because, despite a recent dip in coverage (Oppenheim and Duffus, 2007), it offers good coverage of scholarly LIS publications. LISA currently abstracts over 440 periodicals and is updated twice weekly. Searches were performed by surname and limited to the publication years between 2000 and 2006. Further investigations often needed to be made to ascertain that a paper identified as a hit was indeed written by the relevant academic. We did not use personal web pages as not all academics had one, and in any case it was not clear how comprehensive the publications lists on them were.

In total, 462 records were successfully returned that were identified as being produced by the 45 participants. Author, co-author, and full bibliographic details were all recorded.

2.2.4 Performing the bibliographic analysis

Once all the articles had been identified, a citation search was performed using *Web of Knowledge* to ascertain the number of citations to the identified publications. A 'Cited Reference Search' was performed for each author, for citations to their journal articles between 2000-2007. For each hit, the number and year of citations was recorded and whether they were self-cited or not.

The following bibliometric analyses were then performed:

- Citation count per article
- Citation count total per participant
- Number of self citations per article
- Total number of self-citations per participant
- Citation count minus self citations per article
- Citation count minus self-citation count total per participant
- *h-index* value.

- *h-index* value excluding self citations.

The purpose of citation, e.g., whether to credit or discredit the cited literature, was not investigated.

5 Results

5.1 Demographics

As noted earlier, 45 LIS academics responded to the questionnaire survey. The male/female ratio of responses (see Table 1) was very close to the gender ratio of target population.

	Male (%)	Female (%)
Target participants who were emailed	~63	~37
Recipients who have participated	60	40

Table 1: Male and female LIS academic participants

5.1.1 Age range of respondents

Respondents were asked to indicate to which age category they belonged: 25 and under, 26-35, 36-45, 46-55, or over 55. The percentage of participants per age category was quite evenly dispersed; the smallest age category being 26-35 years.

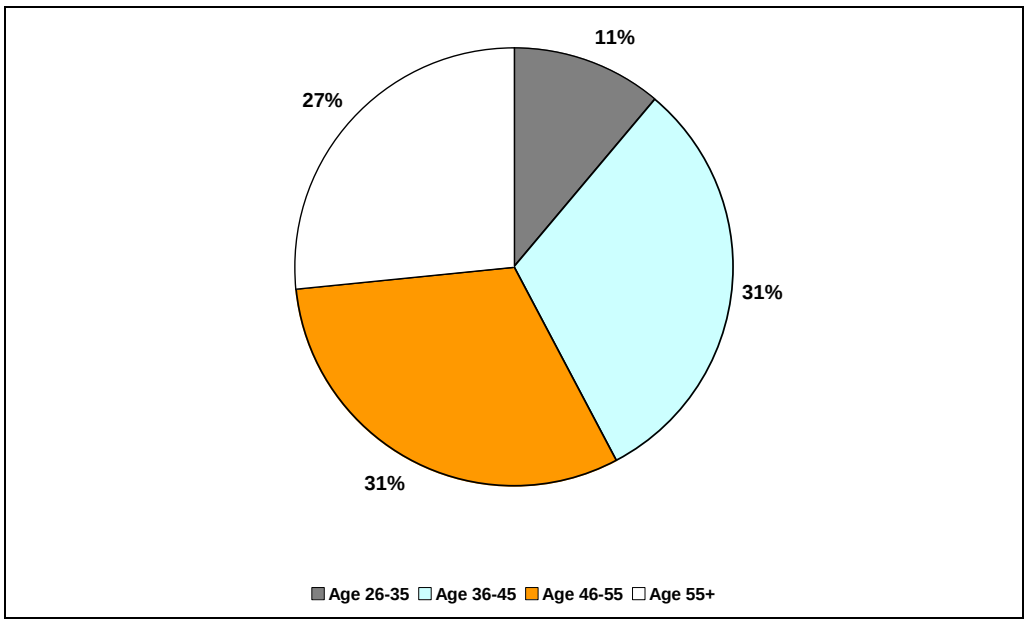

Figure 1: The ages of the participating LIS academics

The number of men and women in each age category is given in Table 2. Unfortunately, the small number of respondents in each category meant that questionnaire analysis at gender and age level would be insignificant.

Age category	Males	Females
26-35	4	1
36-45	7	7
46-55	7	7
56+	9	3

Table 2: The number of male and female participants per age category

5.1.2 Dependants

The survey asked respondents if they currently had dependants or caring responsibilities. Over half of the participants (53%) answered yes, with only one participant (female) failing to answer the question. More females (~62%) than males (~48%) had dependants or caring responsibilities.

5.1.3 Working hours (pt/ft, hours worked per week, teaching: research)

To ascertain working patterns and the extent of respondents' research focus, they were asked whether they worked part- or full-time, for how many hours per week, and how many hours were spent on teaching and research activities. About 93% of the male sample worked full-time hours; of these about 52% of male participants work 45+ hours per week. In comparison, ~72.2% of females work full-time hours, with fewer than 45% working longer than 45+ hours per week. More participants with caring responsibilities worked part-time hours (21%) than those without (5%).

44% of participants spent longer on research than teaching, whilst 36% spent more time teaching than on research. About 11% of participants spent an equal amount of time on both. There was a distinct difference by gender; considerably more males spent more hours on research than teaching, and considerably more females spent more hours on teaching than research. The ratio teaching: research (in hours) was practically opposite for each of the sexes.

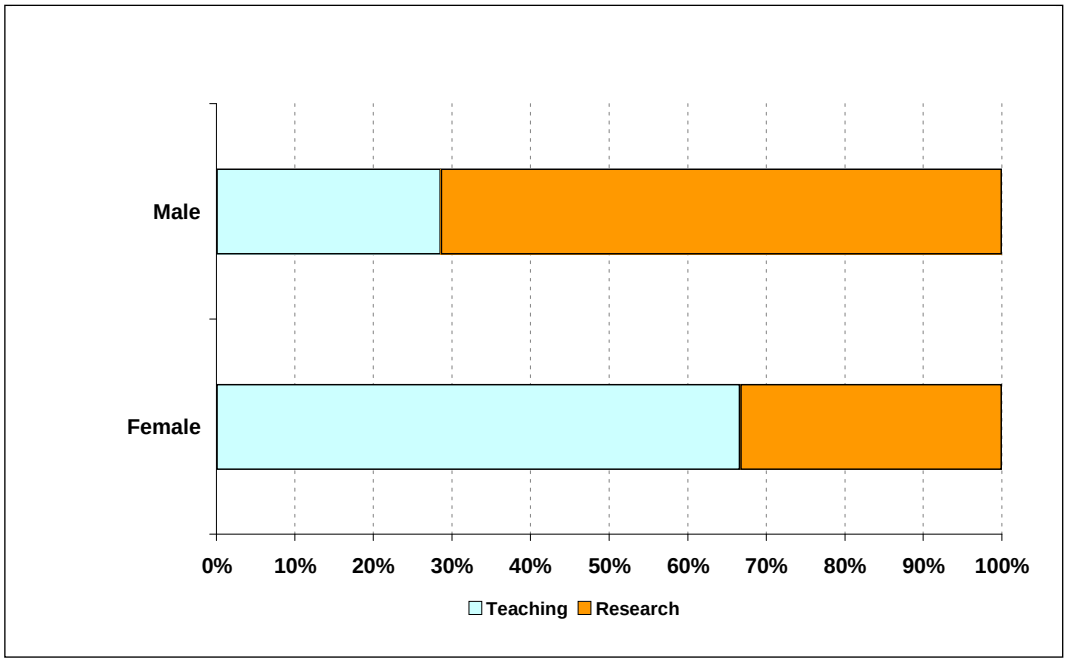

Figure 2: Hours spent on teaching or research by gender

Interestingly, in terms of hours worked, excluding the results of category '0-5 hours', there was a linear relationship between the hours spent on research and the proportion of participants with responsibilities.

0-5 hours	6-15 hours	16-25 hours	26+ hours
67%	44%	45%	70%

Table 3: The percentage of LIS academics per research category that have dependant and/or caring responsibilities

5.2 Maslow's hierarchy of needs

Using Maslow's hierarchy of needs as a model, two sets of questions were put to the LIS academics. One set asked them to indicate how important certain elements (from job security through to help with personal problems) were to them. The other set asked them to indicate the extent to which they felt those needs were being met within their workplace.

Figure 3 shows the results from four primary needs by gender.

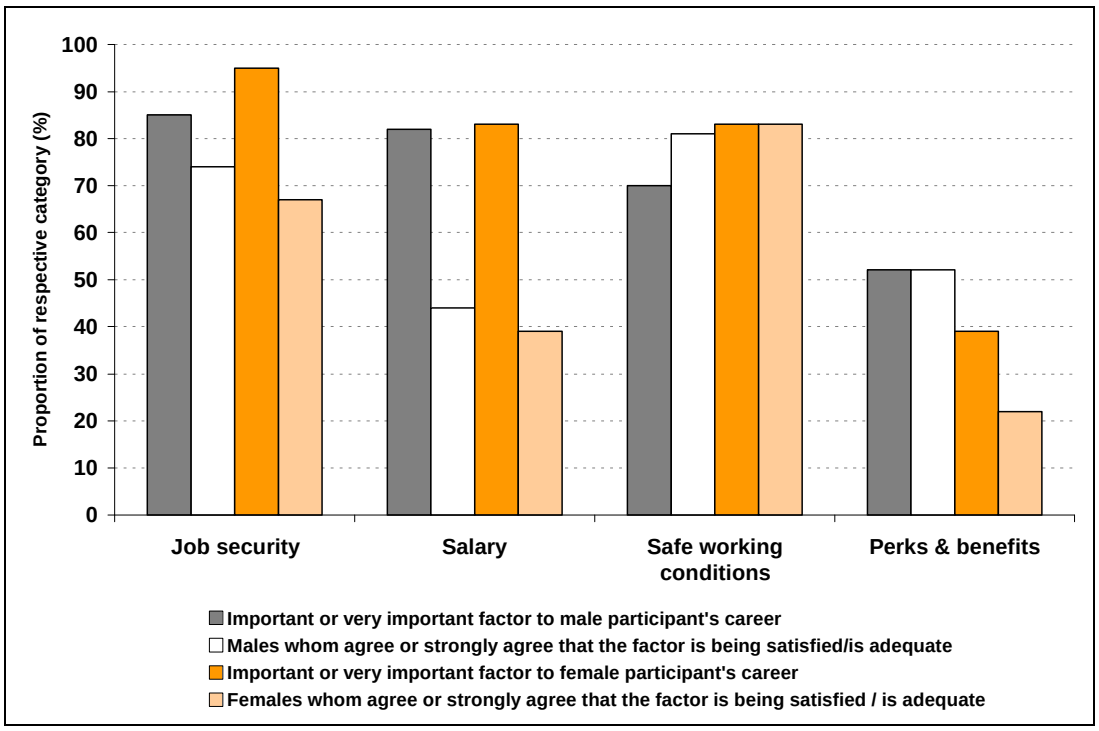

Figure 3: The importance of and experienced satisfaction of four primary needs to male and female LIS academics

For men and women, salary showed the greatest disparity between importance and satisfaction, followed by job security. There was a wider gulf in the set of results for female respondents. In terms of Maslow's hierarchy of needs, the women appeared to have fewer basic 'levels' fulfilled, which may, in turn, impact on their motivation.

5.2.1 Maslow needs by gender

Figure 4 illustrates the importance of all Maslow needs to respondents by gender and Figure 5 illustrates the perceived satisfaction of those needs. There is little difference in the order of the needs between the sexes, but the most notable was the importance of sympathetic understanding and/or help with personal problems to the careers of females. About 72% of females considered this factor important/ very important to their careers, whilst ~6% thought it was unimportant/ very unimportant. Almost conforming to stereotype, ~44% of men deemed sympathetic understanding to be important/ very important, and ~30% considered it to be unimportant/ very unimportant to their careers.

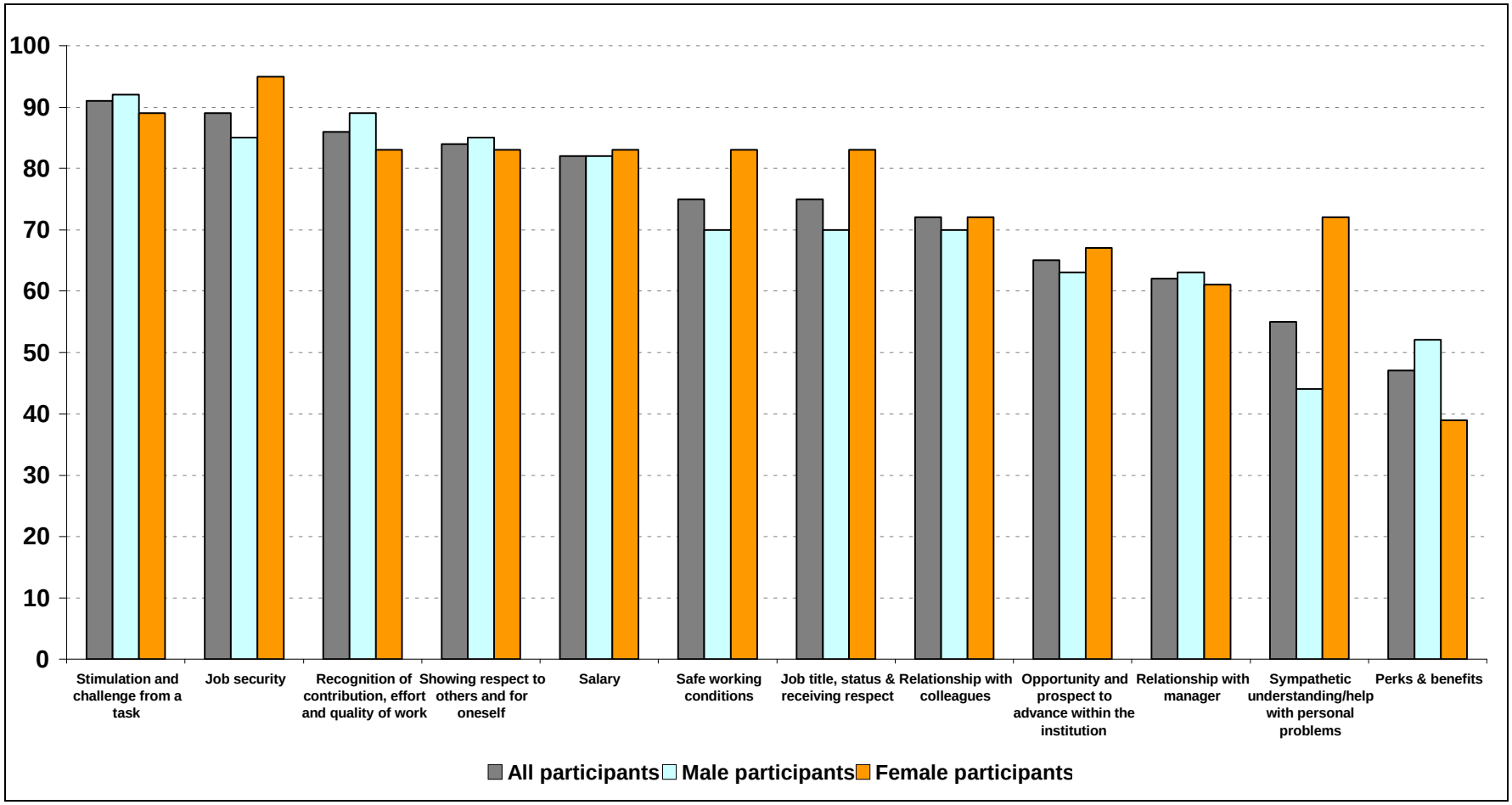

Figure 4: Needs that are important to LIS academics in general and by gender

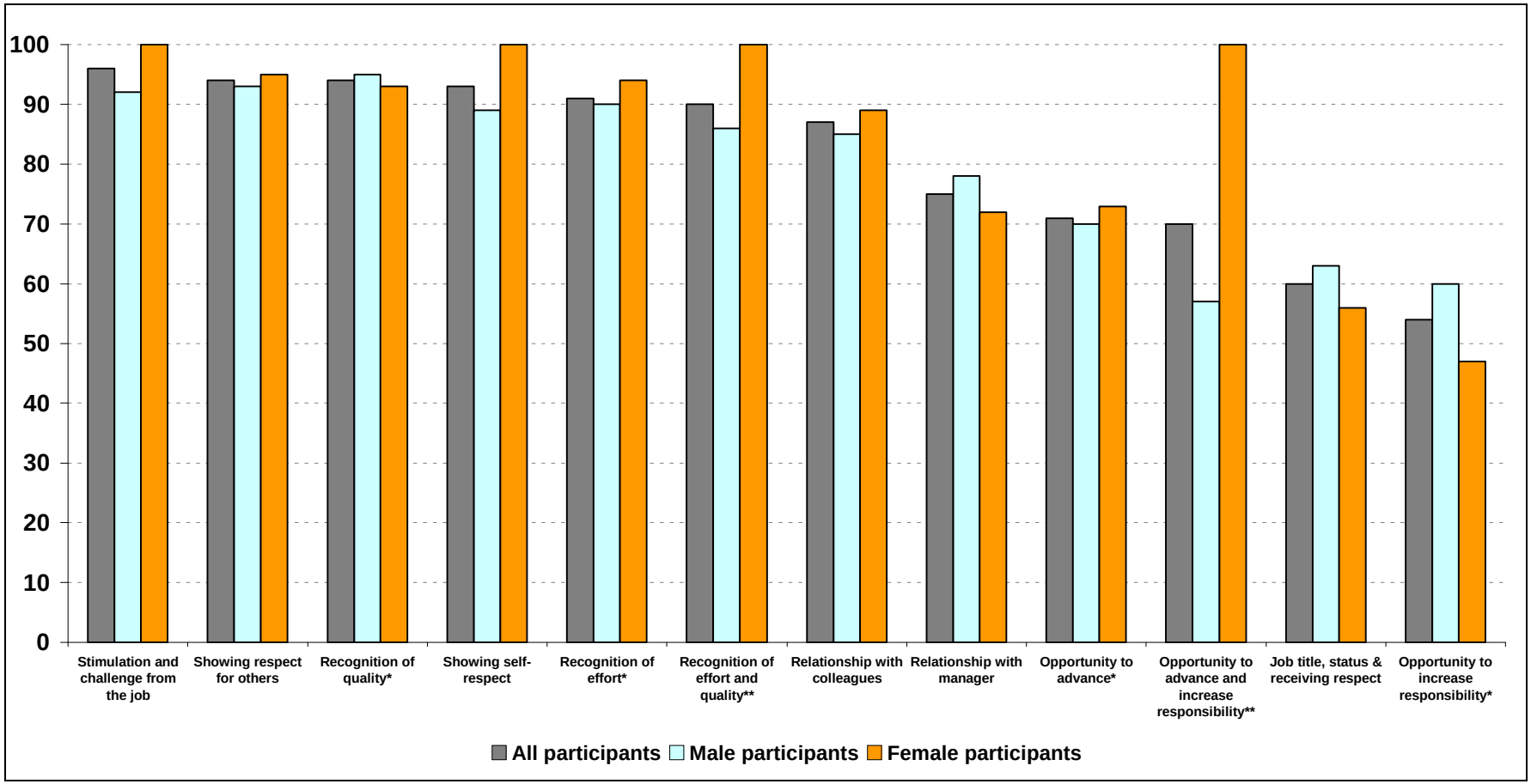

Figure 5: Needs that were perceived to be satisfied by LIS academics in general and by gender

5.3 Primary motivation (after Herzberg)

Respondents were asked to what extent they agreed with three statements based on Herzberg's 2-factor theory:

1) I am primarily motivated to work by my job role itself, e.g. the task/project, personal interest, responsibility, achievement, etc.
2) I am primarily motivated to work by external factors within the work environment, e.g., working relationships, commitment and loyalty to colleagues, salary, etc.
3) I am primarily motivated to work by external factors away from my current job, e.g., personal life, financial responsibilities, etc.

Figure 6 shows that 76% of participants agreed/ strongly agreed that they were motivated by the job role itself. However, females were significantly more motivated than males by factors within the workplace, including salary, which may explain the stark contrast in results of the 'salary factor' per gender. To a lesser extent, a source of motivation for more males than females are external factors away from the work place, i.e. personal life, which is a surprising result as traditionally men are seen to be more career driven than women.

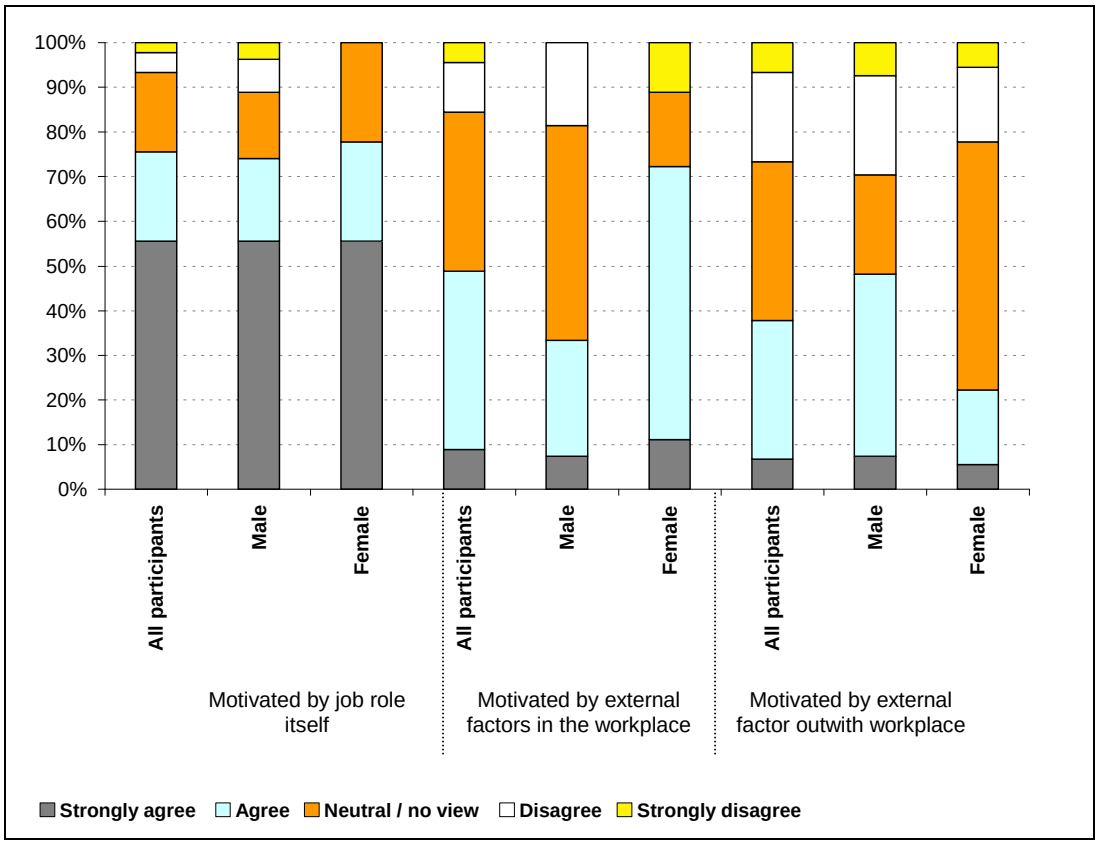

Figure 6: Sources of motivation for male and female LIS academics

5.4 Motivation and scholarly output

As well as asking academics what motivates them, they were asked about the effects of motivation on their scholarly publishing output. Six statements were offered and respondents were asked to indicate the extent to which they agreed with them. They were:

1) When I am motivated, I feel that I produce a high volume of work
2) When I am motivated, I feel that the quality of my work is of a high standard
3) Getting scholarly articles published is important to me
4) Getting publication in the popular or professional media…is important to me
5) I need to get published in order to succeed in academia
6) I get great satisfaction from seeing an article of mine published

Both sexes agreed /strongly agreed that being motivated had a positive impact on both their volume of output (~74% of males and ~89% of females agreed /strongly agreed with this statement), and on the quality of output (~93% of males and ~95% of females agreed/ strongly agreed with this statement).

Similar opinions were shared by both sexes on the importance and effect of publishing. About 74% of males and 78% of females got a high level of satisfaction from seeing an article of theirs published; 74% of males and ~78% of females strongly /very strongly believed that it is important to be published; and ~63% of males and ~78% of females strongly/ very strongly thought they need to get published in order to succeed in academia. About 48% of males and only 32% of females strongly/ very strongly agreed that it's important to get publications in the popular or professional media, but there was a broad range of answers and more males (37%) than females (~28%) also thought it was unimportant/ very unimportant.

5.5 Job satisfaction

Respondents were asked to indicate on a Likert scale from very satisfied, to very dissatisfied how satisfied and happy they were in their current job. Figure 7 shows that 62% of participants were satisfied/ very satisfied in their current job, whilst 25% were dissatisfied/ very dissatisfied. Almost twice the number of females were dissatisfied/ very dissatisfied in their current job than males, and nearly five times more males were very satisfied than females.

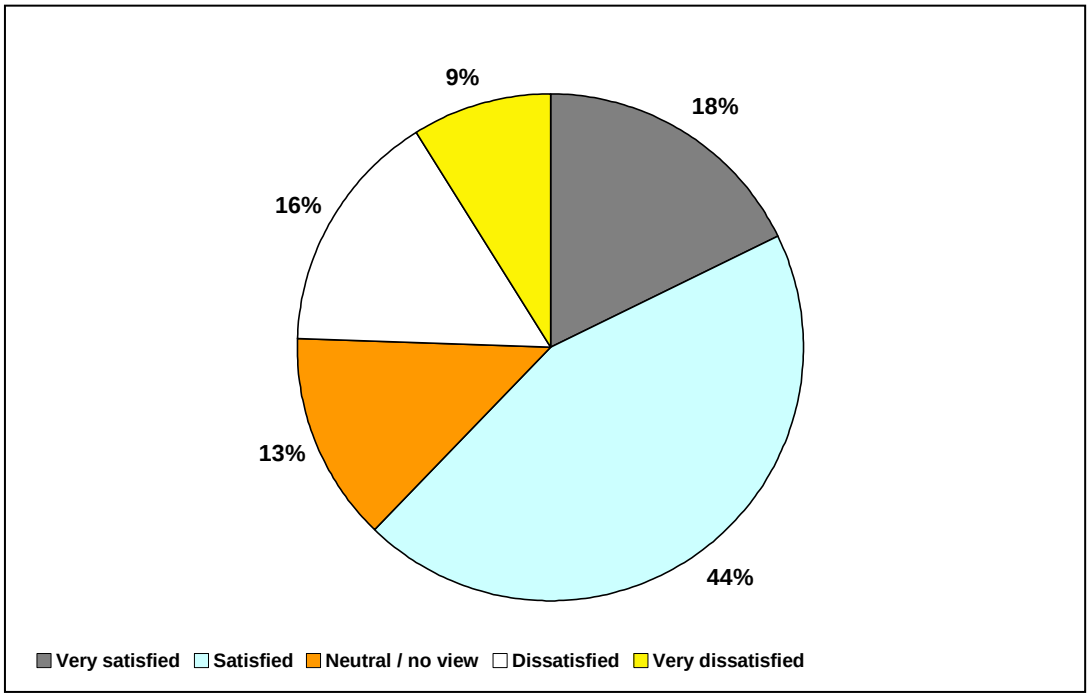

Figure 7: Job satisfaction experienced by LIS academics

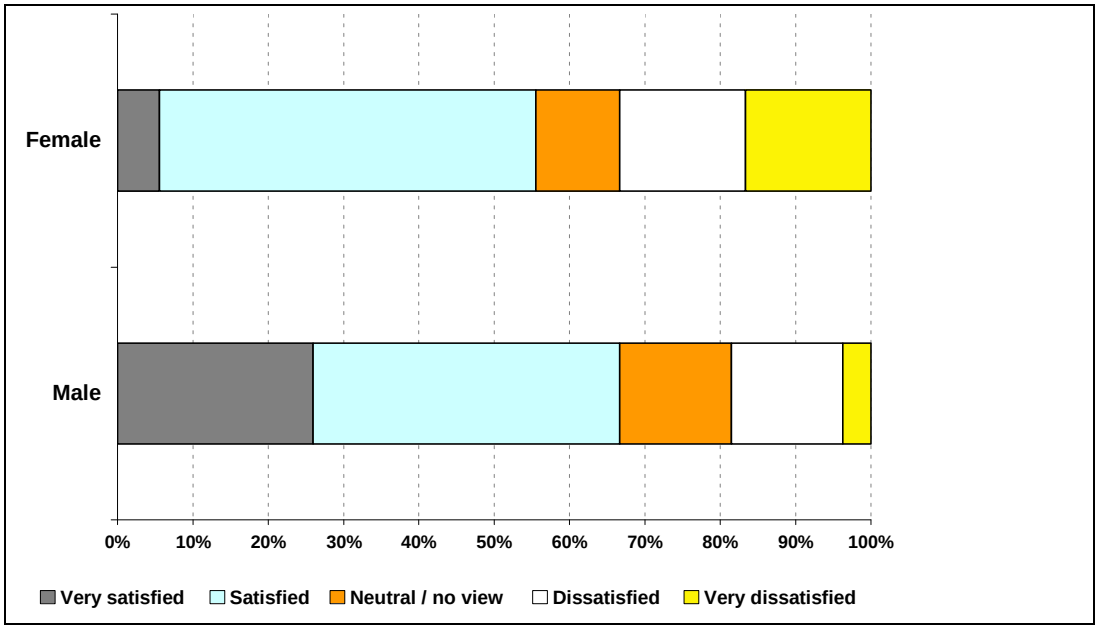

Figure 8: Job satisfaction of LIS academics by gender

5.5.1 Maslow factors and job satisfaction

A cross-tabulation was performed on the importance of the four primary Maslow needs (job security, salary, safe working conditions, and perks and benefits) to respondents compared with their job satisfaction levels. The results (Figure 9)

show that each of these factors was more important to participants who were dissatisfied/ very dissatisfied with their job, and revealed differences between the level of importance per factor and whether the factor was being satisfied/ adequately met. In stark contrast, the participants who were satisfied/ very satisfied agreed that each of these factors (bar salary) were satisfied/ adequately met.

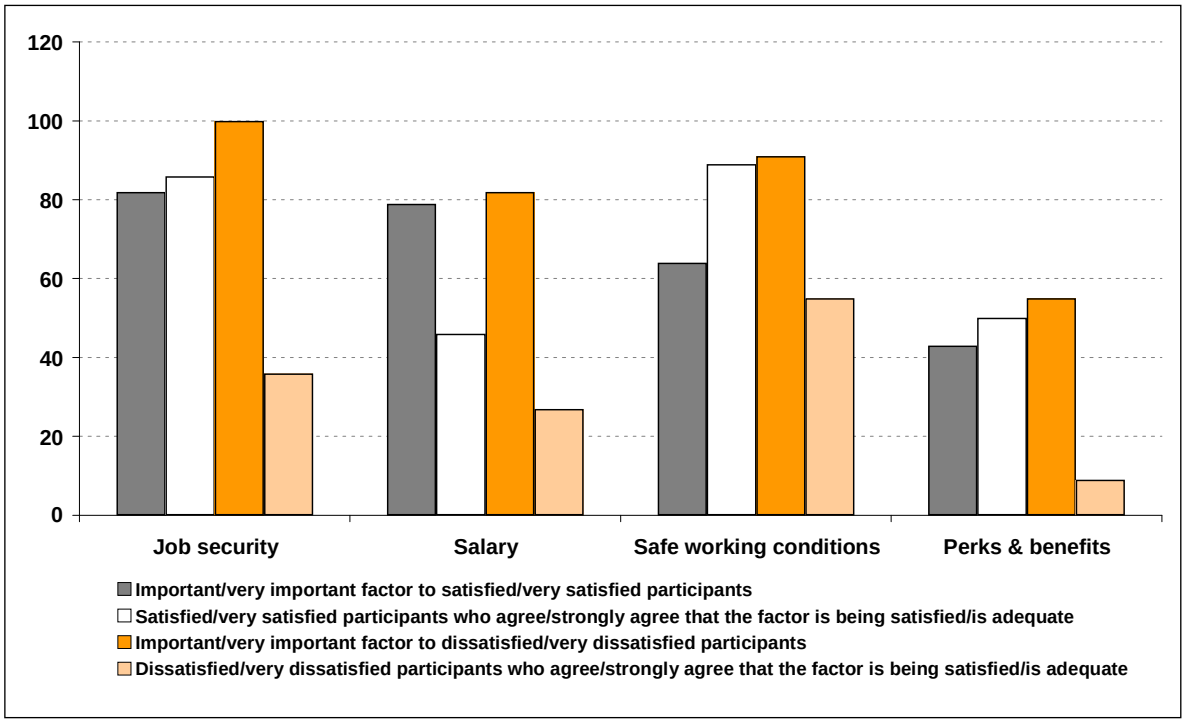

Figure 9: The importance and experienced satisfaction of four keys factors for LIS academics who are satisfied/ very satisfied and for LIS academics who are dissatisfied/ very dissatisfied.

5.5.2 Primary motivation and job satisfaction

A further cross-tabulation was performed on the source of primary motivation for respondents and their job satisfaction levels. Figure 10 shows the results. Interestingly, the predominating source of motivation for participants who were satisfied/ very satisfied was the job role itself. Whilst the job role was a source of motivation to a slightly lesser extent to participants who were dissatisfied/ very dissatisfied, they were also far more motivated by external factors outside the workplace. Of course, all such findings can be interpreted in two ways. Either the job dissatisfaction leads to motivation by factors external to the workplace, or the external sources of motivation lead to job dissatisfaction.

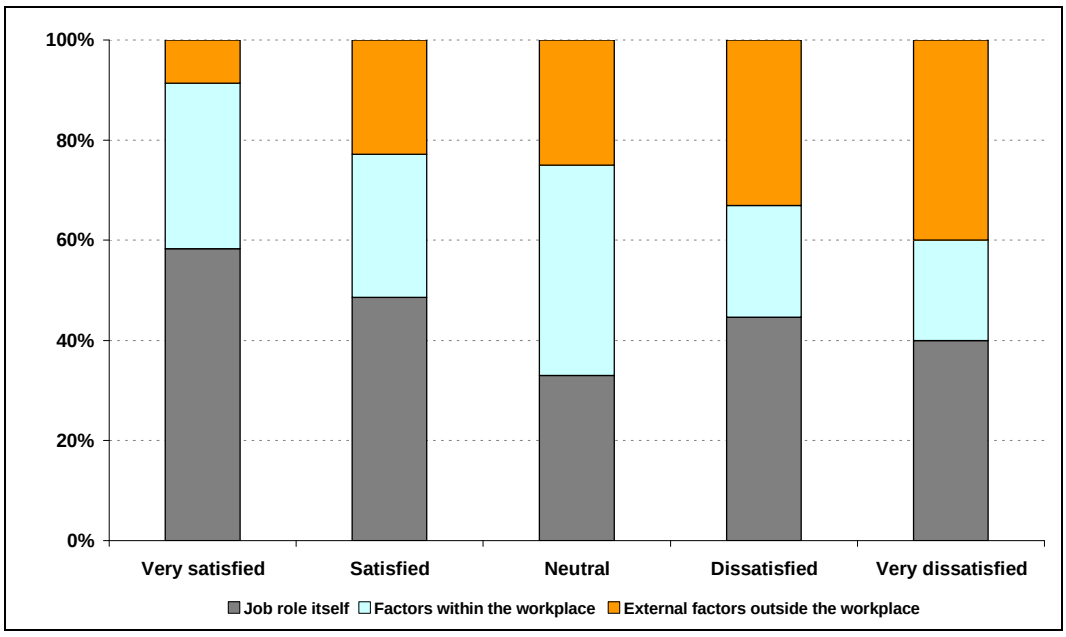

Figure 10: The sources of motivation in comparison to level of job satisfaction experienced by LIS academics

5.6 Time spent on research and motivation

Further analysis was performed to see if there was any relationship between respondents' research focus (i.e. the number of hours spent doing research and their teaching: research ratio), and their motivation and job satisfaction levels.

All participants in the different 'hours spent on research' categories believed that when they were motivated, they produced a high volume of work and high quality work. Whilst the majority of all these categories were motivated by the job role itself as opposed to external factors, it is a more commonly shared view of the participants who spend longer hours on research (Table 4).

0-5 hours	6-15 hours	16-25 hours	26+ hours
67%	74%	82%	80%

Table 4: The percentage of LIS academics per research category that are motivated by the job role itself

It could therefore be inferred that LIS academics are more motivated by job roles that allow them to do a lot of research.

5.6.1 Time spent on research and job satisfaction

It also appears that the amount of time a participant spent on research per week is connected to their level of job satisfaction. About 27% of participants who were satisfied/ very satisfied in their job, spent 26+ hours per week on research, compared with 18% of participants who were dissatisfied/ very dissatisfied.

About 11% of participants who were satisfied/ very satisfied in their job, spent 0-5 hours per week on research, compared with 27% of participants who were dissatisfied/ very dissatisfied.

5.6.2 Teaching: research ratio and job satisfaction

The teaching: research ratio for participants who were satisfied/ very satisfied was inversely proportional to participants who were dissatisfied/ very dissatisfied (see Figure 11). This again suggests that LIS academics prefer to spend more of their time on research than teaching, and that this, in turn, affects their level of job satisfaction.

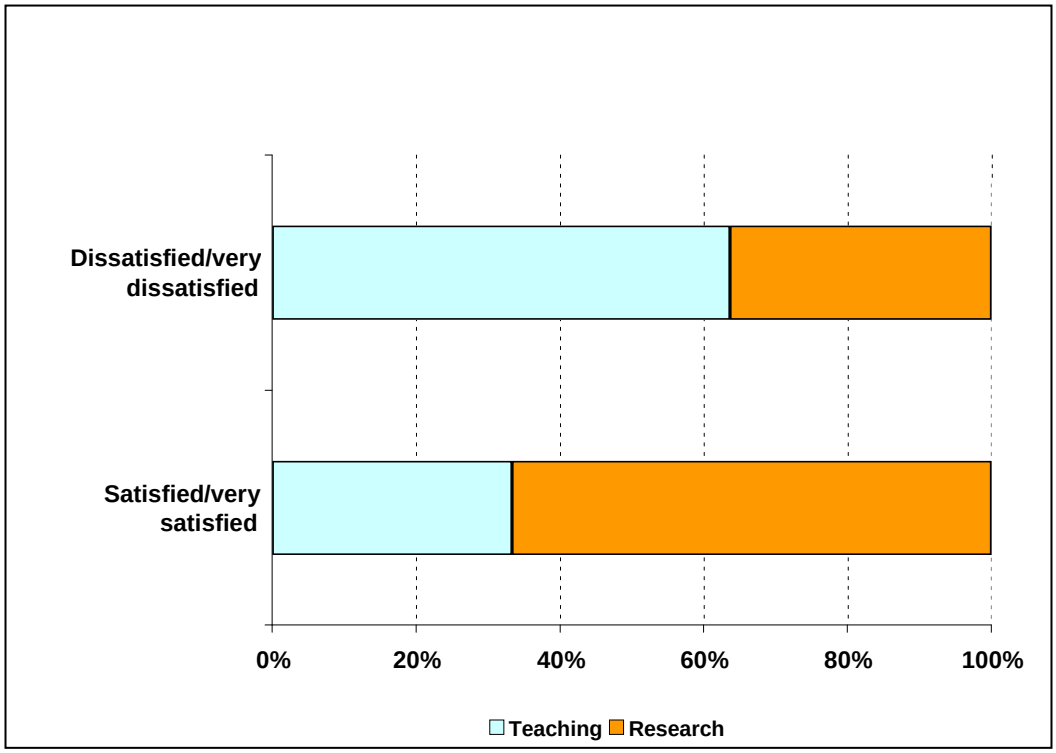

Figure 11: A comparison between levels of job satisfaction of LIS academics and on which activity, teaching or research, they spent more time

5.7 Publication count

As noted above, 462 publications were counted for the 45 respondents between 2000-2006. The average publication count was 10.3, with a range of 0-92. No published articles could be located for four respondents. The majority of LIS academics had published between one and five articles.

Authors were categorised according to their volume of publications using the figures 0-5, 6-10, 11-20, and 21+ publications. These groups were created to distinguish frequent and infrequent publishers and also to ensure that there were adequate numbers of participants per group to allow for analysis. Figure 12 illustrates the results.

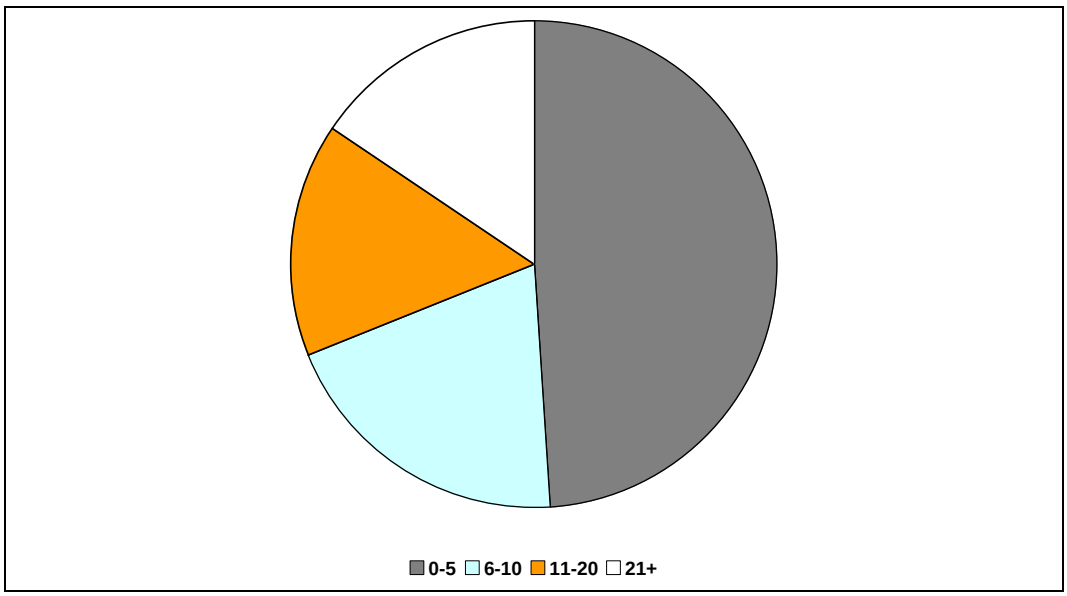

Figure 12: The number of published articles by respondents between 2000 – October 2006

5.7.1 Publication count by gender

Past studies across an array of disciplines have highlighted trends that males publish more than their female counterparts (Penas and Willett, 2006). The results of this study echo these findings (Table 5). It is unlikely that the reason is a lack of females within the sector, as LIS has been proven to attract both sexes (as illustrated by the response rate to this study). In contrast to findings by Penas and Willett (2006), a significant difference was found between the numbers of citations by gender within LIS. Interestingly, no substantial difference in self-citations between the sexes was found (Table 6).

	Male	Female
Authors	27	18
Publications	306	156
Citations	289	171
Citations excluding self-citations	229	130

Table 5: Publications by, and citations to, male and female LIS academics

	Male	Female	Overall
Mean publications per author	11.33	8.67	10.27
Mean citations per author	10.70	9.50	10.22
Mean citations excluding self-citations, per author	8.48	7.22	7.98

Table 6: Mean publications by, and citations to, male and female LIS academics

5.7.2 The h-index

Figure 13 shows the relationship between the *h-index* of LIS academics and publication counts and citation counts. There was a strong relationship between the *h-index* and publication count and citation count, plainly suggesting that if you produce more, then you are likely to be cited more.

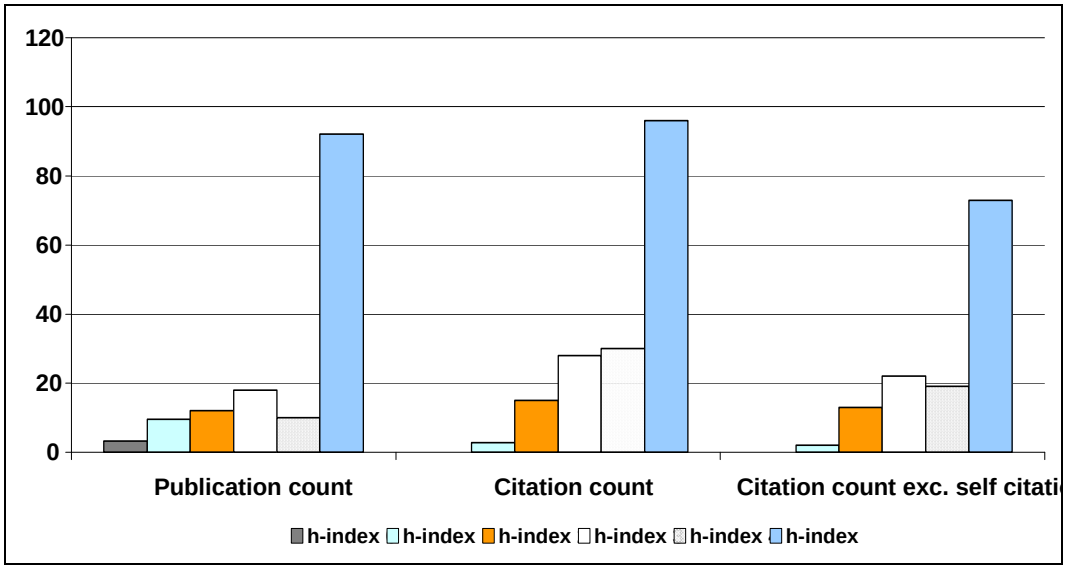

Figure 13: The relationship between the *h-index* of LIS academics and publication counts and citation counts

5.7.3 Publication count by age

Figure 14 shows the number of publications per age category of respondents. It can be seen that, not surprisingly, those in the older age categories were more likely to have published more than those in the younger age groups.

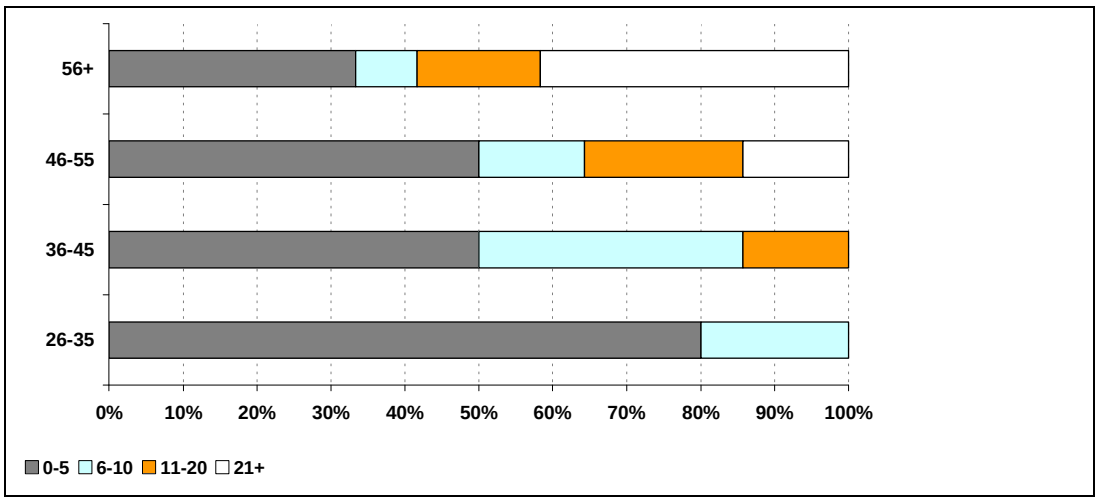

Figure 14: The number of publications produced by each age category of LIS academics

There are various factors that could explain these results. The more experienced the academic, the more established they are likely to be in their chosen field. They may therefore find it easier to obtain research funding, be involved in multiple projects simultaneously, including PhD supervision, all of which may result in a higher publication count. It may also be that some of the younger academics had been in their role for only a part of the five-year period of publication history that was analysed.

Figure 15 shows the mean publication and citation counts per age category of responding LIS academics. Again, the older the academic, the higher the publication count, and the higher the corresponding citation count.

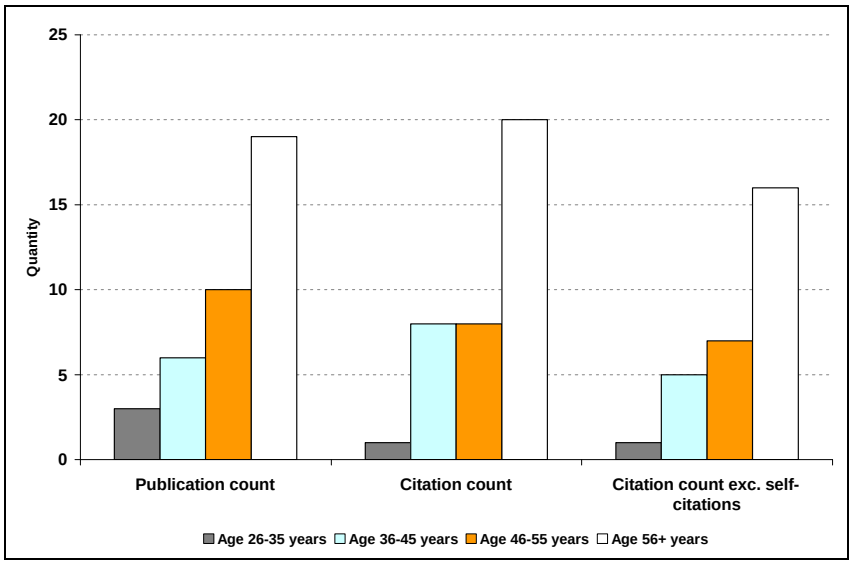

Figure 15: Mean publication and citation counts per age category of LIS academics

5.7.4 Publication count by caring responsibilities

The influence of having responsibilities is evident in the bibliometric analysis. Figure 16 shows that participants without responsibilities have a higher publication count and citation count than those that do not.

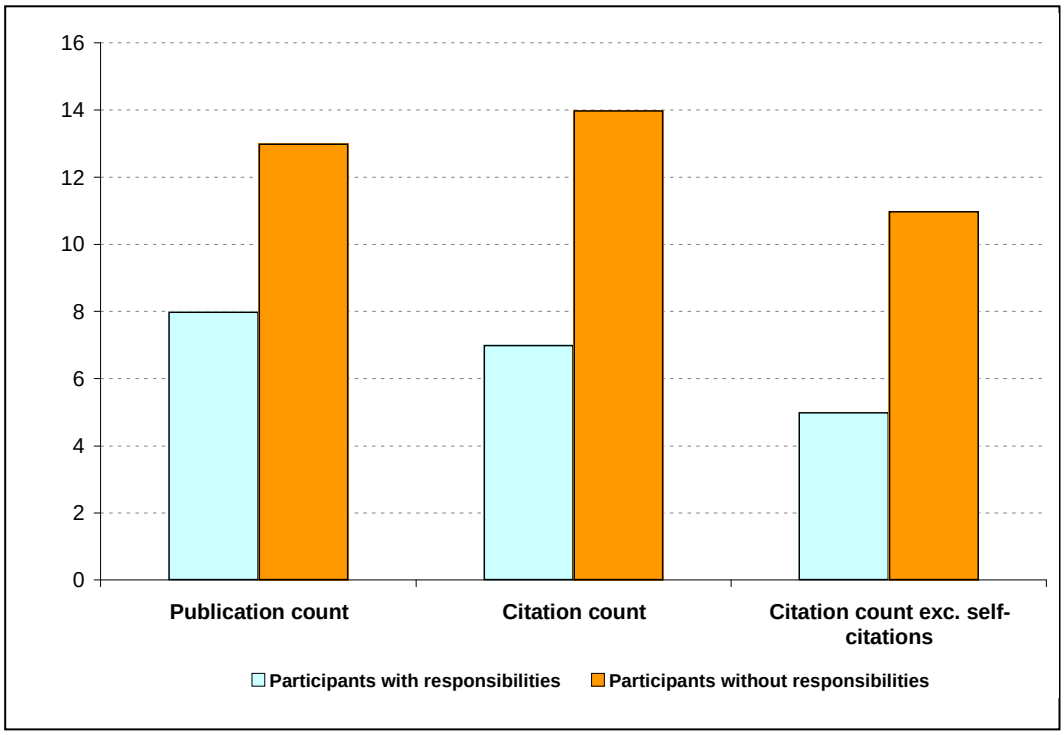

Figure 16: Mean publications by, and citations to LIS academics with and without dependant and/or caring responsibilities

5.7.5 Caring responsibilities and views on scholarly publishing

Figure 17 illustrates the views of respondents with and without responsibilities on the importance of publishing to their career. In every case, those with responsibilities showed less commitment to the concepts of: i) getting satisfaction from seeing an article published, ii) believing it was important to be published, and iii) thinking it was necessary to get published to succeed in academia.

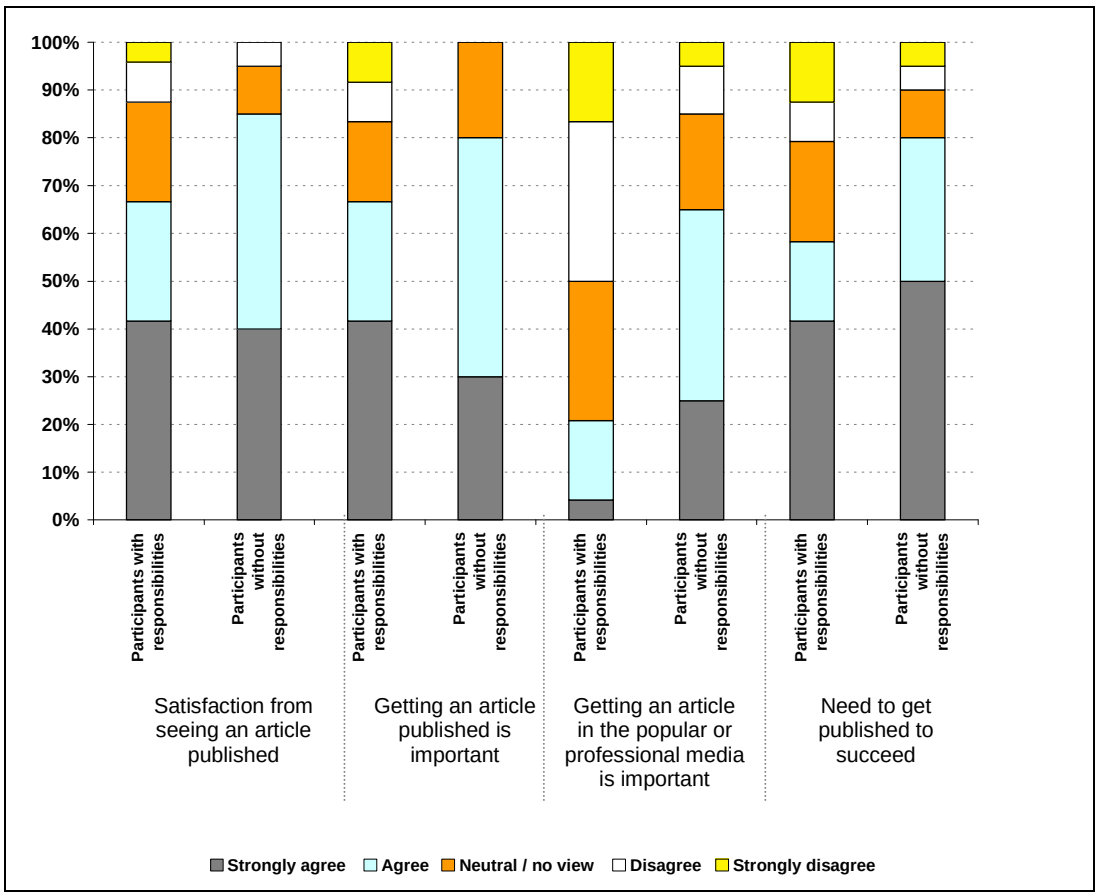

Figure 17: Views on publishing by LIS academics with and without caring responsibilities

Clearly, having responsibilities has a significant impact on the importance of scholarly publishing to an individual and therefore on the number of publications they produce.

5.7.6 Hours spent on research and publication count

Figure 18 shows the mean publications by, and citations to, LIS academics according to the number of hours they spend on research per week. Perhaps not surprisingly, those that spent fewer than 5 hours a week had significantly fewer publications and corresponding citations, than those that committed more time to research. Of greater interest was the fact that those that spent between 6-15 hours on research had far higher publication and citation counts than those that spent over 15 hours per week. It appears that there is an optimum amount of time to spend on research in order to produce the maximum number of articles. After this point productivity in terms of the quantity of articles and subsequent citations, decreases.

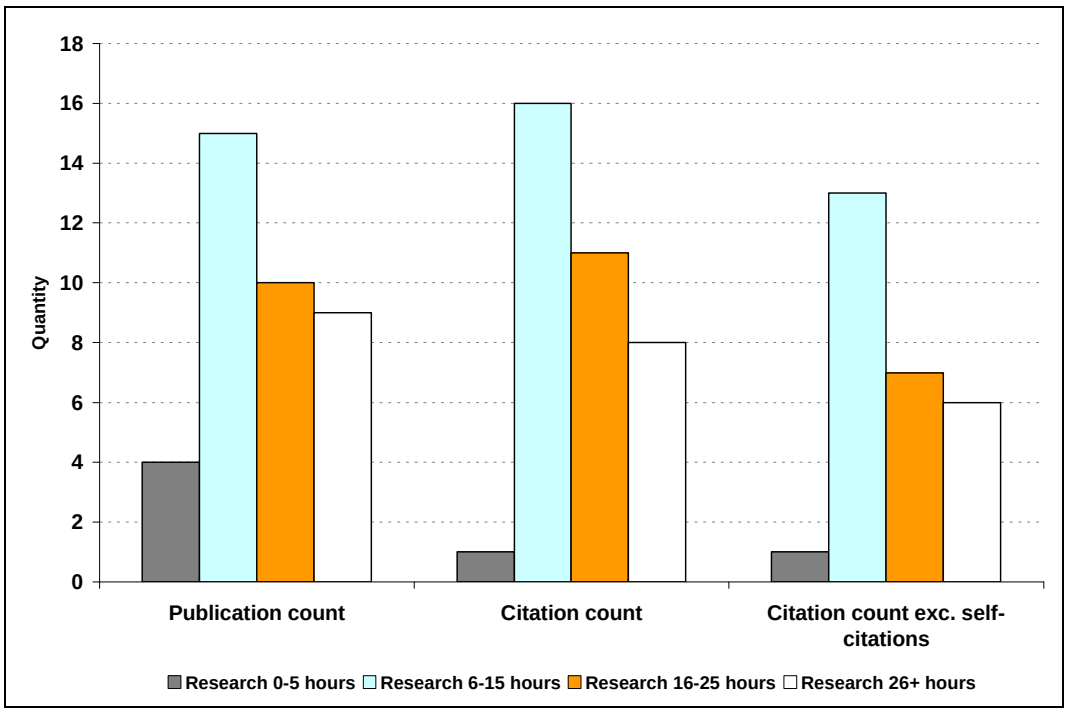

Figure 18: Mean publications by, citations to LIS academics according to the typical amount of hours devoted to research

5.7.7 Importance of Maslow needs and publication count

Figures 19-22 show the importance and experienced satisfaction of the four primary Maslow needs to respondents according to their publication output. Interestingly, participants who were the most prolific considered them of quite low importance. This may be because these motivating factors are being satisfied and are no longer a driver. They were the only group to believe that they were paid adequately for their role (Figure 22). This can also explain why participants who have produced the most also had the highest levels of job satisfaction; all were satisfied/ very satisfied (see below). The remaining LIS academics experienced shortfalls between how important they deem a factor to their career, and whether the factor is being satisfied/adequate for their role. There are two possible explanations:

- LIS academics who are proven to be productive are offered greater job security, salary and perks and benefits. Therefore, these factors have become less of a consideration and probably less important to their careers;
- Or LIS academics who are most prolific have a trait that means they place less emphasis on the importance of these factors, so they are easily satisfied

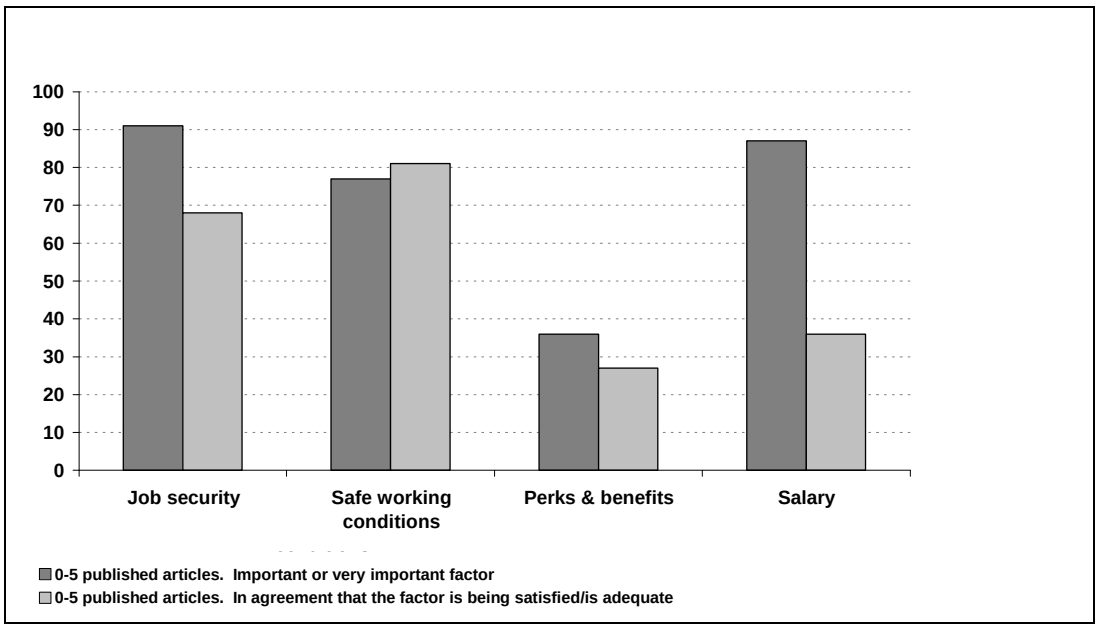

Figure 19: The importance and experienced satisfaction of four key factors to LIS academics that have published 0-5 articles

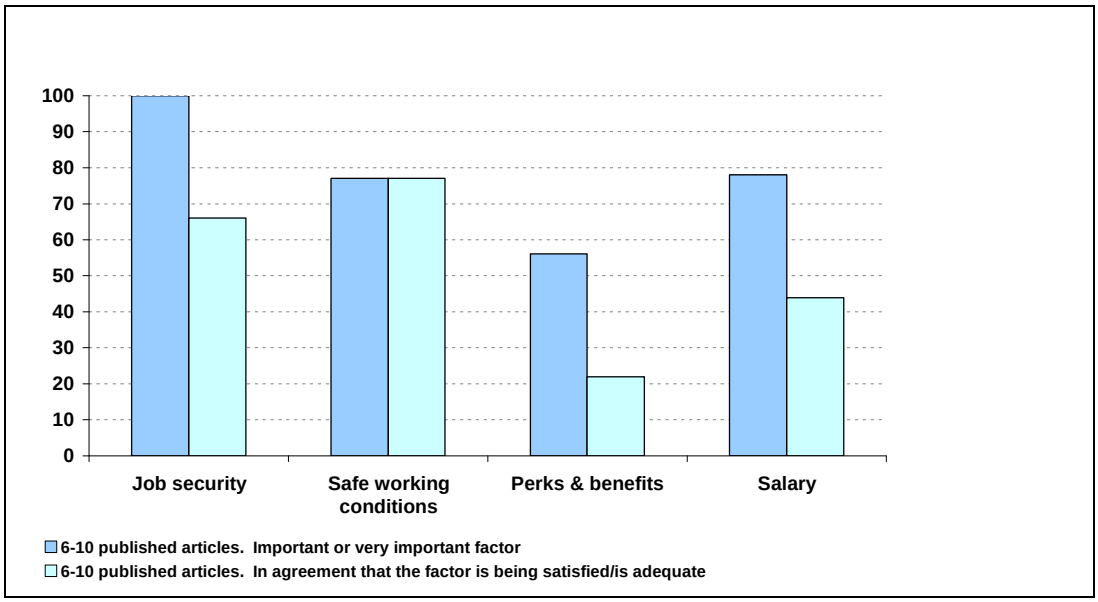

Figure 20: The importance and experienced satisfaction of four key factors to LIS academics that have published 6-10 articles

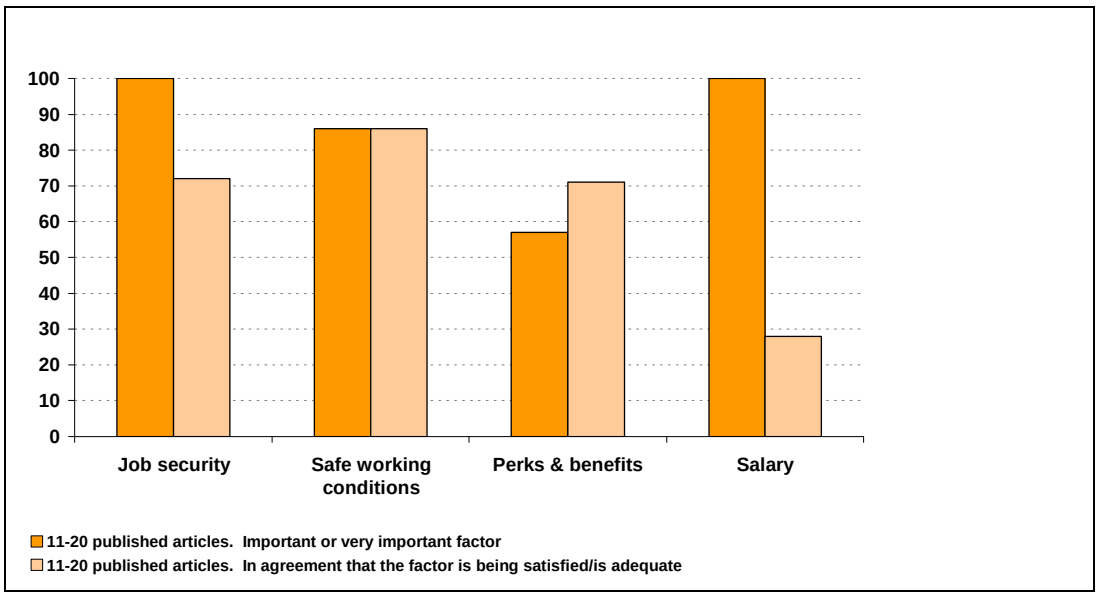

Figure 21: The importance and experienced satisfaction of four key factors to LIS academics that have published 11-20 articles

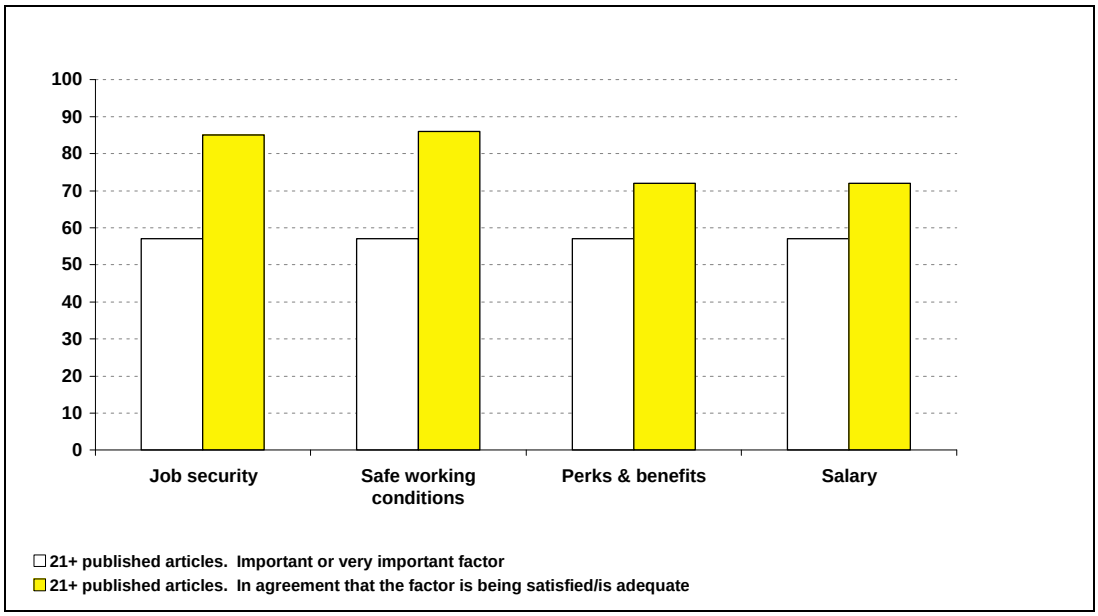

Figure 22: The importance and experienced satisfaction of four key factors to LIS academics that have published 21+ articles

5.7.8 Primary motivation and publication count

The results also reveal that participants who were motivated by the job role itself produced higher quantities of publications that were more highly cited than others.

	Publication count	**Citation count**	**Citation count exc. self citations**
Job role itself	11	12	9
Factors within the workplace	7	8	6
External factors outside the workplace	7	8	7

Table 7: The mean publications counts of, and citations to LIS academics per source of motivation

5.7.9 Job satisfaction and publication count

A correlation was found between publication counts and level of job satisfaction. LIS academics who were satisfied/ very satisfied produced distinctly more than LIS academics who were dissatisfied/ very dissatisfied. There was also a strong correlation between job satisfaction and quality of publications; LIS academics who were very satisfied received the most citations, those who were satisfied were the second group most cited, and so on. It is significant that no publications of the 9% of LIS academics who were very dissatisfied have received citations. This relationship still exists when self-citations were excluded.

5.7.10 Job satisfaction and h-index

The *h-index* is intended to be a robust measure of an author's influence because it considers the distribution of citations across the range of an author's publications. LIS academics who were very dissatisfied or dissatisfied have an average *h-index* of 0.3 and 0.4 respectively. In contrast, LIS academics who were very satisfied or satisfied had a mean *h-index* of 1.8 and 1.4 respectively. These results support the claim that job satisfaction influenced both the quantity and quality of publications by LIS academics. However, it could also be that LIS academics have higher job satisfaction because they receive many citations.

Figure 23: Mean publications by, citations to, and *h-index* values of, LIS academics according to their level of job satisfaction.

5.7.11 Age, job satisfaction and publication count

Based on the linear relationship with age and publication and citations counts, and job satisfaction, publication and citation counts, one can hypothesise that there is a linear relationship between age and job satisfaction. LIS academics in the age group 56+ years did have the highest levels of job satisfaction, and about 83% were satisfied/ very satisfied. However, if this age category is excluded from the analysis, there is an inverse relationship between age and job satisfaction.

Age category	**Satisfied/ very satisfied**	**Dissatisfied/ very dissatisfied**
26-35	60%	20%
36-45	64%	21%
46-55	42%	42%
56+	83%	8%

Table 8: The level of job satisfaction of LIS academics per age group

However, there was little variation amongst those with high and low levels of job satisfaction in their belief that motivation had a positive impact on producing greater quantity and quality of publications.

5.7.12 Overall effect of demographics and motivation on productivity

Using all the demographic and motivational data gathered, it was possible to identify the productivity levels of LIS academics falling into various categories. The results are shown in Figure 24.

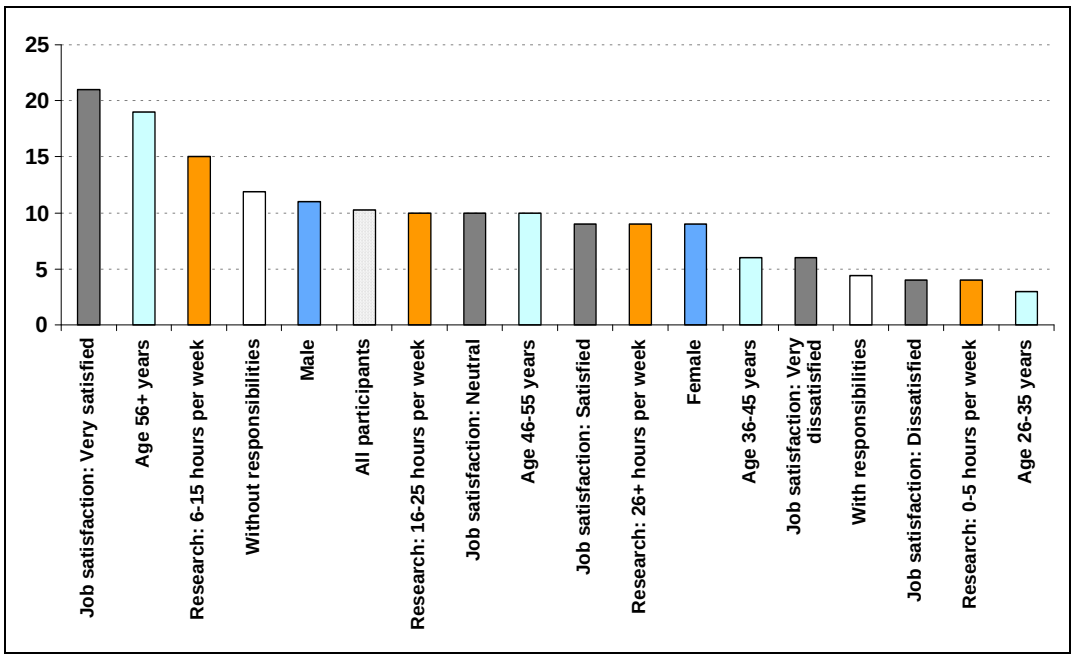

Figure 24: Predicting the publication count of LIS academics that have been identified and analysed

It can be seen that older males without responsibilities who did 6-15 hours research per week have the highest publication productivity levels. As there was a direct relationship between the number of publications an author produced and the number of citations that they receive, it is not surprisingly that the effect of demographics and motivation on citation levels was very similar.

6 Discussion

The aim of this study was to investigate whether a relationship between the motivation of academics in the study of LIS and their publication contribution exists. The majority of LIS academics believed that motivation did have a positive impact on their productivity, in terms of quantity and quality of output. The relationship between motivation and productivity is more substantial than simply a psychological connection. The research shows that LIS academics who were highly motivated were the most prolific publishers who received the highest number of citations. This study confirms the strong correlation between motivation and publication productivity and contribution. This does not imply there is a causal link between the two; it could be that there is something else at work – perhaps "intellectual curiosity" – which encourages both motivation and writing for publication.

Although the research was not primarily interested in the relationship between demographics and motivation and productivity levels, some interesting findings related to demographics.

6.1 Gender differences

Women were mainly motivated by other factors in the workplace – not by job role itself – and had fewer "primary needs" met at work. Women were also more dissatisfied in their job than men, and perhaps as a consequence, published less and were cited less.

6.2 Age differences

The research indicated that the older generation were more productive than their younger colleagues. However, research in other fields has suggested that research productivity declines with age (Over, 1982; Over, 1988), and that there is a negative association between age and scientific productivity and creativity (Cole, 1979). There are possible explanations for these results. In this research, the older you were, the greater your job satisfaction. Perhaps it was job satisfaction rather than age that affected productivity. In any case, this study may not have included sufficient numbers of participants within each age category to draw strong conclusions.

6.3 Caring responsibilities

Those with no dependants spent more hours on research, and consequently had higher publication counts than their colleagues with caring responsibilities. Those with dependants were far less interested in scholarly publishing for its own sake, had less satisfaction from seeing an article published, saw the publication of an article as less important and felt less need to get published in order to succeed.

6.4 Hours spent on research

The results clearly indicate that those that spent more hours on research were mostly those that were motivated by their job role, and had greater job satisfaction than those spending less time on research (either because they were not motivated by their job role or because their job role did not permit it). This finding was again triangulated by the fact that the greater the research: teaching ratio, the greater the job satisfaction of respondents. Our findings have shown there was an optimum number of hours to spend on research (6-15 per week) to get maximum scholarly publication output. These findings do suggest that 'underproducing' LIS academics should be encouraged or enabled in their Departmental Work Load Models to commit between 6-15 hours a week on research activities.

6.5 Sources of motivation

The majority of LIS academics were primarily motivated by their job role rather than workplace or extra-workplace factors. Interestingly, those that were motivated by factors external to workplace had lower job satisfaction. Perhaps not surprisingly, those that were primarily motivated by the job role had a higher publication count than those with other sources of motivation.

The research also showed that having one's primary needs met at work was key to job satisfaction (Figure 9), and the higher the job satisfaction level, the higher the publication count. This correlation was triangulated by the fact that only those in

highest publication count categories deemed all their primary needs met (Figure 22).

The groups of participants who felt the most underserved in areas of job security, salary, safe working conditions, and perks and benefits, or were the least satisfied in comparison to their counterparts were: females, participants between the ages of 26-35, participants who spend the fewest hours on research, and participants with poor job satisfaction.

Without more intrusive questioning, it would be difficult to determine if participants within these groups were being underserved in reality, e.g., were women being paid less then men, or were they particularly sensitive to salary issues? Does discrimination against those who undertake less research occur? The question is itself open to interpretation and a participant's definition of 'adequate pay' will vary.

It is not a coincidence that the groups who were identified as being the most underserved in these areas are also the same participants that are least productive and motivated. However, it may not be true to say that these factors influence motivation and productivity, but that the results are a reflection of motivation and productivity. Promotion is dependent on productivity, so if participants are not very productive, it may be justified that they are paid less, or feel less secure in their job.

6.6 Publications and citations

The findings show that productivity was associated with being an older male, with no dependant and/or caring responsibilities, who typically devotes between 6-15 hours to research per week and is very satisfied with their job. There is evidence in the literature that males produce more and it offers possible reasons as to why (Long, 1993; Kyvik and Teigen, 1996; Xie and Shauman, 1998).

Publication and citation behaviour varies between fields of research in LIS (Panas and Willett, 2006). The differences between what research areas each sex is attracted to may have an impact on citation counts. Chemical information, for example, attracts more males than females and receives high numbers of citations, whilst human resource management attracts more females than males, and is an area of research that receives fewer citations.

7 Conclusion

The research demonstrates a correlation between the motivation levels and publication count of LIS academics. It is, as has been stressed, indicative only because of the nature of the sampling, and it does not prove a cause and effect relationship. Nonetheless, it provides some clues regarding possible motivational approaches to encourage greater output by LIS academics.

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