

CAREERS OF FEMALE AND MALE GEOSCIENTISTS

SUMMARY

This summary has been compiled by GAIA

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Major findings and messages

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Women acquire their function through job applications more often than men do. Men, more often than women, acquire their positions through networking or by being invited directly. This difference increases during the career. Within the government sector, job applications are formal, while networking is more important amongst universities.	9
Part-time work and family situation	
Men generally work a 36 or more-hour week, while women work less as their career progresses. Of senior women more than 50 % have part-time jobs of 32 hours or more, for the medior and junior women that figure is 80 and 90% respectively.	10
Men with children have part-time jobs far less often than women, although the differences are smaller amongst the medior group. Of the senior men with children 96 % work 32 hours or more, of the medior men 85 %. For senior and medior women with children that proportion is 37 % and 59 % respectively. Amongst the senior group half the respondents look after the children together, while within the mediator group that proportion is 65 %.	10
No connection was found between working at your own level and working part-time. In other words, even when working a shorter week, a contentual career can be realised.	10
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Having a partner with a paid job has a negative effect on women's salaries. That effect does not apply to men.	10
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Men and women do not differ in personal characteristics, motives for the choice of task or the degree to which they are appealed to by and perform risky, new tasks. Only medior women perform fewer of these 'development tasks', possibly because this is the period in which they have children.	14
Managers assess women at a lower level than men for the aspects of work performance, attitude to work and growth capacities in particular, ambition and the opportunities offered. This is striking, as, in view of the fact that this concerns career starters, they differ negligibly in actual function content.	14
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Women supposedly take up and are allotted different, less risky, more internally facilitating tasks. This does not contribute to career development, either.	14
With students there is: <ul style="list-style-type: none"> ◆ a 'paradox of visibility': women make themselves invisible by conforming to the male norm but attempting at the same time to be noticed by means of excellent results (graduate more quickly) to realise their professional ambitions ◆ a 'paradox of equality': everyone believes that women and men are equal, but they are nevertheless approached differently (in study counselling, for example). 	15
Conclusions and recommendations for participating companies	
Universities: a shameful situation, specific policy is urgently needed with attention to transparent selection procedures, in particular.	16
GTIs and research institutions: influx of juniors great, focus policy on retention and flow-through, possibly specific recruitment of medior and senior women, attention to selection processes and to perceptions	17
Oil and gas world: attention to retention and flow-through of (Dutch) women, attention to career development in part time jobs, attention to perceptions	17
Engineering companies: attention to retention and flow-through of women, attention to career development in part time jobs, possibly specific recruitment of medior women.	17
Conclusions and recommendations for the women themselves	
Women need to be aware of existing perceptions and deal strategically with their function content.	18
As women are seen as more insecure and more modest, it is important for them to clearly communicate their ambitions and performances.	18
Women need to pay attention to participating in internal and external networking.	18
Women need to be aware that the effect of minor decisions (working shorter hours, less heavy tasks) ultimately accumulates and can result in a less appealing function.	18

Summary

Introduction¹

On initiative and under supervision of GAIA a career study was started amongst female and male graduate geoscientists. The objective of the research is:

1. to find out whether women are underrepresented at 14 significant employers of geoscientists,
2. to find out whether there are any differences between the careers of male and female geoscientists,
3. if this is so, what this is caused by,
4. to formulate tailor-made recommendations based on the research results.

KNAG and KNGMG are supporting the initiative. The research is being paid for by the University of Utrecht (UU), the Free University (VU), Delft Technical University (TUD), KNGMG, TNO, WL | Delft Hydraulics, NIOZ, KNMI, RIZA, NAM and SHELL. NWO and KNAG are contributing in kind. Fugro and Grontmij have participated in parts of the research.

Why the research? Because under-representation can lead to a loss of talented geoscientists. Moreover, great diversity in personnel composition has a positive influence on the quality of the work. Variation in the way people experience and perceive issues leads to innovative research, questions and approach. Furthermore, recommendations for policy and for the geoscientific women themselves can be derived from the differences between the careers of male and female geoscientists. Prior to the research an inventory was carried out in a workshop of the questions

the participants had regarding the position of women within their organisation. These questions focused on the under-representation of women at various function levels, the possible differences in behaviour and competencies between men and women and the corporate culture and social context with regard to the combination of work and caring tasks.

The study comprised the following elements:

- research into representation of women with the employers listed (VanDoorneHuiskes and partners)
- research into the careers of female and male geoscientists by means of questionnaires (VanDoorneHuiskes and partners)
- research amongst men and women into task division (Dr. A. van Vianen – University of Amsterdam (UA))
- research into perceptions of and regarding men and women in the working environment (Dr. M. Brouns – University of Groningen (UG))
- GAIA has made several contributions regarding, for example, the professional sectors.

The questionnaires for the study were sent to all women whose addresses were known by the student unions of VU, UU, UA, TUD, Leiden Scientific University (LUW) (soil, water and atmosphere department) and Leiden University (UL) and an equal number of men (see page 6 for main graduation subjects). A total of 1,500 questionnaires was sent out. The response was 30 %.

Perceptions of participants at the beginning of the study regarding the underlying reasons for the under-representation of women. These were largely negated by the study:

"There are not more women in this field. And there are no senior women at all"

"Women have fewer ambitions"

"Women are not geared to exact sciences. They go to work in the softer sectors right after graduating"

"Women are not willing/able to do heavy work and/or work abroad"

"Women work in small part-time jobs"

"After 5 years women have children and then work no longer has any priority"

"Women go to the government sector, because they don't like the hard sector"

"Women are insecure and too modest"

¹. The summary was written by GAIA

Percentage of graduates versus actual representation

In the 1980s the average percentage of female graduates was approximately 15 %; since 1990 that figure has risen from 20 % to approx. 40 %.

The respondents to the questionnaire constitute a good reflection of the entire graduate population in the period 1980 to 2003 where main graduation subjects are concerned.

The influx of junior women in participating institutions generally corresponds with the graduation percentages, but medior and senior women are under-represented. Within universities there are hardly any women in permanent positions.

The total number of graduate women since 1980 is an average of 22.5 %. From 1990 that number was 20 % and from 1994 32 %. Between 1980 and 2002 approximately 1,100 women and 4,200 men graduated. A total of 1,500 questionnaires were sent out and the response 30 %. The respondent group consists of 309 women and 191 men (roughly 30 % and 5 % respectively of the total population). The respondents were divided into three sub-groups according to the time of graduation (see table 1). The major graduation subjects were physical geography and geology. Men and women do not differ in their main graduation subjects.

	Men		Women		% graduated
	total	respondent	total	respondent	
junior (98-02)	703	52 (7 %)	326	103 (30 %)	32 %
medior (92-97)	1131	64 (6 %)	425	133 (30 %)	27 %
senior (80-91)	2352	75 (3 %)	355	69 (18 %)	13 %
total (80-02)	4186	191 (5 %)	1109	305 (28 %)	21 %

Table 1. Composition of graduate population and respondents per sub-group. The figures do not include the graduation years 2001-2002 or 2002-2003. The numbers for the graduation years 1991-1992 and 1995-1996 have been estimated, as these were not known by the central statistical office (CBS). CBS graduation year 1997-1998 was counted into the calendar year 1998.

For the participating universities (UU, VU, TUD, and for Twente TU and #WUR), research institutions (TNO, WL | Delft Hydraulics, NIOZ, KNMI, RIZA), oil and gas companies (Shell and NAM) and engineering companies (Grontmij and Fugro-Engineering office) the representation of women at various function levels was compared to the potential representation based on graduation percentages (figure 1). For most companies there is good representation of women who graduated less than 5 years ago. Women who graduated longer than 5 years ago are under-represented in all organisations. The under-representation of women in general is the greatest for the medior group (graduated 5-10 years ago). Women are well represented in the assistant research fellow, trainee research worker and post-doctorate functions at a large proportion of the universities. These are temporary positions, however; there are hardly any women in permanent positions. The research group at the Water Management department of Twente TU is an exception.

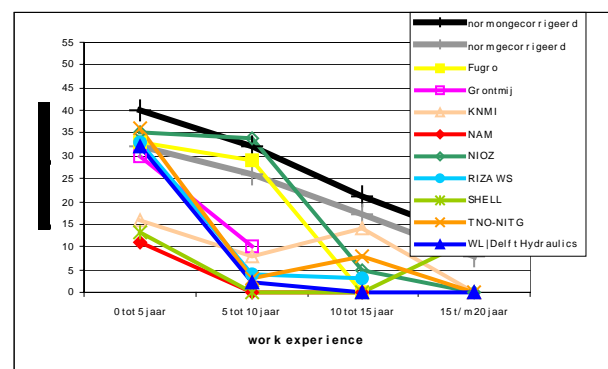
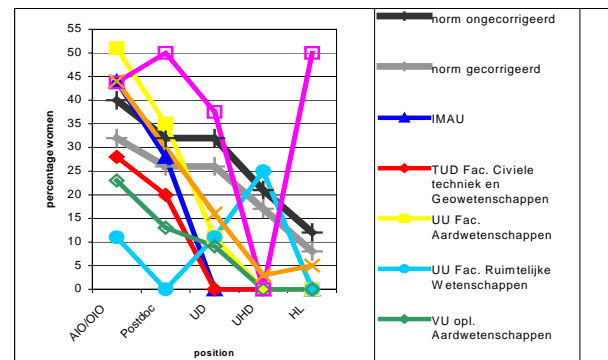


Figure 1. Representation of women in comparison with (corrected) potential availability for participating universities and companies.

Geoscientists' Careers

Influx: geoscientists want to work in their discipline!

For half the respondents their geoscientific training was indispensable in their first job and for 30 % practical, but not necessary. This applies primarily to the government and geo-consultancy agency sectors. In the universities, GTIs and oil and gas business sectors the geoscientific training is generally indispensable. As the major reasons for their choice, respondents named the interesting discipline and the link with their study. They also named personal development, the opportunity to work abroad and the social relevance. For 20 % of the respondents their training was not relevant in their first function. If the first function was not a 'geo-function', for 80 % of the respondents the reason was that they could not find a job in this professional field. Respondents also said they found other activities more appealing. A proportion of these did, however, fulfil a function that fitted, in their second job, more closely with their training. There were no differences between men and women, either in wishes or in practice, for the influx to a first function.

Professional sectors: women and men continue to work in their discipline to an equal degree; women more often tend to move over in time to the government sector.

Figure 2 shows the career path for the senior sub-group (see table 1 for explanation of sub-groups). Major professional sectors are the universities (10- 20 %), the government (10-35 %) and the consultancy world (20-40 %). Approximately 5 % of the respondents work in the oil and gas sector; in the research institutions and GTIs that figure is also approximately 5 %. A few percent of the respondents work in the education sectors and other geoscientific businesses. A slightly larger group works in non-geoscientific businesses (10-15 %).

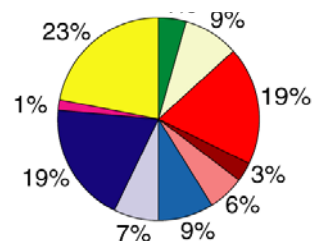
Within the senior group it is noticeable that women increasingly work in the government sector the further their career progresses, from 9 % directly after graduation to 36 % 11 years after graduation. Their participation in the Dutch university world drops from 19% to 7 %, as approximately 20 % of the women are working in the consultancy world. Of the men in this group approximately 6 % work in the university world. Their participation in the consultancy sector increases from 24 to 36 % and their participation within the government sector increases from 10 to 20 % (also 11 years after graduation). Although more women than men start their careers in a university, in time fewer and fewer women are actually working in universities.

The trend of women going over to government jobs slightly more than men is also noticeable in the medior group. In the junior group there are, as yet, no recognisable trends, due to the short duration of the career.

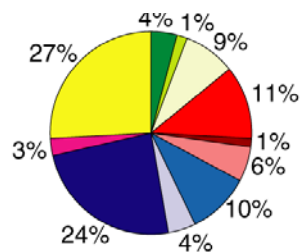
Women give mainly contentual reasons for their shift to the government: broader scope, more relevant work. More women than men within this sector indicate that they are occupied with policy. What is striking, however, is that within the government sector both men and women acquire their functions primarily through formal application procedures. Women also value most function aspects in the government sector more than men (see 'satisfaction').

Figure 2. Senior sub-group career path (see page 8)

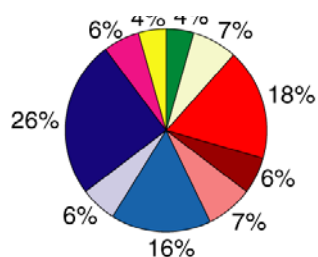
Women graduated between 1980-1991
1 year after graduation (n=68)



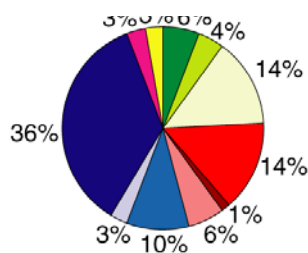
Men graduated between 1980-1991
1 year after graduation (n=68)



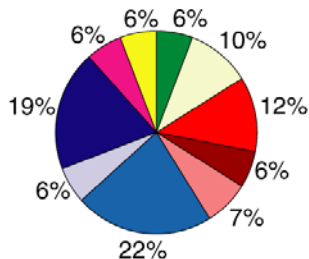
3 year after graduation (n=68)



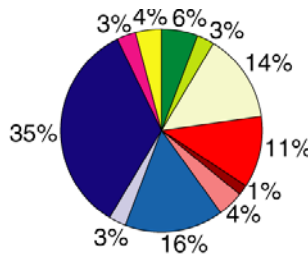
3 years after graduation (n=70)



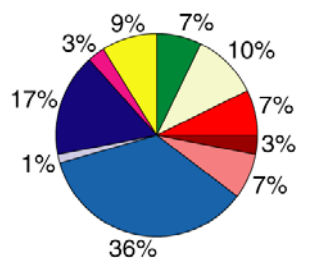
6 year after graduation (n=68)



6 year after graduation (n=70)



11 year after graduation (n=68)



11 year after graduation (n=70)

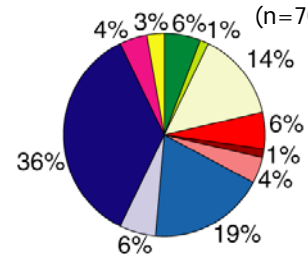


Figure 2. Senior sub-group career path

Career characteristics

Differing career characteristics between men and women increase in the course of the career; men have the 'better' jobs.

Men have more consistent careers. Women's careers progress less often in a rising line.

Differing career characteristics, such as the number of management functions, number of permanent functions, number of functions in another field, number of senior functions and number of functions requiring geo-training were compared for the various sub-groups. The differences in the junior sub-group are small; slightly more women work in another professional field. In the medior sub-group slightly more men have a management function. In the senior sub-group men appear to score higher for all characteristics. Men more often occupy functions with a permanent employment contract, full-time, management and senior functions. Women work slightly, but not much, more often in another professional field.

Women's careers progress less often in a rising line (see figure 3), less often with permanent employment contracts, less often in a chain of senior functions. A career-oriented approach to work generates a higher salary primarily for men. Having a partner has a negative effect on women's salaries but not men's.

There is no connection between working at your own level and working part-time. In other words, a contentual career can be realised even with a smaller job.

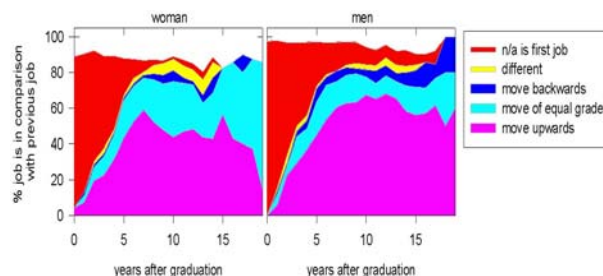


Figure 3. 'Function growth'

Function characteristics per professional sector

The geo-training remains indispensable during the career, particularly within the 'geo-sectors'. In governmental institutions, as the career progresses, this is primarily 'practical but not necessary'.

Function acquisition in the government sector takes place primarily through application; at universities primarily through networking. The importance of networking increases in all sectors during the career, particularly for men.

The function characteristics vary per professional sector. At universities the differences in function characteristics are the greatest; women hardly ever acquire permanent, senior or management functions. Within the oil and gas sectors, universities and GTIs and the 'geo-sectors', the geo-training is indispensable for almost all men and women. For government functions the geo-training during the career is increasingly 'practical but not necessary'. For the geo-consultancy agencies, the geo-training is indispensable for half the men and women. Function acquisition takes place within universities primarily via networking; this applies to 80 % of the men and 60 % of the women. In the government sector most functions are acquired via formal application procedures. At geo-consultancy agencies the importance of networking increases during the career, more for men than for women.

In all sectors women acquire their functions more often through application, while networking or being invited becomes increasingly important primarily for men during their career (see figure 4).

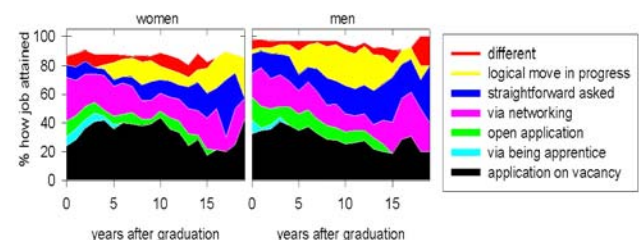


Figure 4. Function obtainment

Part-time working and family situation

Men generally work 36 hours or more, while women start working fewer hours as their career progresses. Of the senior women, more than 50 % work in large part-time jobs of 32 hours or more.

Approximately 80 % of the men in the older sub-groups work more than 36 hours; the rest work 32 hours or more. For the women the figures are different. Almost 80 % of the junior women, 60 % of the medior women and just over 30 % of the senior women occupy jobs of more than 36 hours. Jobs of 32 to 35 hours are occupied by approximately 20 % of the women from all sub-groups.

Approximately 30 % of the senior women therefore do have jobs, but of fewer than 32 hours. Approximately 45 % of the respondents gave parenthood as the reason for working part-time; approximately 35 % said they wanted more free time. Of the men another 9 % said they still had another function.

Figure 5. Working week length for men and women of the various sub-groups (page 11)

Figure 6. Relationship between working week length and having children (page 11)

Men with children work part time far less than women do. In the medior group the differences are less than for the senior group. Approximately half of senior respondents take an equal part in looking after the children; amongst the medior respondents that proportion is 65 %.

Children were born 5 to 10 years after the women had graduated (the medior group). For men this is slightly more spread (5 to 15 years). Regarding the distribution of the care task 53 % of the men and women said that they looked after the children to an equal degree. With 50 % of the senior respondents it is primarily the woman who cares for the children and almost 50 % say they do it together. Of the senior men with children 76 % have jobs of more than 36 hours and 20 % of 32-35 hours. Of the senior women with children 23 % have jobs of more than 36

hours and 14 % of 32-35 hours. In the medior group these figures are somewhat closer. Here, 30 % of the women still primarily take care of the children, while 65 % of the respondents do it together. Of the men, another 59 % have jobs of more than 36 hours and 26 % of 32-35 hours. For the women, that is. 26 and 33 % respectively. Another striking point is that women give their partner as the factor that is important for their career, both in a positive and negative sense.

Function quality full-time functions

Working part-time is not the cause of the differences in function quality; women working full-time also realise a lower function quality, but do have more 'geo-functions'.

When the careers of men and women with 10 to 15 years of working experience and working weeks of 36 hours or more are compared, it appears that there is still a difference in function quality (see table 2). On average, the women have fulfilled slightly more functions and slightly more full-time functions, but fewer permanent functions, fewer management functions and fewer senior functions. They have, however, occupied more functions for which geoscientific training was indispensable.

'86-'91 group, full-time	M	F
number of respondents	48	23
number of functions	4.2	4.5
full-time functions	4.0	4.2
permanent functions	3.1	2.0
management functions	1.5	1.1
senior functions	1.6	1.1
geo-training indispensable	1.5	2.4

Table 2. Average number of functions in the careers of men and women working full-time with 10 to 15 years work experience.

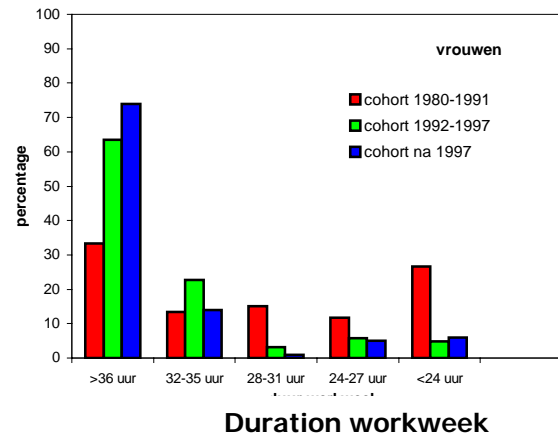
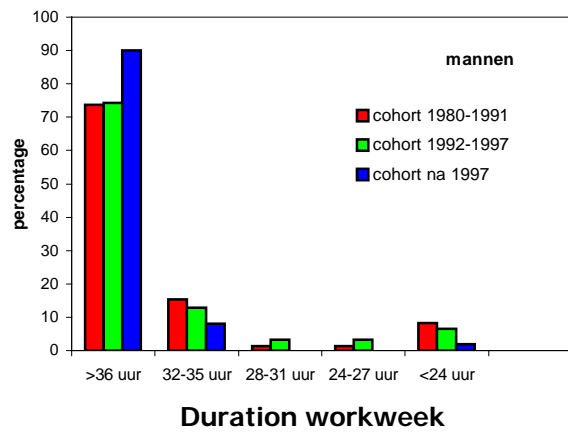


Figure 5. Working week length for men and women of the various sub-groups

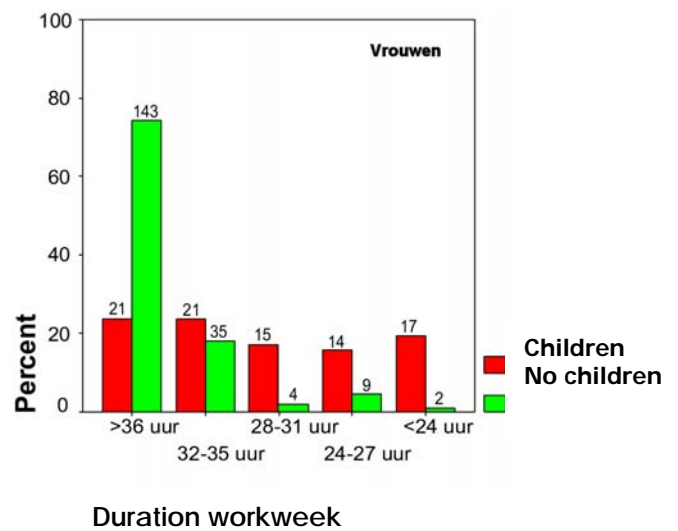
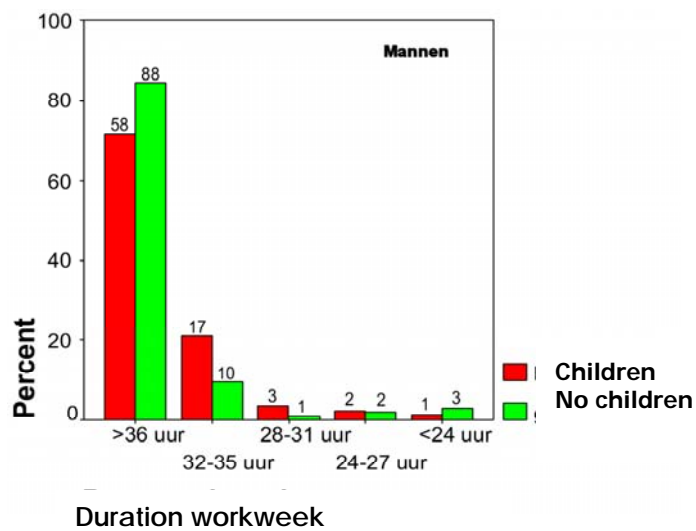


Figure 6. Relationship between working week length and having children

Management

Men more often have a management function than women. Management is primarily part of jobs of more than 36 hours. Senior women do also manage in smaller jobs. Slightly more men than women in management functions have children.

The degree to which management is part of the job varies. In the senior, medior and junior sub-group 39, 20 and 4 % respectively of the men have a management function; for women that percentage is 22, 10 and 6 % respectively. Men chiefly carry out a management task (90 %) in jobs of more than 36 hours. Half the senior women managers work more than 36 hours, 13 % work 32-35 hours per week, and 40 % in jobs of fewer than 32 hours. For the younger sub-groups management functions are primarily carried out in jobs of more than 36 hours. When questioned on the management task, the differences appear to be slightly smaller; the number of women with a management task is roughly two-thirds of the number of men (59% of men as opposed to 39 % of women in the senior sub-group and 45 as opposed to 26 % in the medior sub-group; in the junior sub-group the percentage is the same, at 15 %).

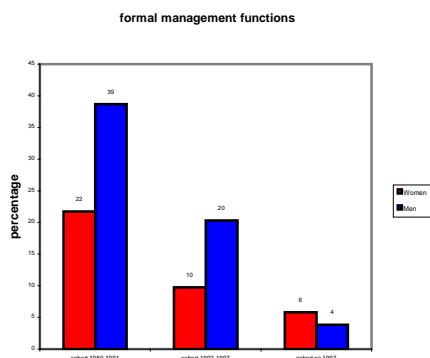


Figure 7. Management functions

Ambitions

Women and men hardly differ in ambition level.

The current career ambitions for the entire group of respondents hardly differ; 70 % say they are aiming for more contentually interesting work, 24 % want a (heavy) project leader's function, 24 % are looking for a management function at middle management level and 19 % a senior management position. Slightly more men (17 %) than women (9 %) are aiming for a top level.

There are some slight differences in the degree to which men and women think they will realise these ambitions: 66 % of the men and 56 % of the women think they will succeed, 29 and 42 % respectively say the do not know if they will succeed. There is no difference in the degree to which men and women's current functions match their interest/preference. There is, however, a difference in the degree to which the current function corresponds with the expectations at the beginning of the career. 35 % of the men said their current function corresponded only partly or not at all with their original expectations; with the women this percentage increases from 32 % to 56 % amongst the senior women. There is, incidentally, otherwise no difference between the percentage of men and women that say they are not working at their own level (approximately 15 %).

Satisfaction

Women within the government sector value most aspects of their function higher than men. Within the universities this is the reverse. At the geo-consultancy agencies there is hardly any difference in appreciation.

A career with more geo-functions provides more satisfaction regarding the content of the function. A career with more management functions provides more satisfaction regarding career opportunities and less satisfaction regarding working hours.

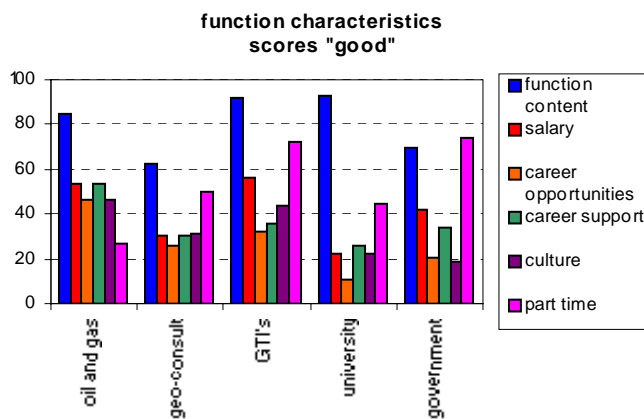


Figure 8. Valuation of function characteristics

The valuation of 20 function aspects, categorised by content, salary, career opportunities, development, culture and working hours, varies per professional sector. Within the 'geo-sectors' (oil/gas, GTIs and universities), in particular the content of the function is appreciated. Career opportunities are valued the lowest in universities. The corporate culture scores the

lowest in the university and government sectors. Working hours score the highest within the government and GTI sectors, and the lowest in the oil and gas sector.

Within the government sector women value almost all function aspects more highly than men do, while the situation is reversed in universities. At GTIs, women give many function aspects a higher score than men. Within the geo-consultancy world there are hardly any differences in scoring. Within the oil and gas sector the content of the function and the development opportunities score slightly higher amongst the men and amongst women the working atmosphere, corporate culture and working hours.

When all respondents are considered together, but by sub-group, there are few differences between men and women. In the youngest sub-group women are a little more satisfied regarding content and development opportunities. In the medior sub-group women are more satisfied with their salary, even though they actually earn slightly less. Senior men are more dissatisfied than women with the possibilities for part-time work, with the degree of recognition and the working atmosphere.

A career with more management and full-time functions is accompanied by a lower level of satisfaction regarding working hours, but a higher level of satisfaction regarding career opportunities. A career with more geo-functions generates more satisfaction regarding the content and level of the work. A career with more senior functions provides satisfaction in respect of independence, external contacts and the status of the function.

Task content and management assessment

Men and women do not differ in their personality characteristics, such as ambition and self-image, motives for task choice and the degree to which they are appealed to by and perform new, visible, risky tasks. Only medior women perform fewer of these development tasks.

Managers assess women lower than men for the aspects of work performance, attitude to work and, in particular, growth capacities, ambition and opportunities offered.

Performing new, risky, visible tasks - the so-called 'development tasks' - is important for the future function level. The degree to which development tasks constitute part of the work package depends on personality factors, such as a positive self-image and ambition, learning-related objective orientation (as opposed to performance-related objective orientation) and with the motivation to demonstrate their own capacities (as opposed to avoiding risk).

Men and women differ neither in these personality characteristics, nor in the degree to which they are appealed to by and perform such development tasks. Only the medior group of women indicated that they performed fewer development tasks, although men and women in this group indicated to an equal degree that they would like to perform these tasks. A possible explanation for this is that this is the period in which women have children.

Striking is that managers (n=29) assess women's work performance, attitude to work and, in particular, growth capacities, ambition and chances offered lower than men's (36 matched pairs), while their formal assessment in the latest evaluation interview regarding women's functioning is more positive. This is striking because these are career starters where the actual function content still hardly differs.

Perceptions regarding men and women

At work

Men in higher positions are strong advocates of the equality ideal and meritocracy (rewarding according to performance), although they can see around them that the opportunities for men and women are not equally realised. They are opposed to specific policy.

Women supposedly have different competencies and exhibit different behaviour than men (more sociable, more broadly interested, operate differently in the market), although these positively appreciated differences do not contribute to career development.

Women supposedly take up and are allotted different, less risky, more internally-facilitating tasks. This does not contribute to career development, either.

At the NAM, TNO and UU, on the basis of interviews, existing perceptions regarding men and women were looked at. When men and women talk about equality, this is generally in the sense of equality of skills. The perception is that women and men, although professionally equal, are not equal in the sense of 'sameness'. Women supposedly have different competencies and exhibit different behaviour than men (more sociable, more broadly interested, operate differently in the market). Women are also supposedly more prepared to take on internally-facilitating tasks, while men focus more on the prestigious development tasks related to the company's core business. Although the supporting tasks are important to the functioning of the organisation they contribute less to career development. A few managers referred to the internally-facilitating, supporting tasks as women's flight behaviour or even said they warned them not to take on these tasks. These positively-rated competencies therefore contribute nothing to women's careers. Finally, according to the men

interviewed, women are supposedly more insecure and too modest regarding their competencies. Women, on the other hand, are amazed at the certainty with which men postulate findings, even though they are aware that they are not so certain at all.

Although women say they get on fine with their male colleagues some do express the wish not to always have to adapt to the men's culture. Primarily older men are said to find it difficult to deal with assertive young women.

Students

Amongst students there appears to be:

- a 'paradox of visibility': women make themselves invisible by conforming to the male norm but attempting at the same time to be noticed due to excellent results (graduate more quickly) to realise their professional ambitions
- a 'paradox of equality': everyone believes that women and men are equal, but they are nevertheless approached differently (in study counselling, for example)

Finally, a few words about students. GAIA requested degree classifications, which showed that women with the same classifications finish their studies up to six months more quickly than men.

Although students were not included in this research, a work placement study was carried out amongst earth sciences students and former students at the Free University by M. van den Brink², under the guidance of Dr. I. Stobbe. The study focused on the way the university education plays a role in the choice process of female students during and after their study. Van den Brink distinguishes two paradoxes, that of equality and that of visibility.

The 'paradox of visibility' entails female students in an environment dominated by men attempting to conform, to make themselves 'invisible' by, for example, their

(functional) manner of dress and their (macho, self-confident) behaviour. To realise their ambitions, however, they have to be noticed at the same time. Some women do this by focusing on producing excellent results (graduating more quickly).

The 'paradox of equality'. Both women and staff members believe that, while male and female students are treated equally and have equal opportunities, there are still differences. According to van den Brink, this is reflected, for example, in the way the study of geology is presented, namely as a heavy course, both physically (fieldwork) and intellectually (science), where masculine qualities are valued more highly than feminine qualities. Female students find the study suitable for 'tough women', and distance themselves from the 'girly' type. They think the 'softer' girls would be unable to keep up with the course. They also feel they no longer need to prove they possess the same qualities as men, but have experienced situations where a lecturer has contended that women are less suited to earth science studies or functions.

Staff are also said to be more likely to advise women with more feminine qualities to opt for the 'soft' side of earth sciences, such as environmental sciences, instruction, policy or education. One study advisor said, for example, that female students should be aware that geology is a science study, requiring exact knowledge. Female students deny that any distinction is made; according to van den Brink because it is more to their advantage to do so.

Female post-graduates do say they experience differences; they often feel extremely visible as one of the few women on the work floor and feel they are given other tasks than men (they are deployed as 'assistants', or are reminded of their female identity in other ways).

² M. van den Brink, 2003. Paradoxen in gendersubtekst. VU Amsterdam

Conclusions and recommendations

General

Women and men hardly differ in main graduation subject and personality characteristics such as ambition and self-image and the degree to which they are willing to perform risky, visible, prestigious tasks. Women end up working in the government sector more often than men and work more often than men in (large) part-time jobs. On the other hand it is more difficult for men than for women to work part time, let alone build a career in a part time job. Men realise more consistent careers and they get more out of these careers. Women still take a greater share in caring for the children, There is, however, a visible shift here to more joint responsibility in the medior sub-group, although having a partner with a paid job has more influence on their career than for men. Women perform management tasks in smaller jobs, managing more, but less qualified people. Even when women work full time they realise a lower function quality (fewer senior functions, fewer permanent functions and fewer management functions). Finally, the formal assessment by managers of women's work may be more positive, but managers are more negative concerning women's attitude to work, performances, growth potential and ambition. The image is that of small, but cumulative differences.

Although men and women consider themselves equally professionally competent, they also see women as different. Women are reputedly more sociable, more broadly interested. They operate differently in the market. They are also supposedly more prepared to take on internally-facilitating tasks, to be more insecure and operate less politically, or to be less involved in internal and external networking.

Both the fact that women work increasingly part time and still shoulder a larger proportion of the child care, and the perceptions within organisations regarding

women probably contribute to women realising fewer consistent, fewer 'rising' careers. This is all within the Dutch context, with culture-determined opinion regarding childcare and the lack of childcare facilities. It should be remembered that these are judgements that apply to the current population of women and men. They cannot be seen as having any predictive value for the junior women and men.

Participating companies

Universities: a shameful situation, specific policy is urgently required, primarily attention to transparent selection processes.

The participation of women within the university world in permanent positions, at fewer than 5 %, - with the exception of Twente Technical University - is shamefully low, while the percentage of women in temporary positions is 33 %. The majority of permanent positions becoming vacant in recent years have been filled by men. Those women with a permanent position have largely acquired them through NWO incentive subsidies. The lack of realisation of urgency amongst the men interviewed indicates that there is cause for concern that this situation will continue. A specific policy is necessary and urgent. Striking is that, in this sector, functions are primarily acquired through networking, This applies to 80 % of the men and 60 % of the women. It would be advisable to formalise the faculties' appointment policy and make it more transparent. The meritocratic principle that only the "best" candidates can be appointed to permanent functions appears, in practice, to go hand-in-hand with the exclusion of women. It is advisable for universities to fulfil their legal obligations as government institutions with regard to equal representation.

Research institutions: influx of juniors is great, policy should be geared to retention and flow-through, possibly specific recruitment of medior and senior women, attention to selection processes, attention to perceptions

Within most research institutions (WL, TNO, RIZA, NIOZ) the influx of junior women is great, and generally corresponds with the graduation percentages. In medior and senior positions women are seriously under-represented. From the outflux data the companies supplied for the last 5 years it would appear that the problem is more one of late influx than heavy, premature outflux of women, although this does occur to a certain degree. Selection processes for influx appear to have been a major barrier for the influx of medior and senior women. After all, medior (more than 400 graduate women) and senior women (more than 350 graduates) were and are, actually available in the labour market. The career questionnaire shows that women, more often than men, acquire their function via a formal application. As the career progresses men acquire functions increasingly often through networking. As this can form an obstacle for the medior and senior women, in particular, conscious recruitment of women for medior and senior functions would seem to be a solution.

Attention to retaining women and encouraging them to flow-through is essential, with consideration for enabling career development in large part-time jobs, recognising and acknowledging women's ambitions, task distribution and the various, sometimes stereotyping images of women and men. Misapprehensions such as that women are less ambitious need to be tackled actively.

One last comment: Although these employers employ relatively large numbers of geoscientists, this is for none of them more than a few percent of the number of graduates since 1980. The vast majority of the graduates end up with other employers (primarily the consultancy world and the government). The research institutions would be well advised to ask themselves whether their selection processes are in order, in

other words whether they are capable of attracting the top talent from this enormous supply.

Oil and gas world: attention to retention and flow-through of (Dutch) women, attention to career development part time, attention to perceptions.

Striking at NAM and Shell is the low percentage of women in functions requiring little experience and the lack of Dutch women in heavier functions. The influx of young women has been in line with the graduation percentage in recent years. Outflux would appear to require attention, in view of the fact that no medior or senior women work within NAM and only a limited number at Shell. Women and men name the full-time culture as an obstacle for a good work-life balance. A career in a large part-time job appears to be impossible. There are also still a great deal of perceptions regarding men and women, even within the oil and gas world and the (older) men's culture appears to be unappealing to both younger men and women.

It has regularly been mentioned that it appears more difficult for Dutch women to flow through than for American or English women. For the oil and gas sector, too, the number of geoscientists employed forms only a small percentage of the number of graduates since 1980 and the potential supply of women, too, is relatively large.

Engineering companies: attention to retention and flow-through of women, attention to career development in part time jobs, possibly specific recruitment of medior women.

The influx of women in recent years appears to be in order. Striking is that the participating engineering companies demonstrate a slightly different image from the function characteristics of the respondents working in geo-consultancy agencies, in which the differences between men and women are not especially great. According to the organisations involved, the outflux of women with a number of years'

work experience is greater than that of men. Attention to career development in large part-time jobs and to corporate culture aspects is important here.

For the women themselves

Women need to be aware of existing perceptions regarding women and to deal strategically with their function content, particularly with the tasks they take on.

Women are perceived as insecure and more modest; it is important for them to clearly communicate concerning their ambitions and performances.

Women need to pay more attention to participating in internal and external networking.

Women need to be aware that the effect of minor decisions (working shorter hours, fewer heavy tasks) is ultimately cumulative and can result in a less appealing function.

Women and men have comparable ambitions and personality characteristics. Women, however, are confronted with perceptions and judgements by their colleagues and managers of their behaviour and competencies, which possibly also influence their own perceptions and behaviour. Although the task study shows that only the medior group of women performs fewer risky, prestigious tasks than the men, the literary study shows that it is also the perception that women are more

likely to perform facilitating tasks than men. The perception that women are socially more skilled also possibly leads to the allocation of tasks that are not part of the organisation's core tasks and do not contribute to a positive evaluation with regard to personal development.

A lot of women have children between 5 and 10 years after graduation. In a lot of organisations career development in large part-time jobs is not accepted, or there are perceptions that ambition and career development do not go together with having children. Women need to take a proactive stance here, make their ambitions clearly known and make agreements as to how their career will develop further, with children.

The family situation is more relevant for women than for men; a large proportion of women still have the primary care tasks and having a partner with a paid job has a negative effect on their salaries. The fact that it is still difficult for men to work part time probably plays a role here. This should be a subject for discussion within the family. Although there is a clear trend towards sharing care more equally, it remains important for women to make good agreements with their partner so they do not lose the 'battle' over the care of the children.

Women need to be aware that the effect of minor decisions (working shorter hours, fewer heavy tasks) is ultimately cumulative and can result in a less appealing function.