

## **Miles of Pipeline, Millimetres of Pool**

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#### *Document Version*

Final published version

#### *Publication date:*

2005

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#### *Citation for published version (APA):*

Mathieu, C. (2005). *Miles of Pipeline, Millimetres of Pool: Cognitive limitations and possibilities in managerial views on promoting gender equality in the IT sector.*

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Download date: 26. Sep. 2021



# Working Paper

No. 2005-03

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**Miles of Pipeline, Millimetres of Pool:  
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# **Miles of Pipeline, Millimetres of Pool: Cognitive limitations and possibilities in managerial views on promoting gender equality in the IT sector.<sup>1</sup>**

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## **Abstract**

This paper examines how basic cognitive processes lead to the non-recognition of processes that lead to or sustain gender inequality in the Information technology sector. The paper is based on empirical research carried out in Sweden and Ireland from 2001-2004. The central thesis is that “delusions” about gender equality in the IT sector are sustained by positional factors (governing what one can see from a vantage point and what type of data one can, and one is encouraged to, gather and process); ideological factors (how information is “fit” into pre-existing frameworks to which one has political or organizational commitments) and more rudimentary processes of “optical socialization” (Zerubavel) and “good reasons for holding false beliefs” (Boudon). A series of “delusions” found in empirical research are described and analysed. The paper concludes by sketching out how such cognitive hindrances and barriers can be overcome within organizations, and how this could lead to a greater recognition of the processes facilitating or causing gender inequality in a branch that frequently sees itself as “gender neutral” as well as measures to actively promote gender equality.

Keywords: gender inequality, Information Technology, management, delusions, cognition

## ***Introduction***

Though it may initially sound unduly provocative, this paper is built up around a series of widespread and well-founded “delusions” about gender equality and inequality found among managers (and employees) in a study on gender in the Information Technology sectors in Ireland and Sweden.<sup>2</sup> The term delusion has strong negative connotations, being most often associated with mental ill-health or megalomania. However, stripped of its everyday associations, the term means little more than a false belief, and to subscribe to a delusion means little more than to subscribe to a false belief. The abrasiveness of the term is further tempered through this article by pointing out two factors associated with delusions in general and those discussed here in particular. The first is that holders of delusions are in good company. We all subscribe to delusions for very pedestrian reasons; we rely on others in good faith for an overwhelming amount of the information that we acquire and act upon every day. We cannot “check the facts” for each discrete piece of information we acquire, nor even for

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<sup>1</sup> I would like to thank Karen Davies (Swedish National Centre for Working Life) my co-investigator on the project, and Morten Knudsen, Kristian Kriener and Ann Westenholtz (all Copenhagen Business School) for critical and constructive comments on this paper.

<sup>2</sup> The study *Causes of gender inequality in the IT sector: A comparative study of Sweden and Ireland* was financed by the Swedish Agency for Innovation Systems (registration number 2001-03649, project number 18327-1) and carried out with. The companies that participated in the project were primarily software development and consultancy companies, falling into the NACE 72.20 category.

bundles of information or theories that we accept and assimilate. The second reason is that our many of the delusions we subscribe to and operate upon are based on *good reasons*, impeccable logic and innumerable daily experiences that confirm the validity of the delusion. So being “delusional” far from being a sign of mental impairment is actually a very normal circumstance. This does not however mean that the operation of delusions is benign. As this article evidences, delusions related to gendered practices in the IT sector inhibit actions that would promote sex equality in the sector.

As this article deals with gender and sex inequality, a few words on how this topic is dealt with in this article are in order. On one level sex inequality in the branch has to do with the ratios of men and women in the branch and in various functions and levels within the branch. This interest has disparagingly been called “body counting” (Alvesson & Due Billing 2002). In and of itself body counting is of limited interest, though it may lead to attention to / be indicative of gendered processes that result in particular patterns that counted bodies may comprise. The most interesting question from a research perspective is what it is that produces the arraying of different types or categories of bodies throughout an organization, sector or labour market. Or, more particularly for our purposes, the role that gendered processes play in arraying bodies. By gendered processes we mean the way in which understandings and ensuing practices of male and female impacts the way persons classified as men and women<sup>3</sup> are allocated resources, opportunities, types of attention, expectations, positions, etc.

The relevance of the arguments in this article to managers and management stems from the central role they play in permitting or arresting the processes discussed. While the cognitive processes elaborated below are fairly generic and universal, as Reskin (2000) argues, they can be countered by recognizing their operation, and developing and implementing practices and routines to counterbalance or moderate the negative effects of their operation. This entails managerial awareness, attention and action. Though this may sound simple, it can be more threatening than cursorily admitted, for it requires not just recognising that actions taken in good faith and with good intentions have discriminatory effects, but that preventing discrimination requires creating systems based on explicitness and transparency in which other actors, managers or employees, are given access and oversight responsibility in ferreting out possible sources of biases. Acceptance of this fact, it is hoped, can be tempered by showing that these discriminatory effects are not intentional, but rather largely the product of basic thought processes. Individual thought processes and their content need not act directly on the world, especially in organizations. They can be channelled through social processes which can be constructed to ferret out unintended bias towards groups, individuals, characteristics and even accepted ideas and beliefs. For managers this is of vital importance due to the consequences of their beliefs and actions.

The structure of the article is as follows. After presenting a brief introduction to the empirical research project upon which the points in the article are based, the cognitive perspective that is applied in the analysis is presented. In the main section of the article the delusions are analysed. What these delusions are is briefly stated. Subsequently, why the delusion is a delusion is discussed, that is to say why a given understanding or explanation is a false, weak, or incomplete understanding of the reality which the delusion seeks to explain or orient action in. Finally, what it is that supports the delusion is explained. The empirical discussion is

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<sup>3</sup> Woman and man are “basic” or root categories of which there are more specific denominations or classification based on age – girl/boy, marital status – husband/wife, parental status – mother, father, and a range of gender specific pejorative terms such as bitch, wanker, etc. One of the primary contentions in feminist theory is that none of these categories comprise natural, neutral, non-normative, non-evaluative content.

rounded off with what is more aptly described as a “mental omission” than a delusion. This mental omission is however the product of much the same process as the delusions.

### *The project*

The empirical material in this study is drawn from a project on causes of gender inequality in the IT sectors in Sweden and Ireland.<sup>4</sup> The study was carried out from 2001-2004 and the main part of the study comprised of interviews with managers and employees at eight IT companies in Sweden and five in Ireland.<sup>5</sup> Of the eighty-three interviews carried out in this part of the study, 27 interviews were with executive or senior managers. The discussions in this article are based primarily on the interviews with these executive and senior managers, though identical positions, observations and reasoning were found among employees as well. Almost all of the delusions discussed here are widespread throughout the sector, and not indigenous to the senior management cadres. The reason for focusing attention on senior and executive management is the role that these delusions play in the allocative and policy actions and inactions that management can take.

Among the executives, seven were ownership partners and usually also founders in their firms. The other senior managers were personnel managers, chief technical officers, regional office or large departmental/divisional managers. The smallest company had a staff of 10, the largest several thousand globally. The interviews were semi-structured, with a few themes and specific questions. Gender issues were addressed specifically in one section of the interview guide, but other more general topics such as corporate history, recruitment and training/competence development, engagement in branch or employers organizations and contact with educational institutions were covered, as well as personal career history. The interviews with managers lasted between one to two hours, and were often supplemented with written documentation about the company, its annual reports, employment policies and statistics, and gender equality plans if these existed. Among the executives there were two female CEOs, one in Ireland and one in Sweden. Overall, 14 of the 27 senior and executive management interviews were with women. The fact that there is a majority of women in this group is in part a function of interviewing the HRM manager at each company (usually a woman) and our expressed wish to interview women in senior positions in each company.

### *The cognitive perspective*

Cognitive processes lead managers to highlight, explain and act based on certain information and “theories”<sup>6</sup> while overlooking other equally relevant information and “theories.” It is argued that basic cognitive processes, the way we categorize things and the existence of “satisfactory” broad explanatory frameworks lead to training managerial attention, both in thought and practice, away from significant areas that would contribute to changing both perspectives and actions/strategies.

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<sup>4</sup> The focus of the study was on factors *within the sector* as opposed to *external*, but adjacent factors and spheres, such as for example in the educational systems leading into the sector.

<sup>5</sup> The other primary part of the project consisted of telephone interviews with two cohorts of women who had studied Computer Science at a major Swedish university. This first cohort completed a degree (or were half-way or more towards degree) in Fall 1990 or Spring 1991, while the second cohort had attained the same status as the previous in Fall 1996. In all, 49 interviews were conducted in this part of the project. No material from this part of the project is directly presented in this article.

<sup>6</sup> The term theory is used here to denote a complex of ideas in which some identified factors or forces are deemed to causally produce identifiable outcomes, though the causal process or mechanisms may remain unspecified or elaborated.

Several basic cognitive processes are discussed here and have bearing for the ensuing analysis. There is another important factor, the *institutional* inclination and opportunity to uncover gender inequality, but this has less to do with a cognitive process but rather perceptual opportunities and resources based on one's social or organizational position.

In cognitive science two processes are seen as fundamental. The first is *sensation*, which focuses on the discovery or detection of information. The second process, which places or positions information, is called *attention*. Both processes are necessary for thought and are seen as "normal brain operations" (Cerulo 2002: 17). While these processes largely remain the purview of cognitive science and neurologically oriented branches of psychology, they increasingly have been appropriated and developed in the social sciences.<sup>7</sup> This development naturally shifts attention from neurological processes to social processes. Focuses range from either delineating and exploring similar or comparable processes at the social level, or examining how social processes are dependent upon the way the mind functions, or the opposite – how social processes impact neurological functions. Following Zerubvel (1997; 2002) I focus primarily on the role of attention, especially the social aspects of how culture and cognitive conventions focus attention on some things and lead us to ignore other things, including obvious things. One of Zerubavel's primary points is that the cognitive, in this case what we see, what we pay attention to, is at times governed by the normative. Put in simplified terms, we often see what we are expected or supposed to see, and ignore or fail to see what we are not expected or supposed to see. Zerubavel (1997) calls this "optical socialization." This is a bit different from "seeing what we want to see" as individuals, as Zerubavel focuses on the social processes and social agreement which instruct individuals in selective attention. Zerubavel (2002) differentiates between explicit "conspiracies of silence" agreements about what can be seen and discussed, and more surreptitious and unacknowledged social processes that steer our attention and have the same effect, but are unnoticed by those impacted.

A topic that has received a substantial amount of attention in this field is the way in which the categories that we inherit and have at hand direct our thinking. Bowker and Star (2002) make the dual point that classification is a) a central and continuous human activity; and b) that once established and institutionalised, categories and classification systems exercise tremendous power over thought and action. We are, as individuals, to a great extent hostages to the myriad of classificatory systems that we more or less spontaneously employ in all daily activities, and the most powerful social institutions operative on the global level are also deeply rooted in more or less institutionalised classification systems. Though on the one hand arguing for the power of classification systems, Bowker and Star also point out that classification systems are rarely neat, that there are almost always grey areas, anomalies that don't fit in any category (other than "miscellaneous") or fit in several equally well, and that classification are human creations, not naturally given and thus, subject to contestation and revision.

The cognitive scientists Fauconnier and Turner (2002) examine what can be seen as the opposite, but not a mutually exclusive phenomenon, to that which Bowker and Star discuss. Fauconnier and Turner (2002) develop a theory of "conceptual blending." Conceptual blending is argued to be a universal, general and basic mental process that allows us to creatively and dynamically link discrete concepts. Though concepts and categories are not the same thing, the theory of conceptual blending underscores the creativity with which we

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<sup>7</sup> Boudon (1989, 1994), DiMaggio (1997, 2002), Howard (1995), Ridgeway (1997), Zerubavel (1997).

approach concepts representing phenomena in our social world and the profoundly complex activity that what on the surface appears to be simple, everyday thought is. The contrast between Bowker and Star and Fauconnier and Turner is akin to the structure, culture, agency debate in which the structural and limiting aspects are more extensively explored and emphasized by some (i.e. by Bowker and Star), while a critique of this rigidity is developed by others (i.e. by Fauconnier and Turner), making room for more dynamic, malleable, creativity and agency-favouring understandings. However, both pairs of authors include both aspects of structure and agency or conformity and creativity in their analyses, though with the contrasting emphases as drawn out above.

More directly germane to our interest in delusions is the work of Raymond Boudon. In *The Art of Self-Persuasion* (1994), Boudon set himself the task of explaining the social processes behind why people, often many, believe in false ideas. One of Boudon's basic observations is that in many cases people have good reasons for believing false ideas. False beliefs "can be reinforced by reality, rather than contradicting them" (p.14), especially if the criteria for confirmation are too loose, circular or the proposition is ostensibly not falsifiable as any contradictory example can be explained away and any seemingly confirming evidence is readily accepted as confirmation without scrutinizing the validity of the association. Ultimately, these good reasons for holding false ideas are not based on "valid foundations" (p.32). Boudon argues that the good reasons for accepting false ideas are *subjectively good*, that is to say they make sense to the holder and are usually based on convincing logical reasoning, but that these reasons are *objectively bad* as there is an errant, and often hidden, fundamental assumption. Drawing on Simmel, Boudon writes:

when we, whether scientists or laypersons, construct a theory to explain a phenomenon, we always introduce, as well as explicit statements to which reasoning is applied, implicit statements which do not appear directly in the field of our consciousness. ... Therefore, a theory – including a theory of our own – may *be* circular, but be *regarded* by us as linear because of the hidden presence of statements which are not only present in our reasoning, but are also, unknown to us, decisive in the formation of our convictions (p.56 original italics).

Reskin (2003) also elaborates upon the way that cognitive processes impact and impair our thinking in direct relation to gender inequality, one form of "ascriptive inequality."<sup>8</sup> One of the reasons why we are often incapable of detecting ascriptive inequality is that we tend to fail to make systematic comparisons that can lead us back to general mechanisms that produce inequalities. Or to use Heimer's (2001) terms, we apply biographical analysis rather than case analysis. Heimer distinguishes between two basic approaches to understanding relationships between things. When we think in terms of cases, we construct causation by thinking about relationships between or common to a series or number of things that are grouped together based on one or several common characteristics. In this sense we compare several like objects to each other in seeking explanation. When we think in terms of biography, we compare *within* the object, but over time. We seek an explanation that is immanent within the object – based on factors impacting it over time, its development or evolution. These two

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<sup>8</sup> Ascriptive inequality refers to inequality based on "ascribed" versus "acquired" personal characteristics. Ascribed characteristics are things such as race, ethnicity and gender – categories to which one is socially assigned based on primarily physical characteristics. Acquired characteristics are things like wealth, social class, education; characteristics which one has a greater opportunity to acquire or impact oneself, and thus affecting one's classification. Categories and classificatory systems based on ascribed characteristics are very powerful but not watertight, as Bowker and Star (2002) show.

fundamentally different ways of seeking explanations and producing information are, as Heimer points out, characteristic and appropriate in certain circumstances and operations, but as Reskin (2003) argues, often lead to misreading or misunderstanding other circumstances and phenomena if applied at the wrong time or to the wrong phenomena.

The importance of paying attention to cognition is pointed out by DiMaggio (2002: 275): “research on social cognition can help sociologists who study cognition and culture in a less obvious way: by helping us understand the sorts of biases that are likely to be built into the way we collect, perceive and interpret our data.” If one strikes “sociologists” from the preceding statement and superimpose “managers,” we see the basic purpose of this article – to help managers to a critical awareness of how they collect, perceive, interpret and act on information, and the limitations, biases and fallibility in the validity of information which at first and even second glance appears reliable and accurate.

Having sketched out the general cognitive processes I want to focus attention on – the processes that limit our ability to “think outside of the box”, I’d now like to turn to the basic substantive conceptions, assumptions, theories and bundles of ideas that lead most actors in our study a-foul in their understanding of the roles that gender plays in the sector and that I believe lie behind a number of the delusions I discuss below. These conceptions, assumptions, theories and bundles of ideas can be seen as forming a loose “cognitive map.”

The basic cognitive map of the sector that we encountered through our interviews in Ireland and Sweden is fundamentally *liberal*. Surprisingly little difference was found on this level between Ireland and Sweden. “Liberal” sums up a number of basic assumptions about the sector. The first is that everything is *individual*, the contrast here being to the significance of groups and group membership. This ranges from evaluations and rewards (e.g. the absence of collective bargaining agreements), to the onus on the individual employee to take responsibility for his or her career and skills development. Likewise, it is often up to the individual to work out when and how they are to get their work done within set parameters. In spite of the fact that work in the sector commonly takes place in (project) teams or groups, it is individual performance and contributions that are weighed in evaluations. Such a focus on the uniqueness of the individual is assumed to eliminate any considerations of ascriptive group membership. Second, the sector is also firmly committed to and believes that it is strictly *meritocratic*, that skills and competence (both technical and social) can be identified and relatively measured and are the operative selection and evaluation criteria. The “irrationalities” of prejudice are believed to be exorcized by the pressures of competition for best skilled employees obtainable, and their optimal use within organizations. This meritocratic orientation also explains the intense and universal dismissal of any form of quotas to increase balance in the sector. The third basic element is that the behaviour of actors within the branch is based on more or less unfettered *free choices*, within the general economic circumstances that indiscriminately impose themselves upon everyone in the company or branch. Action that is based on free choice is thus volitional, and traceable to personal motives. With regard to sex discrimination, this is capped by the “empirically founded” observation that there is no discrimination, or is very limited and isolated to a few primitive organizations or to initial meetings, but when distance is closed, stereotypes vanish. Thus *liberal* in the branch is both a normative notion (describing how things should be), and a cognitive description of reality – how it is. Agency is pervasive and structure only really makes its presence felt through general and universal economic, labour market and conjunctural factors.

The purpose here is not just to show *that* these assumptions are inaccurate, but that and how they inhibit actors within the sector from finding out and recognizing that they are not entirely accurate. It should be underscore that it is not arguing that there are no free choices, that individuality and individual evaluation do not play a central role or that merit is not the predominant selection and evaluation criterion, but that the assertions made above are of a *categorical* nature, backed up by the assumption of strong universal forces such as competition. Thus any aberration is self-detrimental and subject to elimination via exposure to competition (yet another basic liberal idea).

### *The Delusions/ Central arguments*

The delusion: The causes of imbalance within the sector lie exclusively in the pipeline, not the pool.

The somewhat cryptic title of this article expresses one of the first matters that perplexed us in analysing our data. Why did managers exclusively accord *inflow* into the sector causal importance in explaining the imbalance between men and women working in the sector, both explanatorily and in actions? The explanations of imbalance in the sector invariably referred to phenomena further “upstream” in the pipeline (the educational system) or even pre-pipeline factors (the cultural, some even mentioned biological, forces that channel boy into technical fields and inculcate in them interests in technology and girls away from them). It’s the educational system, its culture, it’s the choices of girls. Factors relating to the operation of the branch (the “pool”) were never brought up and associated with the imbalance in the sector. In fact when we asked the question as to why there is not parity in the branch, everyone concurred that that was a good question as this was an *ideal* branch for women to work in.<sup>9</sup> There are no hinders or barriers in the branch it was reported: its office-based (its clean and neat), it requires soft (social) as well as hard (technical) skills and knowledge, there is, relative to other technical and other engineering branches, a relatively high percentage of women, and the incidence of overt sexism and sexual discrimination is by all reports low, flexibility is pervasive in the branch and parental leave can be fit in between projects. If anything the branch has an image problem, it is not recognized how woman-friendly the branch really is.

Put succinctly, the cause of the continued imbalance is the “leaky” educational pipeline, in which girls and women fall off the technical and natural science track, and not a “leaky pool” or sector. Entrance *not exit* is the only recognized issue. The actions taken by companies to attract more women to their firms and into the branch also reflect this diagnosis.

The actions of management, which evidence a genuine interest in increasing the number of women in their organizations for a variety of reasons<sup>10</sup> reflect this inflow and not outflow

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<sup>9</sup> This assertion is made both in academic research as well as by our informants. Fondas (1996: 284) finds that parity between men and women in the sector *should* be achieved and cites Reskin and Roos (1990) in noting that conditions for occupational integration in the computer industry are uncommonly favourable, and cites Wright and Jacobs (1995) empirical survey work in finding that men have not left computer work as women entered the field, nor have wages or occupational prestige declined as more women have entered the field.

<sup>10</sup> The reasons for wishing to attract more women range from psycho-social work environment factors – the workplace is more pleasant with a good mix of men and women, to more performance related factors – mixed workgroups communicate and cooperate better; women have a more holistic view of projects facilitating planning and integration; women are less likely to be enticed to build the most sophisticated, technically advance

preoccupation. Most of the companies we were in contact with consciously did what they could to attract the best qualified women: they used pictures of women in advertising and testimonials on the recruitment pages of their web-site, sent women and men out to recruitment fairs, underscore in job advertisements that applications from women will be looked upon favourably, and one of the largest IT companies in Sweden even pays a higher finders fee to employees who successfully recruit women than men to the company. Companies were also active in the educational process, in forging links with secondary and tertiary educational institutions and see it as one of their priorities to show that this is a good career choice for women.

However, when it comes to what can be done within the sector, the flow of ideas tends to turn to two issues. The first is emphasizing the companies “family-friendly” policies, while underlining, especially in Sweden, that these are for the benefit of male and female employees. The second topic that frequently came up when discussing what could be done within the sector was the emphatic exclusion of one theoretical possibility – affirmative action or positive discrimination. This option was rejected across the board, by management and employees, men and women. Often even more forcefully by women, as they feared that *their* competence and skill would be more liable to be questioned if there was the remotest chance that they could be seen as the beneficiary of positive discrimination rather than having attained their position on merit.

Why is this a delusion? Isn't it true that the problems reside in the pipeline and not the pool? Of course the pipeline, determining the inflow into the sector is of tremendous importance. And attracting as many qualified women as possible is important and understandable, as is outreach to promote more girls to get into the pipeline and stop the leakage. But is it true that the pool doesn't leak, and why don't companies orient their action towards retaining the women they already have?

First, on the matter of the leaky pool. The leaks are not recognized, but the results are. At least anecdotally. One of the few women we interviewed over 45 with almost 20 years experience in the branch commented that she entered the branch with 10 other female close friends from her university course in computer science. All ten were equally as qualified and interested in programming as their male colleagues, but that over the years her female friends moved out of the branch, and she moved away from programming but remained in the branch. Her female friends did not leave employment, nor did they all move entirely away from technology, as many had positions in which they oversaw IT projects or divisions in non-IT companies. How did she explain this? She wasn't quite sure, but it probably had something to do with personal interests or not having female role models higher up in programming.

One of the findings of our research was the detection of a clear process whereby women are channelled into what we call “technology-plus” positions in the sector. Technology plus jobs are jobs that comprise both a technical component (architecture, programming, coding, or knowledge of systems) and a non-technical component, such as project management/leadership or jobs that were sometimes called “fuzzy” technical jobs such as testing and writing specifications. The overrepresentation of women in such positions was widely reported, as was the converse, the almost exclusive presence of men in “heavy,” “pure,” “leading-edge” and senior technical positions (i.e. chief technical officers). Although it was contended that these were different streams and not hierarchical levels, and that for

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(and thereby most expensive) solution but opt for the simplest functional alternative; women are more customer oriented and can and are willing to communicate with customers in a non-condescending manner, etc.

instance a good tester could earn as much as a good developer, and that project management did accord a degree of bureaucratic power, there was also an acknowledgement that being engaged with technology is what brings status and prestige in the branch, and that these other albeit necessary but more peripheral activities had lower status.

Women were channelled into these technology plus jobs in a number of ways. On the one hand, women were often seen as being “more qualified” for them because of their posited communicative, coordination or “people” skills, or their tolerance of “fuzziness.” On the other hand, we also detected a more insidious process. This had to do with getting on a pure or leading-edge/expert technical track, or a generalist technical or technology plus track based on *access to tasks*. Many women reported difficulty in and frustration over not being given the opportunity to work on the most advanced or interesting projects and tasks. Why this was the case was not readily discernible, but there was a feeling among them that they were systematically out-competed or out-manoeuvred for the most attractive tasks, not by all males, but invariably by *a* male. The cumulative effects of not being given the opportunity to prove one’s ability in meeting these challenges were clear enough. Those who had worked on such tasks were given more of the like, those who hadn’t, weren’t. Even women who have keen technological interests also landed up over time in technology plus positions, where they sometimes developed other interests, for example in management.<sup>11</sup> In other cases these women with keen technical interests begrudgingly accepted the management aspect of their job and continued to appraise the technical aspect as the most satisfying part of their technology plus job. While this evidence of tendencies towards occupational streaming (segregation might be too strong a term as there were many men, sometimes the majority in these positions) is alarming enough, there might be even more grave consequences.

If one looks at the sector in terms of core and periphery activities, we see a greater proportion of women in these peripheral activities.<sup>12</sup> Status-wise, it is clear that programming, architecture, development, coding, etc are seen as the core activities, with project leadership, testing, sales, writing specifications, etc as more peripheral activities. In terms of skills, one can also speak of core or sector-specific (programming/developing) and more general skills (management/client relations/sales). One can also see core and periphery in terms of who has contact with external environments and who is firmly entrenched deep in the lacuna of the organization. In these respects, those who have “pure” technical positions are at the core and most of the technology plus jobs are at the periphery (core and periphery should *not* be read as implying more and less *important* to the company). By moving a disproportionate number of women out to the periphery, potential exit from the sector and technical computer occupations is *facilitated* in two central ways. First, people in these positions develop skills and can document qualifications (project leadership and management) that are applicable outside the branch and occupations for which they were initially trained. Second, they are also brought into close contact with companies, positions and occupations outside the company or branch via their “externally” oriented jobs. This is a surreptitious social process making it easier for a proportionately larger percentage of women to transition out of the branch, though it is surely not an *intended* outcome. Promoting women into these middle-level management positions is frequently seen as a gender-equality measure, and often an equal number of such positions are

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<sup>11</sup> This is what really galvanized our attention to this phenomenon. In our interviews, several women in technology-plus positions continued to assert their “genuine,” “deep,” “burning” or “keen” technical interests and ambitions, and a begrudging acceptance of the non-technical aspects of their position.

<sup>12</sup> The tendency for women to engage in more “peripheral” activities in non-traditional or male occupations is also discussed by Bagilhole (2002).

allocated to women and men to “prove” the company’s commitment to promoting gender equality.

Here we have a coherent and proximate explanation of how the pool promotes leakage, based entirely on processes internal to the sector. What supports the delusion? One answer is that evidence of gendered social processes, like the “technology-plus” phenomenon, has to be produced. It has to be produced by someone expressly interested in the possible existence of such phenomena, that is to say someone who does not dismiss this very possibility out of hand directly based on other pieces of evidence. What we found repeated time and time again was the equation of gendered processes with overt sex discrimination/sexism. These two things were synonymous. If blatant sexism was present, a gendered process was present, if it wasn’t then sex or gender did not play a role. In this way, if one is searching (biographically in Heimer’s terms) for an explanation, and one did not discover blatant sexism, then there must be another explanation that isn’t based on sex or gender. From Zerubavel’s perspective, our attention is trained exclusively on one known manifestation, and if this is not found, our attention is turned to other known possibilities.

Uncovering such evidence also requires a comparative, case orientation, entailing access to enough cases and sufficient qualitative information to identify patterns as well as to be able to group entities as similar and different and similar and different in what ways. As Reskin (2003) points out, we often miss the commonalities that could make us aware of patterns readily discoverable if we look horizontally rather than vertically, or again in Heimer’s (2002) terms, case as opposed to biographically.

And finally, such discoveries require adequate resources facilitating such comparative activities. These resources are rarely put at the disposal of actors in the sector. A few individuals discretely raise the necessary questions, and anecdotal evidence is offered, but no systematic investigation is possible. Does this make it less of a delusion? No. Does this make it easier to understand why the delusion was not punctured by more complete knowledge? Yes.

Because patterns of inequality are not recognized only occasionally the outcomes are, as noted above, other delusions flourish, which also point the attention of people in the branch back to pipeline factors.

The delusion: Gender discrimination does not exist in our organization

As argued above with regard to the processes that lie behind the technology-plus phenomenon, gender discrimination does take place, but it goes unrecognised because it doesn’t look like gender discrimination. Gender discrimination, it was argued is solely identified with purposive sexism. Central to this way of conceiving discrimination is that it is motivationally and volitionally based. This is in keeping with the general liberal view of deliberate action and responsibility. However, as Reskin (2000) argues motivationally based discrimination is only one cause of discrimination, the most evident, but probably not the most significant, and absolutely the simplest to confront. The cognitive or intra-psychic bases of discrimination/differential treatment based on ascriptive characteristics is much more difficult to identify and arrest.

Though motivationally based sexism is, by virtually all accounts, quite rare, does this mean that differential treatment and discrimination do not take place? Two further findings from the project suggest that it does, commonly, but covertly.

Competence is not gender based, nor is gender involved in assessing competence, nor in distributing tasks and rewards it was argued by virtually everyone. How is competence assessed though? Through our interviews, it became evident that a frequent, and often decisive component (though it must be noted, not the sole component) in the evaluation of skill and competence is the perception of *interest*. How *interested* one was perceived to be in technology was in effect used as surrogate measure for technological competence. If one was perceived to be keenly interested in technology, then one was often accorded the most attractive and advanced technical tasks available at a given level. Interest was often gauged in ways that privileged males; it was gauged by how much “free-time” one spent with one’s computer, how willing one was to accept the existing general working set up for such jobs – i.e. isolation and spending all day cutting code, the extent to which one talked technology and to whom, and to some extent by how narrowly or exclusively interested one is in technology. Interest is, according to those we interviewed, a personal, acquired characteristic, not an ascribed characteristic, and thus a legitimate and individual, rather than group based characteristic. But if there are gender differences in how interest is expressed and discerned, then group-based ascribed characteristics seep into the realm of acquired, individual, intentional factors, which are legitimate liberal bases for evaluation and allocation. Thus, gender factors enter through the backdoor and with career influencing power.

The second gendered process also has to do with interests, but rather than assessment and evaluation, it has to do with the generative aspect – the way in which interests are fostered along gendered lines. To the casual observer, this process looks like a series of organizational opportunities and free choices based on personal preferences. However, we held enough interviews with women who had moved into “technology-plus” positions who stated that what they still primarily were interested in programming and systems architecture and that the managerial component was, at least initially, the least interesting and most frustrating aspect of their job. Women were often offered and encouraged to move into such positions for a number of reasons, they were assumed to have requisite and often superior communication and planning/coordination skills (soft/social skills) to their male colleagues, they were also assumed to be more interested in such “social” positions, there was an organizational need to fill these positions, and there was a general and more active resistance on the part of many men to leave exclusively technical jobs and assume these technology plus positions, especially in “flat” organizational contexts where technology plus positions were not seen as hierarchically superior positions. We found that the cultivation of interests and preferences can be conscious or unconscious, purposive and strategic or unwitting. Attention needs to be trained on how various groups or types of employees that bear certain traits or ascriptions are set to cultivate certain interests and then make according or appropriate “choices” of their own free will; choices that largely are the result of being subject to particular conditions (Correll 2004).

The delusion: the sector is particularly family-friendly due to temporal and geographic flexibility

Temporal and geographic flexibility is relatively quite extensive and genuinely appreciated by most everyone in the branch. In response to a standard question about what people like most about their work, flexibility, usually defined as the opportunity to decide oneself *when* one

wanted to do one's work, within given parameters and the respect and autonomy this was based upon and accorded, was almost invariably mentioned. So in this sense, flexibility, especially in its temporal incarnation, is both objectively and subjectively real (Fine 1994). There are however factors relating to flexibility that belie family friendliness. The first factor is that flexibility, allowing part-time work, flex-hours and telecommuting, comprise the basic elements in the package of family-friendly benefits. This package, these policies and real practices, usually coupled with overtime limits (primarily in Sweden, Ireland still has a long-hours regime) are what makes these companies, and the sector in general family-friendly, and ideal places to work for parents and especially women (mothers). What is not recognized is that and how this attractive package is impacted by other factors, most notably internal performance and rewards policies and what is generally referred to as "industry pressures." There is a symbiotic relationship between family-friendly policies and practices and performance policy and practices in reality, as well as the way "industry pressures" are blocked or catalysed as they enter the company, but they are cognitively separated. In other words, a company's understanding of itself as family-friendly or not is based on looking solely at the left-hand column of the balance sheet where the family-friendly policies and practices are listed. The right-hand column, the pressures, policies and practices that are in conflict and contention with the policies and practices on the left-hand side is not acknowledged as part of the same sphere. In other words, the balance sheet is not seen as a balance sheet, but rather two discrete ledgers that are rarely brought into interface with each other, and even more seldom in a systematic way. The cognitive process of compartmentalization is clearly evident here as for example family-friendliness and performance policies are two distinct spheres. Applying Boudon, one can say that the overall assessment of "family-friendliness" is based on only half of the equation – the presence or absence of the "positive," usual, generally acknowledged family-friendly policies, while omitting the other half of the equation – policies and practices that work against or erode the positive policies.

Academic research is beginning to explore the actual conflictual or neutralizing effects of these two "policy spheres" on each other – White *et al* (2003) find empirical evidence that certain "high performance" management practices have detrimental impacts on work-family outcomes, and probably counteract much progressive "family and women friendly" sets of policies and practices without such a connection being recognised. Thus it is possible for a company to offer a full battery of family-friendly policies without increasing its actual family-friendliness if countervailing forces, policies and practices are not checked. Why this discrepancy arises and remains often unchallenged has to do with categorization – what goes into the family-friendly equation and what remains outside, what is classified as corporate policy and what is "industry pressures," what is personnel policy and what are performance and review practice. Furthermore, flexibility is also recognized to be a two-way street as well. When project deadlines approach and time is tight, give becomes take, and it is the "industry" or the company that dictates, it is the employees that accommodate, and their families that become the site of flexibility.

#### A cognitive omission: Unacknowledged flexibility

The tendency for proportionally more women to move into technology-plus positions, either purely on their own volition or by having their interest in such positions organizationally formed or formed by managerial action brings us to a point about the unacknowledged flexibility of female labour in the sector. Again, this can only be seen comparatively. What emerges is a pattern in which relatively larger numbers of women move into positions that are

organizationally important, but often difficult to recruit to. Getting people trained to be engineers and computer scientists to assume tasks that pull them away from these tasks was a commonly expressed difficulty in many of the companies in our study. Resistance towards moving into such positions was *generally* stronger among men than women, especially as technical work was universally accorded higher status and management, customer contact, writing specifications, etc. had lesser status. Moving into a technology-plus position was an occupational shift – one was both moving into a new area, where new skills were required, and one was moving away from *what one was trained for* and the purpose of pursuing a career in this branch. Furthermore, there was a widespread concern that such an occupational shift or transition would mean falling behind in technological knowledge and relative competitive ability in a dynamic technical environment and labour market. In other words, taking a step in the technology-plus direction, leaving the realm of pure technology was the first step on a one-way path or a slippery slope.

Women, relative to their overall numbers in the sector, filled such positions and undertook this occupational shift to a greater extent than men. This exhibits a double flexibility – a flexibility in terms of one’s own career ambitions and preferences, and a flexibility in meeting organizational needs. Why wasn’t this recognized, and rewarded as flexibility, a concept frequently used within the sector?

One reason is that flexibility is conceived in temporal and geographic terms, and only to a restricted extent in functional terms. The most common understandings of flexibility in the sector have to do with time, especially with regard to when work is carried out. The second primary aspect is geographic, again most common in terms of where work is or can be carried out – at home, in-house, at the client’s site, etc. There is a coupling of the term to function – what it is that people do, but this is usually in terms of being a technical generalist, that is someone who is good at a broad range of things (platforms, applications, programming languages, etc.) rather than being an expert of specialist in a particular area. However, occupational flexibility is not recognized as flexibility. One reason could be because it is seen as embarking down a one-way street, and thus an important aspect of flexibility, the opportunity to move back and forth, is absent. Another reason is that the term is already strongly and virtually exclusively associated with factors (temporal and geographic) that are quite different from and more elementary than occupation. A further reason is that moving into such positions is deemed to be a natural choice based on inherent preferences, and not something that is situationally contingent and negotiated. The choice is not part of a contextually indeterminate situation in which accommodation is offered by one part or the other. Occupational transition is seen as a choice in which one acts on preferences in the face of an opportunity. In other words, the terms in which we normally conceive flexibility precludes seeing functional flexibility – or the particular functional flexibility of female labour as flexible as it is either seen as filtering in to where it is right or best suited – areas where “soft-skills” are most important, or because this kind of “flexibility” is not seen as flexible because it is seen as a matter of temporary choice; and not a matter of doing something to fill a given need at a particular point in time, then to *return* to its “normal state”.

### *Conclusion*

The purpose of this article is twofold. The first is part of the gender equality agenda – to make managers (and employees alike) aware that gender does in fact play a significant, but unacknowledged role in the organizations we studied, which we posit are representative of not just companies in the IT sectors of Ireland and Sweden, but also most high technology, high-skill, companies. The other aim is much wider, namely to focus attention on more universal

cognitive and intra-psychic processes that contribute to our subscription to delusions in general. Possessing delusions, Boudon assures us, is not an expression of irrationality. Granted, the days of managers and academics alike are filled with more trivial and more significant activities than testing the innumerable assumptions that our everyday lives rest upon to see if they are in fact delusions. However, in recognizing the ease with which we subscribe to notions and assumptions, especially if they come in coherent packages that accord with and are confirmed by “what we see everyday” in the world around us, we might be less apt to dismiss challenges to our well founded delusions. Likewise, in challenging delusions, one should not just be able to put up a better competing theory, but also explain why the delusion is plausible, as well as why the challenge is plausible. Both delusions and their substitutes are usually based on empirical arguments. One needs to show why one empirical argument is better than the other. What will be interesting is to see what happens or what people do when presented with compelling evidence that the delusions they subscribe to in fact are delusions – in that there is a stronger, more complete or more accurate description of a phenomena or situation.

What can be done? What can, and should managers do? Aside from an awareness of and sensitivity to the outcomes and processes presented here, managers should be more disposed to see structures and social factors at work in their organizations and sectors. Managers should also have an increased sensitivity to how one’s position and the resources and activities that one engages in restrict one’s knowledge and make certain assumptions or predispositions more subject to confirmation than falsification and modification. The continuing *interaction* between the normative level, what we want or would like the person, organization, sector, or world to be, and the cognitive, how we believe to actually is, is important and needs to be recognized. As Zerubavel tells us, these are not two distinct realms in practice, but rather cross-fertilize each other. Finally, Reskin (2000) argues that biasing cognitive processes cannot be “corrected” in individual minds, but rather organizationally counterbalanced: “the proximate causes of discrimination are the contextual factors that permit or counter the effects of these habits of the brain.” This calls for the creation of organizational procedures and routines to detect, check and counter these “normal” cognitive processes that frequently result in differential and discriminatory treatment. As Anderson (2004:739) points out, “Individual, fallible people carry out recruitment and selection” and all other managerial functions. The intent of this article is not to make us infallible, but rather to point out general mechanisms through which we are fallible or frequently fail, especially in terms of how we subscribe to, profligate and act upon delusions and the consequences this can have on organizations and lives. Through awareness or what above is called the cognitive process of attention, it is hoped that we become more able to confront and organizationally deal with our limitations and more open to contentions that challenge “accepted and proven truths.”

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