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# Review of 'Gender Codes: Why Women are Leaving Computing' edited by Thomas J. Misa

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**REVIEW**

> I still think, of all the fields open to women, computer science is the most wonderful one. First of all, as a programmer, no one knows what sex you are, what color you are, what your gender preferences are; they just know: Does it work or not? Did you get it done? Is it fast enough? And therefore, it is *the* field where you are judged by the output – that's it. … So I love it for women.

Women have not always been absent from computing, nor do they necessarily reject it today, as this quotation from Thomas Misa's (2010) edited collection, *Gender Codes*, indicates. In the mid 60s, they entered the field in large numbers. By the late 80s, they made up 38% of the US computing workforce. This was quite untypical of other technical professions – chemistry, physics, engineering – which men soundly dominated. Not so computing. There were proportionately more women in computing than anywhere else in the engineering world. However, in the mid 80s, their presence diminished on a scale unprecedented in any other profession. Why? What happened to put women off, to reduce their representation from over one-third of the computing workforce to the one-fifth of today?

In *Gender Codes*, Thomas Misa and his contributors examine the patterns, timing and reasons for women's exit from computing. It appears that, in the USA today, women spend about ten years in the business, before they drop out, subtly or more explicitly "pushed or shoved out by macho work environments, serious isolation and extreme job pressures" (Hewlett et al 2009). Moreover, the attrition of women in mid-career closely matches the downturn in female participation in computer science degrees, so that both may reflect a broader social or cultural shift that the book sets out to reveal.

We know much about the gender culture of computing through the work of authors like Judy Wajcman. But we know less about how and when this gendered culture emerged. Misa argues that a better understanding of this culture is crucial to designing and targeting effective interventions. After 30 years of patchy, under-resourced, voluntary, and ill-connected measures which overall have made little difference to the participation levels of women in IT (in the UK at least), we certainly need to know where the best interventions can be made.

Several of the book's chapters illustrate this hypothesised cultural shift with rich case study data and superbly chosen archival photographs. The first part of the book concentrates on the exclusion or expulsion of women from skilled computing work in the middle of the twentieth century. According to Haigh, data processing in the 1950s was a strongly feminised occupation, but managers soon strove to professionalise it, which meant separating the male-dominated punched card machine operation – a 'tiny island of male craft work in a sea of low status female office labour' (Haigh 2010: 56) from the female-dominated office work (under-valued, dead-end work). They did so partly through the establishment of professional associations which encapsulated their aspirations to management status. This meant breaking the association with technical, craft-based masculinity and shaping for themselves a different class/gender identity more strongly rooted in white-collar administration.

The dominant pattern in advanced computerising countries in the early-mid twentieth century was one where men dominated skilled machine operation, and women were clustered in keyboard-based work punching cards. The chapter by Schlombs shows that in Germany, however, the latter was men's work and carried out in a separate location from the remainder of the office. Changes in the division of labour associated with technological change were largely shaped by pre-existing organisations of work. In other words, power relations and divisions of labour shape people's relationships to technology, though, crucially, the gender-technology relation is also fluid over time and space.

Power also shapes people's access to skilled status. British women dominated programming work in the Civil Service in the immediate post-war period, though they were employed on 'Machine Grades'. In the 1970s, however, those in feminised occupational grades, including these machine grades, were excluded from applying for upgrading to the new Automatic Data Processing grades for programmers and systems analysts, and so they were stuck in an occupational and gender ghetto, and their skills systematically under-valued. Of course, women's skills are under-valued in many jobs and not only in computing occupations, but these stories illuminate the moments in which, and processes whereby, women begun to be excluded from skilled status in computing work specifically, and the field became masculinised.

These explicit processes of exclusion and the more subtle under-valuing of women's skills appear to have been reinforced by processes of cultural transmission taking place elsewhere. Corneliussen's paper focuses on the messages emanating from the

Norwegian newspaper *Aftenposten* between 1980 and 2007: men were presented as computing experts, women as largely inept. With the more recent growth in home computing, the portrayal of inexperienced users as invariably female has, if anything, been underscored in the media. Similarly, in the advertisements published in the Greek journal for home computing which are analysed by Tympas and his colleagues, the images of women operating computers are consistently focused on their office functions (working at the screen, hands on the keyboard) while those of men are more managerial (directing operations rather than doing them). These 'gender-marked images' continue to be promulgated despite the fact that in Greece, women are better represented in computing education at tertiary level than they are in many other countries, including the US. Depressingly, despite their significant educational attainments in computing, Greek women do not outperform their American counterparts in the labour market – both invariably find themselves in office-level positions. It is probable that the advertisements play an important role in shaping the attitudes of recruiters towards women in computing, but what of the women themselves? Are their own self-images similarly undermined?

The final section of the book is devoted to action rather than analysis: the implications of the research for practical interventions. It is also, in places, much more optimistic. Abbate's chapter is insightful for the perspective on women's relationship to computing which she offers; her chapter celebrates the joy, enthusiasm and sheer fun which many ICT women derived, particularly in the early days of computing, before gender labels were attached to it and to the skills deployed by women leading in the field. She reminds us that women's pleasure in computing is under-explored in comparison to accounts of isolation, hostile culture and hypercompetitive environments. Were these women's positive experiences historically exceptional, or surprisingly common? Posing this question reminds us that of course women are diverse, and they do not have the same experiences of computing. A more nuanced approach to the gender aspect of the gender-technology relation is clearly vital if our analytical models are to be able to make sense of the obvious disparities in different women's experiences.

As Abbate points out, and the different chapters of the whole book demonstrate, gender is socially constructed and reconstructed, and the gender codes of particular professions are not static. In computing, as in other professions, they are embedded in media representations, job descriptions and recruiting, educational practices and workplace culture, which women draw on and respond to in the process of establishing their own orientations to computing.

Yet today in many countries (not all), the structure and culture of computing professions clearly deters a very significant proportion of women from studying or working in the field, and I think this goes beyond a 'male-biased image' of computing which is at the centre of this book's focus. In the final chapter, Hayes suggests as much when she concludes that the 'nerd' image also applies in other fields, such as engineering and physics, in which women's participation is increasing. So what is different about computing? In any case, we might also ask if the 'nerd culture' is still really a significant deterrent to women, now that computers are ubiquitous - and, still more so, we might add, mobile devices and social media? (Beyond the obvious observation that using computers and social media is not the same as creating them, this issue probably deserves more attention than it has yet received.)

Yet finding answers to these questions is surely the key to understanding how to design and where to target policy and practical interventions for change. Here I

regret that the practical interventions suggested in the final chapter by Hayes turn exclusively on the issue of changing the *image* of computing. Perhaps it is an unfair demand to place on a book which focuses on the increasingly dominant symbolic and cultural associations with (a particular form of) masculinity that it concern itself with the possible structural remedies to gender inequality in computing studies and careers - curriculum change, different employer practices in recruitment, progression and working time arrangements. Yet if we do not focus on changing some of the real conditions of computing work, as well as its public image, then we risk encouraging women into a field which many find difficult to enter, frustrating to work in, and painful to experience.

## REFERENCES

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