

Gender and IT: do stereotypes persist?

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Abstract

The media depiction of IT users being predominately male was reported by Ware and Stuck in their 1985 paper “Sex-role messages vis-à-vis microcomputer use: a look at pictures”. Much has been written in the intervening years about gender and IT, and in a climate of declining proportional representation of women in IT, the effect of media portrayals is recognised as a powerful yet under-investigated influence on career choice. This paper replicates part of Ware and Stuck’s study to report whether stereotyping of computer and IT use in teenage magazines persists. Current statistical information on gender and IT enrolments in Australian secondary schools and higher education institutions is presented, as well as the findings of the analysis of pictorial representations of IT use and application in teenage magazines. This Australian study found that pictorial representations in advertisements and articles in computing magazines are gender-balanced and did not find the stereotypical representations that were evident in 1985. However, stereotypes appear to persist in gaming advertisements and the absence of depictions of computer use or advertisements in the most popular girls magazines could be construed as stereotyping of IT as male.

Keywords: information technology (IT), gender stereotypes, media.

1 Introduction

In 1985 Ware and Stuck [18] analysed the pictorial representation of men, women, boys and girls in popular computer magazines and concluded that stereotypical portrayals were evident. Their longitudinal analysis of three personal computer (PC) magazines found that men were depicted twice as often as women, women were overrepresented as clerical workers and sex objects, and that men were more likely to be represented as managers, experts and repair



technicians. Women were more often depicted in a passive role while men were depicted more often in a position of authority. Importantly, only women were shown as sex objects [18]. While they did not make a causal connection between computer magazine portrayals and the reluctance of girls to pursue IT careers, a concern was expressed about continued stereotypical representation of IT as a male domain as a contributing factor to this perceived reluctance. This current study conducted almost twenty years later, analysed pictorial representations in the two most popular computing magazines in Australia. This initial analysis raised questions regarding readership demographics and led to the study being widened to include an analysis of the two most popular teenage-girl magazines. The purpose of replicating Ware and Stuck's methodology was to determine if mass-market magazines are still stereotyping information technology (IT) as a male domain through their pictorial representations in 2003, just as they were in 1985. The influence of stereotypical representation of IT in the media, and its effect on the career choices of young females will be discussed.

The field of IT continues to be more attractive to males than females in 2004, just as it was in 1985, despite many programs in USA [7], Australia [6], and UK [8] that were implemented and funded by governments, universities and various other bodies to reverse or ameliorate the male dominance of the discipline. These programs included advertising and promotional materials to attract females to the discipline, as well as other marketing strategies. Many have targeted females in secondary schools and produced short-term gains in enrolments or perceived changes in attitudes, but none of the programs have grown to be self-sustaining and reversed the current trend, as indicated by the enrolment statistics presented in the next section. The trend of females not embracing IT to the same extent as males is contrary to trends in higher education in general. In most western countries females are the majority on campus, and in recent years, are more than half the new enrolments in previously male-dominated disciplines, such as Medicine, Law and Veterinary Science [2].

Several reasons have been put forward as contributing factors to the gender imbalance of the IT discipline, and stereotypical media representation is one of them. This paper will present an overview of current enrolment statistics in IT in secondary and higher education in Australia as well as discuss the media's influence in perpetrating stereotypes. In presenting the results of this study, some observations will be made regarding the implications of the findings and suggestions for further research.

2 The gender imbalance in IT in Australian education

The proportion of girls studying IT at both tertiary and senior secondary school level in Australia is in decline. The Victorian statistics for the senior secondary school courses named Information Technology show both a decline in numbers of students studying IT (from 64000 in 1994 to 54000 in 2003), and a decline in the proportion of girls enrolled in these subjects [16]. The proportion of girls enrolling in IT courses has declined from 48.1% of the student enrolments in 1994 to 32% in 2003 [16]. In higher education, proportionally fewer females



than males are selecting IT courses, but unlike secondary schools, the actual numbers of girls choosing IT has increased.

The broad classification provided by the Department of Education and Training (DETYA) divides the discipline into the four main areas of Computer Science and Information Systems General (CS & IS Gen) not including Business Data Processing, Computer Science (CS), Information Systems (IS), and CS & IS Other (CS & IS other) [2]. Figure 1 provides a closer look at higher education participation figures in the each of the categories of the discipline over a ten-year period.

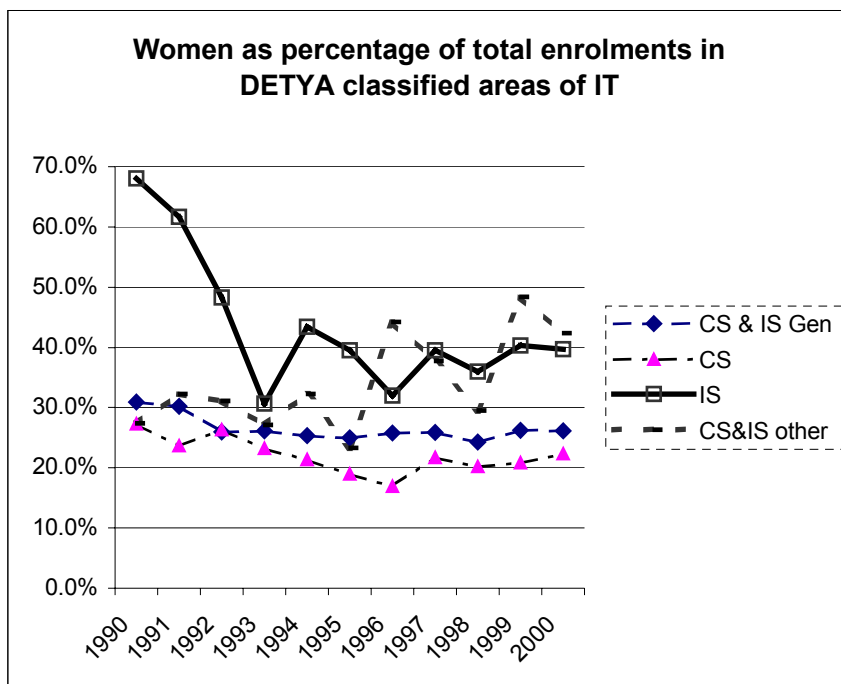


Figure 1: Proportional enrolments of women.

While proportional participation by women has fluctuated within the specialisations of the discipline (Figure 1), men are increasingly attracted to these degree courses at a much greater rate than women. The graph indicates a marked decline in the participation of women in IS yet in reality the actual number of women enrolled almost tripled (927 in 1990 to 2,599 in 2000), but male participation increased at a much greater rate (1,077 in 1990 to 5,625 in 2000). The proportional participation of women in Computer Science (CS) has declined by several percentage points, while in fact once again the number of women have more than doubled (1,084 in 1990 to 2,694 in 2000) [2]. These statistics display a trend of gendered differentiation in enrolment in IT, and raise

the concern that some female secondary school students may be closing doors to potentially rewarding IT careers at an early age. Girls are choosing IT courses in higher education in greater numbers than the past, but still well below the number of boys that are attracted to the discipline.

The reasons why girls are not choosing IT courses to the same extent as boys are not clearly evident. While a direct causal link between pictorial representations of people in IT and career choice cannot be proven, accepting that the media appears to have a great influence on affecting student career choice is gaining currency in the literature [7,8,14] and is a premise assumed by this research. The influence of the media in creating and perpetuating gender stereotypes is discussed in the next section.

3 Media and gender stereotypes

There is a need for more detailed analysis of the factors that encourage an interest in the IT discipline and what part the media play in creating perceptions about the career path by replicating stereotypes. Ware and Stuck found that computer magazines are predominately produced by males, for males, and portray the images of males using, designing and spending their leisure time on computers [18]. Recently Margolis and Fisher concluded that non-computer teenage magazines produced for boys have many more advertisements for computers than those published for the teenage girl market [7]. The effect of these portrayals and the effect of popular film and television characters portraying female lawyers and doctors with equal status and power to their male counterparts (*“Legally Blonde”*, *“ER”*) on influencing young girls’ career choices also needs further investigation. Stewart-Miller claimed that the power of the media is very important in helping young females identify with a sub-culture, and in perpetuating the gendered nature of IT being male [14].

A recent study in the UK of the ICT (Information and Communications Technology) industry concluded that

“The image of the ICT industry amongst the general public may well be shaped by media influences. The two sectors most commonly mentioned as desirable to work in are portrayed in popular television dramas, such as *Ally McBeal*, *This Life*, *E.R.*, *Casualty*, etc. There is a lack of similar positive role models for the ICT industry on popular media.”
p. 5 [8].

The same report emphasised the importance of promoting role models of every day people with difficult circumstances who have been successful in IT, to ameliorate common perceptions of IT as a male industry [8]. Susskind [15] suggested that to counteract all existing stereotypes there needs to be affirmative action in portrayals. This USA based research found that “children expect people to act in a stereotypical manner” [15], p. 492, and concluded that to increase “gender flexibility” children need to regularly see both sexes participating in non-traditional roles [15].



Jewell reported in an Australian study that “Females appear to be rejecting involvement in information technology not because of their perception of what it is but because of what it is not” [6], p.301. Their perception of what it is not (personal, human contact etc) is supported by media portrayals of IT being a haven for geeks and nerds [14]. Jewell surveyed five hundred Australian female undergraduates in 2000 about their attitude to IT, and 25% stated that they were misinformed and that with better information they would have chosen IT careers [6]. It is assumed that misinformation came from a variety of sources, including the popular media.

Researchers give argument to the need for aggressive counter-stereotypical marketing by IT bodies, governments and universities to entice more girls study IT [7, 8], but as Susskind concluded, any interventions may be a “drop in a bucket” because stereotyping of gender does not occur “in a vacuum”. There is a need for sustained and covert interventions over long time periods [15].

Morrison and Shaffer investigated gender perceptions and the influence of stereotypical portrayals in advertisements [9]. Their “gender-role congruence model” predicted the effectiveness of advertisements based on gender-role orientation of viewers. This research added validity to the argument that IT vendors market to boys and males because they are their major consumers. Newman et al. [11] investigated patterns in children who were considered comfortable with their gender, and how they reacted to computers. This research concluded “Gender constant girls with high levels of gender knowledge liked working with computers less than participants in any other subgroup” [11], p. 337. The authors posited that changing negative attitudes based on gender schemata is a complicated and involved process [11], p. 338. Supporting this position, Bouchard and St-Amant [1] found that girls resist stereotyping to a greater degree than males (44% compared with 88%) and those from families that are inclined to less social conformity, often experience greater success. They recommend that education encourage girls and boys to critically challenge gender assignments and assumptions [1].

These studies support the premise that stereotypical representations influence children’s behaviour and choices. There is considerable evidence of stereotypical representations in the media of IT being a male domain [7,14,18]. This is considered a contributing factor to the reasons why girls are not choosing IT to the same extent as boys [6,8]. Our study will investigate whether these stereotypical portrayals are still evident in popular mass-market magazines in 2003.

4 Research design

The methodology defined by Ware and Stuck [18] was replicated as much as possible. This required analysing a selection of computing magazines to count and classify the number of pictorial representations of people and IT presented in both advertisements and articles. There was some deviation from their original methodology as will be explained. A longitudinal analysis of IT magazines was excluded, because the initial two editions analysed were determined to be typical



of the medium, based on the experience of the researchers. After this initial analysis and a discussion about the demographic profile of the typical reader, teenage-girl magazines were added to the study to determine if they contributed to the stereotypical portrayal of IT being a male domain. The researchers had a lack of familiarity with teenage-girl magazines, and so a longitudinal analysis was carried out because it could not be determined if the two initial editions analysed were typical of the medium.

The magazine titles were selected from the readership results for the year ending 2003. This was obtained from the website of a large research survey company in Australia, Roy Morgan Research [12]. The two highest selling magazines marketed for teenage girls were easily identified, as were the most popular personal computer (PC) magazines. The PC magazines reached more than 670,00 readers in 2003, the teenage-girl magazines had a readership of more than one million in the same year. The four magazine titles selected were clearly the most popular of their genre [12].

After an initial analysis of the magazines to classify the categories of portrayals as provided by Ware and Stuck (expert, manager, clerical, teacher, learner, repair technician, game player, sales, sex object), additional “Game Setting” and “Game Character” categories were added to allow a more accurate classification. Several sweeps were taken through each magazine (total pages = 1987). The first to identify pages with IT and human beings (or human body parts). The first researcher then took a second sweep to classify each representation. The second researcher classified each representation without being aware of the first researcher’s results. Finally a joint comparison of classifications was undertaken to compare, affirm and deal with discrepancies between the classifications. This will be discussed in more details in the following section.

5 Results

In this section a detailed description of media portrayals in magazines will be presented. Where possible demographic profiles of magazine purchasers will also be provided.

5.1 PC magazines

Australian *PC User* is the highest selling personal computing (PC) magazine in Australia with a reader profile that is 80% male, the majority of whom are in managerial positions, work full time and have a home personal computer [12]. Only seven advertisements or articles pictured people and computers. Of these there were slightly more males depicted than females. Two males and one female were in obvious managerial positions, one female student and one male clerical worker were also depicted. The group depictions showed an apparent Internet savvy family and a group of young upwardly mobile shoppers keenly waiting for a sale to start. The second magazine analysed, *PC World*, is the second highest selling PC magazine in Australia [12]. A readership profile was not available.



This magazine had many more depictions of people than the previous one analysed, and slightly more females than males depicted (by one). Men were depicted in business settings only once more than women, two boys were depicted (game players) and one girl (student). A game advertorial portrayed female combatants with overly accentuated curvaceous body images. On two occasions females could be construed as sex objects (i.e. only there for their smile (keyboard advertisement) or their body (screen shot of female sportswoman) but this was not consensus between the two researchers. Ware and Stuck's definition of sex object is someone who appears to be in the picture for his/her sexual or physical characteristics [18]. One researcher (male) believed this classification could be applied to a young male in an advertisement, the depiction of which was accepted and overlooked by the other researcher (female). After discussion it was agreed that the only agreed sex-object portrayal was the female sportswoman.

5.2 Teenage-girls magazines

Dolly is the highest selling teenage girl magazine in Australia with a readership of 463,000 in 2003 [12]. Six issues were analysed from January 2003 to January 2004. In all issues there were at least three pages of advertisements for ring tones and images for mobile phones, but no depiction of computer use at all. There was one editorial on 'cam girls' which interviewed girls who use web pages for diaries including a warning and story of one who was murdered. Two issues of *Girlfriend*, the second most popular teenage-girl magazine were analysed producing almost identical results. There was however one profile of a young girl who maintained her own web page, but at no time was there a depiction of a girl using or buying a computer or computer part.

6 Discussion

The outcome of this analysis is that males and females are depicted as IT users and buyers in almost equal numbers in PC magazines, and that there is no pictorial representation of IT use in any of the teenage girl magazines. There was repetition of advertisements in the PC magazines. Both PC magazines depicted males and females in positions of power (i.e. managerial, or in control), however only young males were depicted as game players. As previously mentioned, there was a disagreement on the classification of a male in an advertisement being construed as a sex object, indicating the uncritical acceptance of males in computing advertisements by the first researcher (female).

6.1 Game Representations

As noted earlier, additional categories of "Game Character" and "Game Scene" were added to the original Ware & Stuck classifications. In the PC magazines examined, several depictions of computer game characters and computer game settings occurred. Game setting and character depictions were generally militaristic in nature. One advertisement for a computer sound system showed a



squad of soldiers attacking a fortification. One magazine showed a scene from the popular game “*Grand Theft Auto: Vice City*”, with the avatar armed with a large pump-action shotgun stalking the city streets. A third depiction had two female soldiers armed with large weapons, dressed in futuristic body armour, with bare midriffs and exaggerated physiques (large breasts, minimal waist).

A number of studies have shown that game preference and console ownership are gender biased toward males [5]. Games remain a largely male-dominated domain, and the media depiction in the magazines sampled would seem to correlate with this perception: the only female game characters present are both armed and sexualised. However, recent data released by the Interactive Digital Software Association in the U.S. has shown that the number of female game players is approaching 39% [10], although many of the games played (such as Hearts and Solitaire) are outside the milieu of the corporate game industry. There was an absence of any IT or console game advertisements in any of the issues of the teenage girl magazines.

6.2 Absence of representation in teenage girl magazines

As noted in the findings, there were only two depictions of IT use in the teenage girl magazines. On a second sweep through these magazines it was noted that their main focus was fashion and popular culture. While there was an absence of depiction of other careers, there is much implication of possibilities. Each of the magazines had at least three pages of advertisements for mobile phone and ring tones, and many of the contests in the magazines had mention of entering via the Internet. This confirms earlier studies that girls use IT almost in equal numbers to boys, but their use is primarily as a communication tool [8, 7, 14]. The teenage-girl magazine cannot be overlooked as a medium to reach girls and raise their awareness of IT as a potential career path.

7 Conclusion

This research replicated the Ware and Stuck research from 1985 to determine if gender bias was still evident in selected print media in 2003. While there was evidence of some stereotypical representations of females in the new category of games, the depiction of males and females in IT magazines was found to be almost equal with no obvious stereotypical representations. Both genders were depicted as users and purchasers. The results of this research imply that there is a more balanced depiction of males and females as users, managers and purchasers of IT products in 2003 than in 1985. This could be a reflection of a more enlightened society as well as a result of equal opportunity laws and policies in advertising. The magazine readership profiles indicate that few girls read PC magazines and in games advertisements, advertisers are responding to a market driven economy. The lack of game playing advertisements in the teenage girl magazines does not reflect the growing popularity of this activity with young girls. The paucity of portrayals of IT use or advertisements in teenage-girl magazines highlights that there is a potential for using this medium to lift the



profile of IT as a career option for young women. It implies that more aggressive advertising could be employed to attract females to the discipline, as recommended by the MORI study in 2001 [8].

This research only scratches the surface of the role of media in influencing future career paths and could be extended to include film and television portrayals. There is a potential for further investigation into the increasing participation of girls in the gaming genre. The title of this paper asks if gender stereotypes persist. The answer from this study is not clear-cut. While there is not the clear stereotypical portrayals that Ware and Stuck found, the stereotypes are portrayed in gaming advertisements, and the absence of IT advertisements or promotion in teenage girl magazines could be construed as a product of stereotyping embedded in society's beliefs that IT is male and not of interest to young girls.

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Magazines used in study:

Dolly ACP Publishing, Sydney, Australia. Editions: 382,388,389,391,392,399.
Girlfriend Pacific Publications, NSW, Australia. Editions: Feb.2003, Jan.2004.
PC User ACP Publishing, Sydney, Australia. Vol.16 No.1.
PC World IDG Communications Pty. Ltd. NSW, Australia. January 2004.

