

Research Briefing No.6

Screening women in SET: how women in science, engineering and technology are represented in films and on television

There are major issues around training, recruitment, retention and promotion for women in science, engineering and technology [SET]. Girls and women are less likely than boys and men to study SET subjects both at school and university. Even after training women are less likely than men to develop a career in SET and to be promoted to senior positions.

Although there are many factors influencing such gender segregation and inequalities this briefing focuses on the role played by the mass media. The study explores how different outlets and genres might allow for different portrayals of women in SET, and reflects on the potential for developing more positive representations in the future.

This briefing is based on a study led by Dr Joan Haran (from Cesagen, Cardiff University) and a team from the School of Journalism, Media and Cultural Studies, Cardiff University. The team wrote four of five reports commissioned by the UKRC to explore the media's role in representing women in SET.

The briefing focuses on representations of women scientists in films and in TV drama, drama-documentary and documentary programmes. 60 programmes, films, or episodes were examined including *The Net*, *Hackers* and *Flightplan* (Films); *Silent Witness*, *Waking the Dead*, *CSI* and *Bones* (TV drama series); a drama-documentary called 'If'; and mainstream documentary – *Horizon*. There were interviews with 15 people involved in producing the TV programmes (e.g. editors and scriptwriters). Additionally, the study drew on interviews with women scientists, focus groups with men and women viewers and on-line discussions about particular films and programmes.



Key Findings

- It is important to recognise differences between different types of media rather than generalising about how 'the media' represent women in SET. For example, there are differences between fact and fiction, print and broadcast, and crime drama and comedy.
- The representation of women in SET is influenced by a complex interplay of economic structures, production values and practices, as well as negotiations between the production team. Different forces also come into play in the process of commissioning, writing, casting, and developing a documentary or drama series over time.
- Female scientists rarely feature in factual reporting but have more prominence in fictional media. For example, male scientists dominate documentaries such as Horizon (six male experts appear for every one female expert). However, women scientists feature prominently in drama programmes such as Silent Witness and Waking the Dead. Such fictional representations are widely viewed as positive and pleasurable. They attract attention to women in SET, have built up loyal followings and can be inspirational.
- Gender stereotypes are reproduced in some films which focus on the personality of the female scientist but are less evident in more 'realistic' TV drama series (such as Waking the Dead). Stereotypes are also less likely in programmes which focus on the science rather than the scientist and which feature real women. For example, the Horizon documentary series represented a range of female scientists in non-stereotypical ways.
- Certain types of programmes are more likely than others to present science itself in diverse and 'realistic' ways. The episodes of Horizon that we examined, for example, showed a range of career possibilities. They presented the viewer with diverse motivations for pursuing an interest in SET; ranging from scientific curiosity to caring about people or the planet. They also displayed the international and interdisciplinary cooperation and teamwork involved in many SET enterprises. These dimensions were particularly welcomed by many women in SET as promoting a more attractive and realistic image of their field. They challenged the typical narrative which presents a driven scientist making 'breakthroughs' in isolation.

It is important to recognise differences between different types of media.

- The division between 'fact' and 'fiction' is not absolute – some of the most appreciated female characters in drama have been based on real scientists and this has helped develop rounded, and non-stereotypical representations. For example, both 'Sam Ryan' in Silent Witness and 'Frankie' in Waking the Dead were based on real women, and their experiences helped inform the drama.
- Writers who were involved in creating Silent Witness and Waking the Dead were acutely aware of the challenges that professional women might face in a workplace imbued with a masculine culture. They expressed a strong commitment to representing strong, professional women. However, they also usually wanted to avoid any suggestions that they were being 'politically correct' or writing to an agenda. They stressed the importance of 'realism' and the need to represent characters as flawed and human.

Female scientists rarely feature in factual reporting but have more prominence in fictional media.

- The actor who interprets the character for the screen is another important part of the chain of production. One, for example, described how she deliberately avoided making her character adopt feminine gestures and behaviour: 'I didn't want her to go about ... using traditionally feminine modes of persuasion. So therefore there wasn't a lot of smiling, soft gentle looks and understanding chats.'
- Different media outlets, formats or genres offer different challenges and opportunities. For example, TV programmes often have 'ensemble' casts with several key characters. By contrast, Hollywood films are often structured around one 'bankable' star, and focus on exceptional individuals. This means that the key character becomes an isolated representative of 'Women in SET'. An ensemble of female characters (as in, for example, Waking the Dead or CSI) lessens the 'burden of representation' on any single image or individual.

Some of the most appreciated female characters in drama have been based on real senior female scientists.

- The format of a TV series (as opposed to a one-off film or programme) allows for the evolution of storylines over time and the development of complex characterisation. This can destabilise stereotypes by exploring diverse aspects of the protagonists' personal and professional lives.
- Different genres often have deeply rooted themes. For example, Bones is clearly structured around a 'battle of the sexes', with the female forensic anthropologist and the male FBI agent struggling to gain the upper hand. It follows in a tradition of television dramas such as Moonlighting and the same power struggle dynamic (often with a thread of comedy) can be traced back to Hollywood films of the 1940s. The 'battle of the sexes' theme could be welcomed as showing women standing up for themselves. Alternatively, it could be viewed as problematic due to its individualised, and often erotically charged, representation of 'Women in SET'. An ensemble of female characters (as in, for example, Waking the Dead or CSI) lessens the 'burden of representation' on any single image or individual.



- Many women in SET want to see media representations which show strong and 'normal' individuals enjoying their work, overcoming the everyday challenges of their domestic and professional lives, and standing up to sexism where it occurs. Viewers expressed pleasure, for example, in *Silent Witness* because they liked seeing how Sam Ryan 'coped in a male chauvinistic world' or enjoyed 'watching Sam succeed in a man's world, at the top of her tree'. Many viewers value seeing the challenges faced by women more than the simple portrayal of women in senior positions in a taken-for-granted way.
- Trying to create 'positive' representations of women in SET is a complex endeavor. These representations not only interact with economic and genre factors of production, but also depend on what is seen to 'count' as positive. Different scientists have different views on what is positive. For example, opinions vary around the extent to which female scientists might usefully be seen as empathetic and emotionally sensitive, or rational and logical, and the extent to which women's personal lives should be highlighted.
- In addition, the intentions of the producers do not predetermine audience reactions. For example, a female character may be intended to be a positive role model of a woman who refuses to employ 'feminine wiles' to achieve her goals. However, a woman who does not do 'a lot of smiling' and 'soft, gentle looks' is interpreted by some as 'cold-hearted' and 'a bitch'.

When a woman is shown 'without feminine wiles' she can be seen as 'cold-hearted' and a 'bitch'.



Recommendations for the future

- More representation of women in SET and more diverse representations.
- Expand the areas of SET represented (e.g. not just forensic science).
- Represent women in SET across diverse media outlets and genres. Ensure for example, a higher profile for women scientists in documentary series such as *Horizon* as well as in fictional outlets ranging from film to TV drama and drama-documentary.
- Encourage the representation of several different women within individual programmes, rather than as isolated key protagonists. This avoids placing the 'burden of representation' on a single character.

Those seeking to promote positive representations of women could engage with the media in the following ways:

- Be specific about the type of media being discussed and take into account different 'readings' or views of what counts as a positive representation.
- Take into account the economic and social conditions of production and the genre conventions at play when supporting the development of new initiatives.
- Use the opportunities offered by futuristic dramas or science fiction for innovative representations because they can invite audiences to imagine social change. Show how shifts in power relations between women and men came to be achieved.

Futuristic dramas or science fiction offer particular opportunities for innovative representations of women in SET because they can invite audiences to imagine social change.

- Engage with every stage of production (e.g. from commissioners right through to the actors who interpret the part and bring it to life). Ensure access to women scientists who can brief production teams about their experiences to help create diverse and interesting representations. Increase the representation of women in databases. Highlight women scientists (across a range of SET areas) of interest to drama commissioners, writers and researchers – see www.users.globalnet.co.uk/~pawsomni.
- Ideally, maintain on-going links with production teams to take account of the evolution and process of creative work.
- Provide media training for scientists, especially women scientists, to encourage engagement with both traditional 'factual' media and more experimental or fictional genres.
- Develop packs for schools and colleges with a selection of media representations of women in SET including extracts from dramas. This could enable teaching and learning on issues around SET, life-course decisions, work/life balance, and gendered workplace interpersonal dynamics. The pack could also help develop general media literacy skills to help analyse and confront gender stereotypes.

Extracts from dramas could be used to prompt students to debate 'plausible' and 'implausible' (or 'good' and 'bad') aspects.

This series of reports and briefings about women in SET and the media includes:

- Gender, stereotypes and expertise in the press: how newspapers represent male and female scientists (Cardiff)
- Role models in the media: an exploration of the views and experiences of women in science, engineering and technology (Cardiff)
- Screening women in SET: how women in science, engineering and technology are represented in films and on television (Cardiff)
- Promoting women in the media: the role of SET organisations and science media communicators (Cardiff)
- (In)visible Witnesses: young people's views of images of scientists, technologists, engineers and mathematicians on UK children's television from a gender perspective (Open University)

The UKRC aims to increase the visibility of women in SET and work with individuals to raise their profile. As well as the research on the mass media, activities include the creation of case studies of women at all levels in SET, the Play your Part campaign, the GetSET Women database, the Women of Outstanding Achievement Photographic Exhibition, media training, a programme to get more women onto SET public bodies and work with Public Awareness of Science (PAWS).

Further copies of this research briefing, the others in the series, and the full reports are all available from: www.ukrc4setwomen.org

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