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RESEARCH ARTICLE

Perception of S&T Workforce about Defence Coverage in Newspapers: A Gender Specific Perspective

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ABSTRACT

The present study was conducted on the scientific and technological (S&T) workforce employed in various scientific institutions in the capital region of Delhi regarding their perception about coverage of defence-related news items in print media (Newspaper). In all, 438 scientists and technologists from various research laboratories in Delhi were covered through face-to-face interview in 2015 through a structured questionnaire. Due care was taken to cover the S&T workforce across gender, different age groups, education levels and nature of jobs. Gender analysis was carried out on the data collected and it revealed that there are differences in perception of male and female respondents about the coverage of defence-related news by print media. The trends in perception were found to be similar but magnitude differed on different issues. More male respondents were found to be pro-weapons while more female respondents were for civil use of defence research. However, there were issues where gender-bias was negligible and male and female respondents' perception was found to be similar.

KEYWORDS : Defence research, Newspaper, Content analysis, Perception, Gender bias, Science communication.

Introduction

In the present era, scientific & technical developments/ innovations are having ramifications on the economic, strategic,

and social fabric of any nation. This manifests in newer dimensions with regard to new kinds of businesses, skills required for the workforce, weapon systems, and world order. Human quest for better life has emerged as a discipline in itself called science. Science has been successful in explaining the phenomena occurring in nature and has shown promise of further improving the quality of life. Science has shown us the direction regarding optimum usage of natural resources and thereby ensuring their longevity (Rull, 2014). Information is fast becoming the staple diet of the public, as literacy levels are rising. This brings media to the centre stage as the primary provider of such needs. The main aim of the media is to disseminate information, but in the present-day situations it not only serves the purpose of information, education and entertainment but also helps in restructuring, raising consciousness and strengthening the society.

Since the past few decades, scientists and social scientists have directed their efforts to study the relationship between science and media in terms of coverage, perception, attitude, impact, role, demand, etc. Today, science and media associations occupy the center stage in debates at national and international platforms. Research laboratories are keen on sharing their achievements through mass media. When public attitudes to science and technology are being deliberated, the mass media and its role in shaping public perceptions of science and technology and even scientists are seen as quite significant. The media therefore in the actual sense is "a central institution of modern life" and has a public opinion forming function (Antilla, 2005).

Generally, the studies of media coverage of science and public attitudes to new technologies focus on three aspects: the dominant frame, general support for the new technology, and perception of the risks and benefits (Gaskell, *et al*., 2005; Macoubrie, 2006). The media role was quite evident in raising awareness among the public during the aftermath of the plague in India in 1994. The results of the study indicated high levels of consciousness about health, hygiene and plague, especially, with little reference to extra-scientific explanations of the causes of the epidemic (Raza *et al*., 1997). In the current scientific era, science and technology and its developments have become

universal in nature, but science communication activities are restricted to the local or national context. The way new technologies are exemplified in the media, especially newspapers, and how this may affect public opinion on science and technology, are often shaped exclusively by the national context. It has also been argued that "print media in the national context seems to offer a more elaborate and thorough view on many scientific topics than do other media" (Schafer, 2009).

Researchers have also argued that media coverage of science (specific to print medium) is administered and shaped at both macro-level, such as, ownership of media and cultural, and mirco-level factors which includes practices by journalists, its professional values, and organizational arrangements of the media set-up (Hansen, 1994). Researchers have also examined the main characteristics of science journalism, how science journalism is different for various scientific fields and how different definitions of science journalism lead to differing findings. It has been seen science journalism is prompted by scientific events and science coverage in a *broad sense* is defined by a wider range of journalistic styles, driven by non-scientific events, with a focus on the statements of scientific experts (Summ and Volpers, 2016).

India's budgetary allocation for defence is Rs 2,79,305 crore ($43.4 billion) for the financial year 2018-19. This is around 1.5% of GDP and 7.7% more than previous order (Behera, 2018). Defence preparedness is of prime concern for Indian policy makers, given the history of full-fledged wars with neighbours since independence. The coverage of defence by leading national dailies has been found to be dismal, not because it is considered less important by the newspapers, but because of lack of dialogue between the press and defence establishments (Kumar and Kumar, 2016). Defence, and research carried out in its laboratories, is an area of the highest importance and concern to the government and the public as well. Science & technology are inherent ingredients for every kind of research done to develop any defence technology including warfare and associated material. Print medium, especially the newspapers, being the eyes and ears of the public and rulers, have a great role to play in presenting the views and opinions about S&T

development in the country (Kilgour, 2000). It is rightly said that even after the arrival of the electronic media like Television and Internet, the newspaper, in the form of the print medium, has remained an integral part of daily life without any substitute. It has been observed that the newspaper's ability to localise the global happenings is unmatched.

The present survey study on working scientists and technocrats is inspired by the importance of the print medium (newspaper in special context), and the desire to assess what newspapers are writing about defence science & technology and its various aspects viz. the science and technology involved in it, the politics, the challenges faced and the economics. The people involved in science and technology work are best placed to evaluate the defence science & technology related coverage of the newspapers. There is hardly any study available that has dwelled on the coverage of defence science and technology in newspapers as perceived by active scientists. The study is an attempt to explore the unmapped areas of research. There is also a need to evaluate the efficacy of such communications and gauge the opinion of people involved in science & technology work. The defence science and technology, it's political, economic and social aspects need to be examined as they also influence the social discourse and hence get newspaper space[1].

The survey study was conducted on scientists involved in research & development activities and working in research institutions situated in the capital city of Delhi. The respondents were from public sector R&D organizations and have higher educational degrees in science & technology in the related domains. A comprehensive survey questionnaire was developed and administered and data was collected through face-to-face interview. The structured questionnaire contained 35 objective-type questions (including some recorded on Likert scale) and two questions where response was recorded *in verbatim*. In all 438 respondents were covered from different professional qualifications, different age groups and different fields of research.

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[1]Coverage of Defence Science & Technology by Indian Press: A Study of Select English Dailies, Ph.D. Thesis submitted by Phuldeep Kumar, 2017, Maharishi Dayanand University, Rohtak.

Characteristics of the Respondents

Out of the total respondents covered during the survey study, 78.8 percent were male and 21.2 percent female (Figure 1), meaning that the survey provided a true picture of research being conducted in the country, where more males chose the research profession and more females are likely to go in for teaching and academics. Although the study covered all the working age groups (from 21 years to 60+ years), the maximum percentage of respondents were from 31-40 years age group (43.4 percent) followed by the younger age group (21-30 age group) 24.2 percent, 16.7 percent in age group 41-50 years and 13.7 percent in 51-60 years age group (Figure 2). A very small percentage of respondents were above the age of 60 years (2.1 percent). Gender-wise age distribution shows that male and female respondents are almost having similar

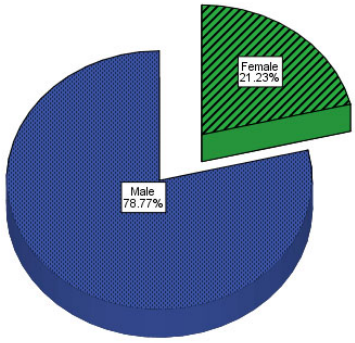

Figure 1: Gender Distribution of Respondents

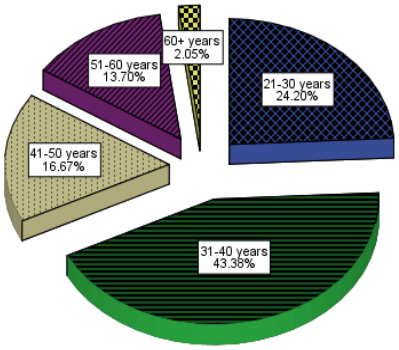

Figure 2: Age Distribution of Respondents

percentage trends across all age groups with the highest percentage at 31-40 years (male 43.5 percent and female 43.0 percent) and no female respondent covered in the survey study was in the age group 'above 60 years'.

As high as 59.1 percent have educational qualification in engineering and 27.4 percent have studied physics or mathematics. Only 5.3 percent are trained in biological science or studied medicine and 8.2 percent were with humanities or management educational qualification. Similar trends for both female and male respondents were observed for educational qualification with difference in magnitude in terms of percentages. Males were slightly higher (60.6 percent) as engineers compared to females (53.8 percent) and biology/medicine as qualification, was higher for females (7.5 percent) compared to male respondents (4.6 percent) (Figure 3).

As far as their nature of job is concerned, 55.5 of the total sampled population was involved in scientific work and 26.5 percent was working as technical support for research. 15.1 percent were involved in academics and 3.0 percent responded that they are involved in other than the above-mentioned works. Male respondents involved in scientific work were higher (57.4 percent) compared to female respondents (48.4 percent); on the other hand females involved in academics were higher (23.7 percent) compared to males (12.8 percent) (Figure 4).

The majority of the respondents (92.5 percent) responded that they were interested in reading or watching defence related news available through media and only 1.8 percent said 'no' to

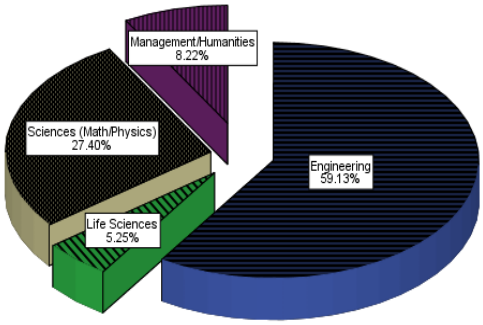

Figure 3: Education Distribution of Respondents

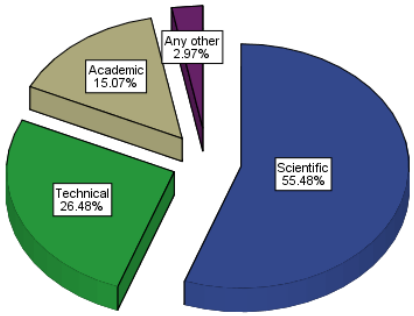

Figure 4: Distribution of Respondents according to their nature of duties

Table 1: Gender-wise distribution of Age, Education and Nature of Duties of respondents

		Male	Female
Age	21-30 years	23.2	28.0
	31-40 years	43.5	43.0
	41-50 years	17.4	14.0
	51-60 years	13.3	15.1
	60+ years	2.6	---
Education	Engineering	60.6	53.8
	Life Science	4.6	7.5
	Sciences (Physics/Maths)	27.2	28.0
	Management/Humanities	7.5	10.8
Nature of Duties	Scientific	57.4	48.4
	Technical	27.0	24.7
	Academic	12.8	23.7
	Any other	2.9	3.2

it. There were respondents (5.3 percent) who responded that they were 'neither interested nor disinterested' in reading or watching defence related news available through media. No female respondent responded that they are 'not' interested in defence related news in media.

Perception of Respondents

Coverage and relevance of news item/s

Perception about reporting of defence related news by the newspaper subscribed by individual respondents reveals that

17.6 percent said the newspaper reports daily about defence research and almost the same percentage (17.4 percent) said 'once in two days'. And the percentages are higher about the respondents who responded 'once in three days' (29.5 percent) or said 'rarely' (34.5 percent). The trends are similar across the gender for the responses with negligible differences in percentages among male (17.1 percent) and females (19.4 percent) responding 'daily' reporting or 'once in three days' (male 30.4 percent and female 25.8 percent).

Scientists were also asked to report the newspaper's attitude towards Indian R&D establishments and the population is almost equally distributed for responses – it 'supports' (33.3 percent), 'criticizes' (32.0 percent) or remains 'neutral' (34.0 percent). Comparatively, the percentage of 'neutral' response was higher among female respondents whereas for both, 'support' and 'criticize', was higher among male respondents. Most of the working scientists perceive that the contents of the news coverage by newspapers is meant for the general public (78.3 percent) and 10.3 percent also responded that it is meant for researchers or scientific personnel and the rest were not able to say anything about the content. More than 64 percent respondents found the presentation of news items in the newspaper 'just informative' and 29.9 percent respondents found the presentation 'interesting'. The percentage of 'just informative' is higher among female and of 'interesting' was higher among male respondents. As far as the relevance of the news item/s is/are concerned, 14.8 percent responded that it is 'very much' relevant, 30.6 percent said that the news item is of 'much' relevance, 42.5 percent said it is 'so-so' and 11.6 percent were of the opinion that it is 'not much'. The percentage of 'very much' relevance was higher among males (16.8 percent) than females (7.5 percent) while 'so-so' response was higher among female respondents (50.5 percent) compared to male (40.3 percent).

Interest and content of the news item

The most interested and preferred news related to defence research is 'Indian defence achievements' (63.9 percent) followed by 'All kinds of defence achievements' (18.9 percent).

Scientists are least interested in the developments of defence R&D in China (2.3 percent) or Pakistan (1.8 percent). Although, female respondents are more interested (69.9 percent) in Indian defence achievements compared to their male counterpart (62.3 percent), but trends among male and female respondents remain the same over all the responses. Research on all kinds of weapons and combat vehicles, bombs, etc. interests most of the scientists (41.8 percent) and also the research in missile development (22.6 percent) and again the conflicts between China (2.3 percent) or with Pakistan (6.2 percent) remain at least priority of interest. Civil use of defence technologies is also of interest to scientists (12.8 percent) with higher percentage among female respondents (18.3 percent) compared to male (11.3 percent).

Post-reading and credibility of the news items

In response to a question 'Do you discuss the defence content with others after reading newspaper?' more percentage of respondents said they discussed the content with others but the frequency differs. 14.2 percent said they 'always' discuss, 29.7 percent discuss it quite 'often', 41.8 'sometimes' discuss it, 11.2 discuss it rarely and 2.3 percent responded that they never discuss it. The pattern across gender remains the same but significant variance is that percentage of male respondents 'often' discuss it with other (31.0 percent) is higher than female (24.7 percent).

And a question was also posed to respondents: 'Do you refer to other sources once you read defence content in newspaper?' In response 9.6 percent responded that they 'always' refer to other sources, 22.4 percent said quite 'often' 37.0 percent said 'sometimes', 22.8 percent refer 'rarely' and 7.5 'never' bother to take it further. Collectively, percentage of male respondents is higher (71.6 percent) than the female respondents (59.2 percent) who refer other sources, 'always', 'often' and 'sometimes' together.

How often to you recall the news items was the other query posed to respondents and in response 12.1 percent recall it 'always', 34.7 percent 'often' recall it, 39.0 percent 'sometimes', 10.7 recall it 'rarely' and 2.5 percent never recall

the news item, the news read in newspaper. Again, the response pattern remains the same over gender but magnitude differs for 'sometimes' (male 38.0 and female 43.0 percent) and 'often' (male 36.2 and female 29.0 percent).

And in response to the question 'Do you write letter to editor after reading the defence item in newspaper?', 90.3 percent female and 80.9 percent male respondents 'never' write any letter to editor. More male respondents collectively write letters to editors in comparison to female respondents. Similar trends are evident about writing articles in the newspaper where 91.4 percent female and 82.6 percent male 'never' write articles in newspaper. Respondents are optimistic about the importance of this sector and think that defence news content also underlines the fact defence is the most important sector for any country. Only 4.3 percent (same for both male and female) of the total respondents said that it 'never' underlines the importance of defence sector. The pattern remains the same for male and female respondents with substantial difference for 'often' response (male 28.7 and female 18.3 percent).

Respondents are also confident and positive about the news items published in newspapers, which add to their knowledge about other fields. Only 1.4 percent responded that it 'never' adds to their knowledge, but at all other levels 'always', 'often' and 'sometimes' it is almost equally distributed with no marked difference between male and female respondents. Only 0.7 percent respondents were of the opinion that the defence content published in newspaper has no clarity and higher percentage of respondents 'often' find the news item with clarity (38.8 percent) or 'sometimes' (30.8 percent) or 'always' with clarity 13.7 percent). Female respondents were higher at 'often' response (46.2 percent) compared to male respondents (36.8 percent). Quite high percentage of respondents (both male and female) said that the defence content published in newspaper is credible. Only 1.4 percent said it is 'never' credible and 7.5 percent said it is rarely credible. The percentage pattern and magnitude of response remained almost same for male and female respondents.

Table 2: Gender-wise response pattern of respondents about post-reading and credibility of defence related news items

	Always	**Often**	**Sometimes**	**Rarely**	**Never**
	Do you discuss the defence content with others after reading the newspaper?				
Female	16.1%	24.7%	45.2%	10.8%	3.2%
Male	13.6%	31.0%	40.9%	11.3%	2.0%
	Do you refer to other sources once you read defence content in newspaper?				
Female	5.4%	22.6%	31.2%	33.3%	7.5%
Male	10.7%	22.3%	38.6%	20.0%	7.5%
	How often you recall the defence related news after reading it in newspaper?				
Female	9.7%	29.0%	43.0%	12.9%	3.2%
Male	12.8%	36.2%	38.0%	10.1%	2.3%
	Do you write letter to the editor after reading any defence item in newspaper?				
Female	2.2%	---	1.1%	5.4%	90.3%
Male	0.9%	1.7%	3.8%	12.2%	80.9%
	Do you write article in newspaper after reading any defence item?				
Female	---	---	1.1%	7.5%	91.4%
Male	1.2%	1.4%	5.8%	8.4%	82.6%
	Do you think defence content published broadly underlines the fact that defence is most important sector for any country?				
Female	28.0%	18.3%	24.7%	23.7%	4.3%
Male	24.6%	28.7%	22.9%	18.0%	4.3%
	Do you think defence content published adds to your knowledge about other fields also?				
Female	26.9%	21.5%	33.3%	16.1%	2.2%
Male	25.2%	30.1%	29.9%	12.8%	1.2%
	Do you find clarity in defence content published in newspapers?				
Female	14.0%	21.5%	33.3%	14.0%	24.7%
Male	13.6%	19.1%	31.9%	18.3%	19.1%
	Do you think defence content published in newspapers is credible?				
Female	19.4%	30.1%	44.1%	6.5%	---
Male	15.7%	33.0%	40.6%	7.8%	1.7%

Advocacy function and preferred medium about the news item

The advocacy trait of respondents was gauged through the question: 'Do you suggest others to read defence content published in newspaper?', and in response 17.1 percent 'always' suggest, 24.0 'often' suggest, 35.6 percent 'sometimes' suggest, 13.9 percent 'rarely' and 8.9 percent 'never' suggest others to read the news item. There is no significant difference among male and female respondents for any response and percentages almost remain the same. Though the survey study was conducted regarding perception of defence news coverage in newspaper but a question was posed to respondents regarding their preference of most relevant medium for getting defence related news items. In this modern age of computerization, the response pattern was evident towards information technology and 53.4 percent preferred 'internet' over 17.1 percent 'newspaper' as the preferred medium. Television (11.4 percent), Journals (10.5 percent) and Magazines (5.7 percent) were other major preferred media for such news items. Though 'internet' is more preferred by females (64.5 percent) than males (50.4 percent) whereas percentage of 'newspaper' among males is slightly higher (17.7 percent) than the female respondents (15.1 percent).

Media and general public

More than 50 percent of the scientists do not pay attention to the names of journalists who write or cover the defence related news item but 30.8 percent do pay attention to these names. Analysis (28.8 percent), Article (26.7 percent) and News Report (25.6 percent) are the preferred format for defence content in the newspaper. Analysis is more preferred by male respondents whereas articles and news reports are preferred by female respondents. Editorial (10.3 percent) and interviews (3.4 percent) are less preferred format for defence content.

Quite a lot of respondents (56.8 percent) think that general people do have interest in defence related news while 22.4 percent were confident that general people do not have any interest and 19.9 percent responded 'can't say'. The percentage even increased (76.9 percent) for the question 'Do you think that one should read defence content in daily newspaper?' and only 6.2 responded 'no' to it. Female respondents are slightly higher

in percentage (78.5 percent) who thought that general people should also read these news items compared to male respondents (76.5 percent).

Discussion

Studies at Kings College, London on young people's science aspirations and career revealed that gender specific choices are evident from a very young age. The study concluded that career in science is somewhat a high priority for boys in comparison to girls, although more girls in terms of percentage have rated science as their favourite subject in comparison to boys (ASPIRES, 2013). Boys from the United Kingdom had more positive attitudes to science and greater levels of participation in scientific extra-curricular activities compared to girls. A positive attitude to science was strongly positively related to having parental support for science, family background and having scientific peers. (Breakwell and Beardsell, 1992). Perception about coverage of defence research in newspaper is no exception, though the intensity differs from issue to issue. Contribution of many socio-economic factors, psychological factors, biological factors and upbringing of individuals in Indian society, lead to construct the perception and response behaviour on the basis of gender and hence differences are evident.

Studies have also shown that there is division of the sciences among children: physics and mathematics are treated as male subjects and life sciences more popular among female students (Marsh, 1998). It has also been concluded that boys, in the United Kingdom, have a strong curiosity to learn about physical science compared to girls who are more interested in human biology. Boys had much greater experience than girls of performing trivial activities and girls had more experience of biological science activities (Smail and Kelly, 1984). Further probe was made on 11-year-old secondary school students on cognitive tests, in the United Kingdom. Girls and boys were found to be approximately equal in science knowledge. Boys did slightly better in tests of physical science. Boys performed distinctly better than girls in tests of spatial ability and mechanical reasoning (Smail and Kelly, 2006).

Gender difference in perception and use of learning website 'www.Whyville.ne' was conducted by Aschbacher (2003) in US and found that design opportunities on the site were very interesting to girls and present another avenue for engaging girls in science. Findings from a study on eight to eleven-year-old students' attitudes and perceptions of primary science in Ireland and UK revealed that younger children had more positive science attitudes than children in the more senior classes and girls had slightly more positive attitudes towards school science than boys (Murphy and Beggs, 2001). Zilionis (2008) studied gender differences in perception about internet and found that females consider internet technology as a tool to share ideas while males perceive internet as a kind of weapon and source of power. Further, it was observed that females are having anxiety towards use of computer compared to males and Internet perception and use are influenced by psychological aspects and distinctions in socioeconomic situations.

The analysis also revealed that male respondents are more critical in perception about coverage of defence related news by the newspaper they read. Percentage of male respondents who either 'support' or 'criticise' was higher than female respondents while more female respondents were inclined to remain 'neutral'. More female respondents want to provide safer insight about the defence-related coverage in print media. Similarly, when asked about their perception about the general public's interest in defence-related research comparatively more female respondents provided 'can't say' response instead of supporting or negating the question. Even for perception about relevance of defence news items to the general public more female respondents said 'so-so' but male respondents were more for higher relevance of these news items. Female respondents were also more than their male counterparts in civil use of defence technologies. The results also reveal that male scientists show more analytical and more concern about defence research and do refer to other sources once they read the news item in newspaper. The other important aspect is writing articles for print media, where more males than females write articles for the newspaper.

The response behaviour is more according to the upbringing of males and females in Indian society, where females are

motivated to take safer positions compared to male respondents, even though they are working with scientific institutions with fellow male scientists and technologists in a similar milieu.

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