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**The research methods of German
science journalists**

Findings of a representative survey¹

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This study is based on a representative survey carried out by a standardised written questioning of male and female science journalists throughout Germany. The respondents were drawn from address catalogues coordinated with address compilations of the science journalism section of the Free University of Berlin. Regarded as "elements" of the basic stock and thus as "science journalists" were all those with staff contracts and mainly occupied freelancers reporting predominantly or partially in local and supraregional daily newspapers, weekly and Sunday newspapers, general readership publications, news agencies, public broadcasters and commercial broadcasters on scientific themes in the following categories: natural sciences, technology, astronomy and space exploration, medicine (including psychology and pharmacy), nature and biology, humanities and social sciences, ecology and environmental protection, research and tertiary education policy.

The sample comprised 350 persons and was compiled by stratified random sampling. The survey period encompassed the six weeks from 22 February to 31 March 1995 and included a second reminder letter again containing the questionnaire. This yielded 199 questionnaires to work with. After the sample had been cleared of flawed addresses and persons who, for example, no longer worked as science journalists, were retired or ill, the return rate was 64% which can be regarded as very satisfactory for written questionings.

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Science journalists in Germany

By the definition applied, 1,699 science journalists were identified in German media. This amounts to some 3% of the total number of 54,531 journalists. The following table shows the distribution of science journalists among the various media:

Table 1: Distribution of science journalists among media categories

Media types	Absolute numbers (N=1,699)	Percentage
Daily newspapers	439	25.8
Weekly newspapers	36	2.1
General readership periodicals and illustrated magazines	219	12.9
Agencies	30	1.8
Public broadcasters	199	11.7
Commercial broadcasters	6	0.4
Freelances	770	45.3

The journalists questioned could be categorised as "specialists" (classical science journalists) and "all-rounders" working less specialised. Factors used to form the groups - allrounders versus specialists - are: a) proportion of scientific themes in their own reporting, b) membership of a special science reporting unit and c) placement of scientific items on special pages or in special science broadcasting slots. By this definition 48% are allrounders, 52% specialists.

About a third, 33.7%, of the science journalists work as freelances, 66.3% hold staff positions. The proportion of freelances roughly matches the proportion of about 30% found in a general journalism survey.

Our study found a higher proportion of women (40%) among science journalists, which we cannot fully explain.

The "products" of the science journalists

Less than 50% of the work of 42% of the journalists deals with science while more than 50% of their work concerns science for 58% of them. Closer scrutiny reveals that more than three quarters of the output of 45% of the journalists is scientific.

In terms of total output it was found in respect of the print journalists, the largest group among science journalists, that just under half of them write up to 270 words (45 lines á 6 words), 32% up to 540 words (90 lines) and 22% more than 540 words daily.

Focal themes most frequently dealt with: medicine (19.3%), ecology (15.9%), natural sciences (15%), nature and biology (13.6%), technology (11.6%), social sciences (7.5%), research and tertiary education policy (6.5%), astronomy and space exploration (6.4%), humanities (4.3%).

Career paths

The proportion of tertiary graduate journalists in our sample is a very high 84%. Of these, 12% did not complete their studies, 42% graduated with diplomas, 25% with doctorates, 11% with state examinations and 8% as Masters of Science or Masters of Art.

Analysis of the fields of study as a whole yields a quite balanced relationship between natural sciences and humanities (28% versus 29%). But the question as to the major subject area shifts the balance in favour of natural sciences (37%), with only 25% of the science journalists having chosen humanities as their main study emphasis.

Around a third of the science journalists worked at an institution of higher learning before working journalistically. Journalistic training in form of an internship ("Volontariat") was completed by 58%, almost identical with the 60% of journalists in general.

Perception of the profession

Ninety five percent agree with the notion that one of the main functions of reporting science is to convey facts. To the science journalists entertainment and criticism are less important functions. In regard to questioning scientists with differing views on a particular issue, 40% of the science journalists claim to do this "very often", 44% "occasionally", 16% "rarely" or "very rarely".

Only 14% want scientific topics to be placed *only* on special pages or in special broadcasting slots, 68% prefer mixed placement in special and general outlets.

In line with the inclusion of science journalists who do not necessarily conform to the classical "professional profile", only 57.3% would define themselves as "science journalists". In response to the open supplementary question as to what they would call themselves instead, 5% give definitions very close to the definition of "science journalist" used in our study, such as "specialised journalist for economics, social matters and the environment", "advice-giving journalist in scientific matters", "science and general journalist". Twenty six percent give definitions outside the framework, such as "news journalist", "allround journalist", "culture journalist", "economics journalist".

How the science journalists perceive scientists

Most of the studies exploring the relationship between scientists and journalists approach it from the scientists' perceptions of the work of the journalists. The perceptions are predominantly negative. Scientists judge journalists by the criteria of the scientific community which are centred on objective correctness and less on making findings more broadly known.

The assessment of "the other side" appears to be more positive, with 72% of the journalists questioned describing contact as "mainly good". But there is also criticism. The main point, made by 78%, is that the things scientists say are incomprehensible; followed by the demand of scientists to vet manuscripts before publication (68%). The observation, that scientists are not able to break out of a purely scientific way of seeing things,

takes third place (65%), followed by the experience of scientists not wanting to accede to journalistic requests (e.g. length of a statement) (60%). It appears that scientists have recognised their duty to inform because only 15% of the journalists reported a fundamental refusal by scientists to provide information requested. Some other experiences in dealing with scientists, reported by the journalists under "Other observations", follow: *"too far removed from life"*, *"fear of publication of unpublished findings"*, *"exaggerated perception of their own achievement"*, *"great shyness to be in the press spotlight or to arouse unjustified hopes of healing if a therapy is still in the experimental stage"*, *"fear of colleagues in the same field"*.

A comparison between allrounders and specialists in their general contacts to scientists reveals that 82% of the specialists but only 63% of the allrounders describe this contact as "predominantly good". Moreover, the specialists (73%) have contact with scientists more frequently than the allrounders (42%).

Freelance science journalists

In defining the basic stock for this study it was attempted to include only freelances who can be assumed to earn most of their income, i.e. at least 50%, with their journalistic work. This did not quite succeed. However, just under a third (29%) of the freelance science journalists report that they earn less than half of their income from journalistic work. This group was considered separately in the further evaluation.

The following table shows the media organisations regularly using the services of freelances:

Table 2: Distribution of freelances among media

	Medium	Employed "very frequently" to "occasionally" (n=67)
1	Specialised journal	65.7%
2	Supraregional newspaper	52.2%
3	General readership periodical	44.8%
4	Weekly newspaper	31.3%
5	Public radio	28.4%
6	Local newspaper	22.4%
7	Agency	20.9%
8	Public television	20.9%
9	Commercial television	6.0%
10	Commercial radio	3.0%*

* Because multiple answers were possible the sum of percentages is more than 100.

It is shown that work for specialised journals tops the media outlets. This finding is not, however, to be taken to mean that the majority of "freelances" among those we questioned work mainly or exclusively for specialised journals. On the contrary, the figures suggest that there is hardly a freelance science journalist who does not *also* write for a specialised journal, which is not surprising given the ever expanding specialist journal market and the limited work opportunities for "freelances". Related to supraordinate media areas, freelances work most frequently for print media (73%), followed by radio (11%), television (9%) and agencies (7%).

The major part (60%) of the coverage by freelance science journalists appears on specialised pages or in specialised science broadcasting slots.

Staff science journalists

Similarly to the freelance science journalists, most of the staff science journalists also work for print media:

39% for local newspapers,

23% for general publications,

9% for public television,

8% for public radio,

8% for weekly newspapers,

6% for agencies,

5% for supraregional newspapers,

less than 2% for both specialised journals or commercial television or radio. Only 43% of all staff science journalists are attached to a special science unit. In second place comes assignment to "Special Pages/Weekly Supplements" sections (12%) and in third place to the "Political Unit" (9%).

Our study finds that only just under a third of the science journalists work for a medium which has exclusively special pages or broadcasting slots for science. More than 60% of the staff indicate that science is published happens in both different sections and specialised slots. Eight percent of the respondents work for a medium that has not set aside any special pages or slots for science.

It emerged that the special places for scientific themes often comprise only a page a week. A vast majority (86.5%) of the special pages or broadcasts appear no more frequently than once a week.

Time devoted to journalistic activities

The "classic" activities of journalism, "research, selection, writing", also determine the professional normalcy of science journalists in Germany. On average they spend most of their time writing - about one and three quarter hours a day. An hour and a half is spent on research and just over an hour on editing texts.

Table 3: Average times spent on journalistic activities

Activity	Minutes per day / Averages (n=183)
1. Writing	107.4
2. Research	91.3
3. Editing	72
4. Outside appointments	61.1
5. Reading mail	56.6
6. Conferences	33.1
7. Organisation	31.3
8. Layout	25.5
9. Production	17.6
10. Moderation	4.2

These averages allow no statement to be made, however, about how the "activity profiles" of the journalists working as staff or freelances with various media differ. A separate analysis by media areas is given by Table 4.

Table 4: Average times spent on journalistic activities, differentiated by media

Activity in minutes per day	Local paper (n=46)	Supranat. & weekly paper (n=16)	General publication (n=30)	Agency (n=7)	Public b'casting (n=20)	Free-lances (n=61)	Total (n=183)
Reading mail	51.4	54	57.5	57.1	50.5	63.4	56.6
Conferences	41.8	39	48.3	13.5	34	20.1	33.1
Appointments	63.5	43.7	55.6	45.7	50.7	74.2	61.1
Research	71.3	125	106.1	64.2	75	100.9	91.3
Editing	116.7	94.3	91	152.8	58.5	15	72
Writing	78.9	92.5	97.3	98.5	71.2	152.5	107.4
Layout/Product.	56.8	51.2	17.6	33.5	62.5	33.5	43.1
Organisation	26.6	30.6	33.8	23.5	58.5	26	31.3
Moderation	0	0	0	0	23.7	3.3	4.2

The science journalists working for supraregional newspapers and weekly newspapers research about half an hour a day more (125 minutes) than the average for their colleagues (91 minutes). The science journalists with the agencies top the list for editing (152 minutes). Journalists with local newspapers also invest above the average (116 minutes) in editing. Freelance science journalists emerge as the ones with the greatest output. They write for an average of two and a half hours a day.

The information and idea sources of the science journalists

Table 5: Information sources for science reporting

	Information sources	Averages* (n=196)
1.	Specialist publication	2.12
2.	Scientists	2.34
3.	On location	2.41
4.	Personal archives	2.68
5.	Specialist congresses	3.08
6.	Agencies	3.12
7.	Press conferences	3.19
8.	Other media	3.22
9.	University press releases	3.24
10.	Authorities	3.34
11.	Employer's archives	3.41
12.	Business press releases	3.98
13.	Archives of publishers	4.32
14.	Local databanks	4.65

15.	Delocal databanks	4.74
16.	Other	5.87

*1=very frequent, 6=never

In the first third of the priorities list are found, in addition to the sources more strongly involving the journalist's own initiative (research on location, personal archives), above all the in-science sources. The middle section of the list is dominated by the typical sources for journalists such as agency material, press conferences and press releases. A more or less marginal role in acquiring information is played by the archive materials of big publishers and the local and delocal data banks. This is probably due mainly to the fact that these sources are not equally available to all science journalists. The comparison of information and idea sources results in a quite similar listing, with the difference that journalists' own initiative tops the list with "own idea" and the last third reflects the low importance of interpersonal communication - with exception of the scientists - in finding ideas (ideas from free authors, one's own newsroom, readers).

The important role scientists play in both finding ideas (third priority) and in acquiring information (second priority) corresponds to the responses to the question as to how often journalists make contact with scientists: 60% do so "frequently", it happens "occasionally" for 27% and only 12% "rarely" seek contact with scientists. Most science journalists make contact with scientists they already know ("already know him/her"), at press conferences and through references in publications. Contact making through expert intermediaries is named as the last of seven listed possibilities.

Research resources available to science journalists

The kind of journalistic research depends not only on self-initiative but also on the supports provided to the journalists by their employers or clients. Our survey found that just under four fifths of the staff and freelance science journalists have access to the archives of the organisations employing them. Specialised journals subscribed to can be used by 65% of the respondents, international telephone calls are made by 64%, travel expenses or other additional expenses are reimbursed to just under 60% of the science journalists. On the other hand, access to local and delocal data banks or Internet installations is less widespread. Local data banks are available to 16% of the journalists, 12% can access Internet and delocal data banks. Of the 199 responding science journalists 16 (8%) are provided with no supports by their employers; 14 of these are freelances.

New research methods used by science journalists

Science journalists are having to absorb, select and process ever more information so that means to cope with this flood have to be sought. In this context two possibilities must be given priority: improving research by electronic communication systems and improving communication between journalists and scientists through the "interface function" of so-called expert brokerage. These expert finders not only set up selective contacts between journalists and scientists but also provide both information briefs and background on scientific themes.

Our survey found that science journalists as yet rarely use these two research methods, although more journalists know of the various systems offered than use them.

Table 6: Use and knowledge of communication systems

Communication or information system	"Don't know it"	"Heard of it"	"Would like to use it"	"Have used it"
Internet (e-mail) (n=193)	15.5%	36.8%	30.1%	17.6%
BTX* (n=182)	2.7%	56%	13.2%	28%
World Wide Web (n=184)	45.1%	31.5%	17.9%	5.4%

*Renamed Datex J, respectively T-Online.

BTX is the most used and best known communication system, probably because it has been in operation since the early 80s. "World Wide Web" (WWW) has operated only since 1992 and so is the least known. Use of Internet and WWW is not as widespread as that of BTX. However, the interest ("would like to use") in these two relatively new and internationally networked communication systems is comparatively greater than in BTX, introduced 15 years ago and initially available only in Germany. Although none of the communication systems has been used by more than 28% of the science journalists, if one asks the fundamental question whether they have ever used one of the new communication offers, 35% say they have.

Compared with the new communication systems, there is even less use of intermediaries to find experts.

Table 7: Use and knowledge of expert finders

Expert finder	"Don't know it"	"Heard of it"	"Would like to use it"	"Used it"
Media Resource Service (MRS) (n=187)	61.5%	22.5%	10.2%	5.9%
Information Umwelt (IU)* (n=188)	55.3%	23.9%	10.6%	10.1%
SIPI** (n=184)	67.4%	20.1%	10.3%	2.2%
AWMF*** (n=191)	55.5%	23.6%	8.9%	12%
Experten-Makler**** (n=181)	78.5%	8.8%	9.9%	2.8%

* Information Service on environmental matters, Munich

**Scientists' Institute for Public Information, New York

*** Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften, Düsseldorf (Information Service of German medical associations)

**** Expert brokerage by e-mail

Two observations are of special interest in this context: 1. All the expert finders listed are not known to far more than half of the science journalists. 2. The finders based in Germany are used most frequently, namely the Arbeitsgemeinschaft der Wissenschaftlichen Medizinischen Fachgesellschaften (medical) in Düsseldorf and the Information Umwelt (environmental) of the Forschungszentrum für Umwelt und Gesundheit (GSF, Research Centre for the Environment and Health) in Munich. An exception is the "Experten-Makler per e-mail" (Expert Brokerage by e-mail) based in Clausthal-Zellerfeld, probably because this intermediary went into operation only at the start of 1995. The intermediaries operating from London (MRS) and New York (SIPI) are hardly used at all even though both offer service to journalists outside the base countries. Some 10% of the science journalists indicate that they would "like to use" all the intermediary services, regardless of how well they are known, which would tend to suggest a rather unspecific interest. The overview shows that 21% of science journalists have used at least one of the five expert finding services once in their researches.

There are no significant differences between allround or specialist, staff or freelance journalists in the use of expert finders. Although both the specialists (28%) and the freelances (30%) have used this resource more often than the allrounders (16%), respectively staff (18%), both differences are only minimally relevant. However, the more frequent use of expert brokering by freelances could indicate their trying to offset their disadvantages vis a vis staff in regard to research aids. Such differences cannot be identified in the use of communication systems; here another context is more interesting: those who have used one of the communication systems have also made more use of expert brokering.

Two practical conclusions could be drawn from this observation: 1. The more pessimistic one is that the well informed, professionally researching journalists form an inner circle and that it is very difficult to improve research potential for the great majority of science journalists. 2. The more optimistic one is that over the longer term an increasing number of services on offer can improve the research of a larger group of journalists.

To arrive at more "hands-on" conclusions, the survey asked what criteria play a part in using expert finders.

Although it was shown in the use and knowledge of expert brokering that services based in Germany are used more often than others based abroad, the criterion of a German location was given the least importance in response to the question about marginal conditions for use; about 30% call this criterion "important" or "very important". "Information in the German language" is "very important" or "important" to 40% of the journalists, which could be part of the explanation for German expert brokerage being used most. The fact that the service is offered free is also "important" or "very important" to 40% of the responding science journalists.

The three most important criteria named for using expert brokering were speed (80%), balance of experts and counter-experts (c. 75%) and independence from political parties and business and industry (around 70%).

The contradiction between practical use and theoretical expectations made plain by the location criterion shows the direction further exploration of science journalists' research methods should take. The theoretical

examination of "what could be" must go hand in hand with empirical testing of "what actually is" so as not to aim the research past what science journalists actually do or may want to do.