



Office of Science  
and Technology



# Science and the Public

## A Review of Science Communication and Public Attitudes to Science in Britain

# Foreword

The Office of Science and Technology and the Wellcome Trust have jointly sponsored this research to help science communicators think about the information needs of their audiences. It is important that the public debate on science issues is inclusive, and that no member of the public feels disenfranchised. We hope that this report will stimulate communicators to develop new ideas to interest both existing audiences and to reach out to those who have not yet become engaged in the issues that modern science raises for all of us.

The report also provides a benchmark against which we can measure change in attitudes to science over time.

Publication of this report, together with the House of Lords' *Science and Society* report<sup>1</sup> published earlier this year, and the Government's White Paper, 'Excellence and Opportunity'<sup>2</sup> begins a period of consultation. Over the next few months, we hope that scientists and science communicators will consider what role they can play in informing the debate about those aspects of science which are of concern to the public, as well as contributing to a wider debate about the development of science communication policy and practice at the national level.

Most of us agree that the 'deficit' model of the public understanding of science is less relevant today. This report is intended to start the process of discussion that will take us forward into the 'engagement' model of *Science and Society*. We look forward to a stimulating debate.

Lord Sainsbury  
Minister for Science

Dr Mike Dexter  
Director, The Wellcome Trust

# Science and the Public

## A Review of Science Communication and Public Attitudes to Science in Britain

A Joint Report by  
the Office of Science and Technology  
and the Wellcome Trust

October 2000

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# Acknowledgements

We are indebted to the members of the public who took part in this research. We would like to thank the researchers at Research International, Counterpoint Research and Taylor Nelson Sofres Harris for their work on the project, and Professors John Durant and Alan Irwin for reading and commenting on the report.

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# Executive Summary

This report is based on research sponsored by the Office of Science and Technology (OST) and the Wellcome Trust. It brings together research that maps the provision of science communication and research exploring public attitudes to science, engineering and technology. This report is intended to start a consultation process amongst the science communication community regarding priorities for future activity.

## Issues in science communication – policy and practice

At present, the main issue in science communication policy is how best to develop a dialogue between scientists, policy makers and the public, and to bring public opinion into the development of policy. This research is designed to inform those concerned with the development of policy and practice in science communication.

Both the Government and the Wellcome Trust wish to engage as wide a proportion of the general public as possible. In all activities, this means understanding the wide range of views held by the public and the variety of ways that they could be engaged in dialogue. Otherwise, there is a danger that only the views of the scientifically assured will be heard.

## Research method

The research comprised two studies:

- a survey of the various ways in which the facts, issues and policies involved in science and medicine are brought to the attention of the public;
- a survey ( $n=1839$ ) of attitudes of the general public towards science together with their life and leisure interests was conducted following initial scoping group discussions. Information gathered as a result of the group discussions informed the questionnaire developed for the attitude survey. Results were analysed using the statistical techniques of factor and cluster analysis. This facilitated the identification of six attitudinal clusters among the population, which were utilized in the writing of the report.

## Science communication provision

Science is communicated to the public in many different ways; however, there is a skew towards more activities that provide facts about science compared with activities that highlight the ethical and policy issues raised by science.

With limited funds at their disposal, many science communicators accept that better coordination between themselves would help to maximize impact, but the study highlighted a reluctance to give up autonomy and submit to a broader, more strategic and coordinated approach. This reluctance is due in part to the conflicting objectives of different organizations (and individuals), and a tendency for activities to be 'provider driven' rather than 'consumer driven'. By trying to improve understanding of the public's attitudes and interests, this research seeks to provide pointers as to how the wider public can be engaged in an ongoing informed debate about science. Concentrating on the differences in the potential audiences as ascertained by the research will allow science communicators to understand better what is the best way of involving different people in the debate.

## Public attitudes to science

This survey found that three-quarters of the British population are 'amazed' by the achievements of science. Largely this is because they can see the benefits for themselves – two-thirds agree that science and technology are making our lives healthier, easier and more comfortable. Only a fifth claim that they are not interested in science and do not see why they should be, and a partially overlapping fifth agree that the achievements of science are overrated.

Eight out of ten people agree that Britain needs to develop science and technology in order to enhance its international competitiveness. The need to invest in basic research is also appreciated: 72 per cent agree that, even if it brings no immediate benefits, scientific research that advances knowledge is necessary and should be supported by the Government.

Concerns were raised over the use of science and the ability of society to control science. When asked whether they thought the benefits of science are greater than any harmful effects, the response was ambivalent: 43 per cent agreed, 17 per cent disagreed, and a third preferred to give no opinion.

There is a similar degree of ambivalence about politicians' motives for supporting science. Just under half of the sample (43 per cent) agreed that politicians support science for the good of the country, nearly a quarter expressed no opinion and a quarter disagreed.

There is concern about Government's ability to control science. Only three out of ten disagree that the speed of development in science and technology means that it cannot be controlled properly by Government, while four out of ten agree, revealing some degree of ambivalence. Moreover, half (53 per cent) think that politicians are swayed by the media and that they should take more of a lead.

There is also concern about what might go on 'behind closed doors' in research institutions. Over two-thirds agree that rules will not stop researchers doing what they want behind closed doors and over half think that scientists seem to be trying new things without stopping to think about the risks. Despite this concern, only 36 per cent agree that science is getting out of control and there is nothing we can do to stop it.

## Attitudinal groups

In general, scientists are respected: 84 per cent of people think that scientists and engineers make a valuable contribution to society, and three-quarters think that science and engineering are good careers, and that science, engineering and technology will provide more opportunities for the next generation. While two-thirds of people think that scientists want to make life better for the average person, a similar proportion agree that scientists should listen more to what ordinary people think.

A key finding of this work has been the identification of attitudinal groups within Britain. Using factor and cluster analysis of the responses to 40 attitude statements, the quantitative research identified six groups.

### **Confident Believers**

Positive, self-confident and outward looking, the Confident Believers (17 per cent of the sample) tend to be interested in science because of the benefits it brings, and their interest in politics means that they tend to have faith in the regulatory system and believe that they can influence Government. They tend to be well off, well educated, middle aged, and more likely to live in the south of Britain.

### **Technophiles**

One-fifth of the total, this, the largest group, is confident, pro-science and well educated in science, but sceptical of politicians. They tend to be confident that they know how to get information when they need to, although they need reassuring that the regulatory system exists and works effectively.

### **Supporters**

Some 17 per cent of the total, this relatively young group tends to be 'amazed' by science, engineering and technology and feels self-confident enough to cope with rapid change. They also tend to believe that the Government has got things under control. Although they, like everyone else, express most interest in the medical sciences, they tend to be slightly more interested in the physical sciences – especially engineering – than others.



## Conclusions

### Concerned

The Concerned is the smallest (13 per cent of the total) and most female (60 per cent) of the clusters. The Concerned have a realistic and positive attitude to life but are sceptical of those in authority. Their social grade, household income and education levels tend to mirror the population as a whole, but they tend to be rather home centred. They are interested in a whole range of topical issues, and they know that science is an important part of life, especially for their children.

### Not Sure

This group (17 per cent of the total) tends to have the lowest household incomes, the lowest level of education, and falls into social grades D and E (semi- and unskilled manual workers, and those wholly dependent on state benefits). Their views tend to be unformed: they are neither 'anti-science' nor 'pro-science'. This is largely because the benefits of science are not always apparent in their daily lives, which are constrained by low income and educational achievement.

### Not for Me

This group, 15 per cent of the total, mainly comprises those aged 65 and over, of social grade E women, and of slightly younger men of social grade C2 (skilled manual workers). Like the Not Sure group, they are not particularly interested in political and topical issues nor in science. However, their lack of interest in science does not stop them appreciating its benefits for the future and its importance to young people.

At the national level, there is lack of a framework within which people can access information about new science, assess and judge the information and its implications.

The respondents in this study were unsure of how this might happen and it remains a challenge to science communicators and others.

The study of public attitudes to science has identified six attitudinal clusters. Certain activities designed to communicate science are more suited to some clusters than others. By coordinating activities, organizations with different perspectives and objectives can begin to address certain clusters with different provisions for science communication, providing a framework for a national debate. This implies a certain degree of coordination and collaboration between organizations.

Science and the Public  
A Review of Science  
Communication and Public  
Attitudes to Science in Britain

# Introduction

## 1.1

This report draws together the results from two major pieces of research – an overview of science communication activities in Britain today, and a detailed understanding of public attitudes to science. By combining the information from both studies, this report aims to inform future science communication strategies for both policy and practice.

### 1.2

The research reported here sets a baseline for public attitudes to science, engineering and technology. The survey has been designed to be repeated at regular intervals to monitor any changes in these attitudes. By identifying a number of factors, which together comprise an individual's attitude to science (see Chapter 5.03), six distinct attitudinal groups with differing socioeconomic profiles have been identified. These results provide a resource for all those active in science, engineering and technology communication who wish to develop their own programmes further.

## Background

### 1.3

At the launch of Science Week in 1999, Lord Sainsbury announced that the Office of Science and Technology (OST) would be reviewing activity in the public understanding of science, engineering and technology in order to target resources more effectively. The Wellcome Trust's Medicine in Society Programme had independently commenced some relevant pieces of strategic research to inform its own programme. The OST and the Trust agreed to collaborate, ensuring that all relevant pieces of work were pulled into a coherent whole.

### 1.4

The Wellcome Trust and the OST believe that an 'engagement model' of science communication – a two-way dialogue between specialists and nonspecialists – is more appropriate than the 'deficit model', which just gives people more information about science. This aim is embodied in the objectives of the Medicine in Society Programme at the Wellcome Trust and the Public Understanding of Science, Engineering and Technology Programme at the OST.

### 1.5

The objectives of the Medicine in Society Programme are:

- to stimulate and inform debate about the social and ethical issues arising from current biomedical developments; and
- to make information about biomedical science and its achievements and applications more widely accessible.

The OST's objectives are to increase public understanding and awareness of:

- scientific facts and more importantly, scientific and engineering processes;
- the role played by science, engineering and technology in everyday life;
- the benefits brought by science, engineering and technology and an appreciation that these benefits are not without potential drawbacks.

### 1.6

Both organizations aim to promote informed debate, and a better appreciation of the role of science in society and, crucially, both its potential benefits and its limitations.

## Objectives

### 1.7

To help inform the policy and practice of science communication, the research described in this report was designed to:

- identify the components or elements of people's attitudes to science;
- identify different attitudinal groups with respect to attitudes to science;
- determine whether attitudes vary depending upon the science under discussion; and
- map existing science communication activities based in the UK.

## Scope of review

### 1.8

For the purposes of this programme of research, 'science communication' was defined widely and the term was used in preference to 'public understanding of science'. Science communication therefore encompasses:

- print and broadcast media activities;
- traditional museums;
- Government and voluntary sector public understanding of science programmes;
- existing and new science centres;
- efforts of private industry; and
- the scientific community's activities more widely.

### 1.9

Thus it attempts to include any and all activities that intend to educate or engage people in science, engineering and technology.

The relationship between science, engineering and technology as perceived by the public was also explored.

### 1.10

The study did not look at the attitudes to science of those aged under 16, nor did it venture into the formal provision of science education. These topics warrant separate, in-depth studies. The study did include science communication aimed at those aged under 16 and provided outside of the school curriculum.

## Research methods

### 1.11

Two research projects were undertaken by external consultants after competitive tenders:

- research mapping of current science, engineering and technology communication provision in the UK ('supply-side research'). This research was commissioned by the Wellcome Trust and conducted in August 1999 by Research International;<sup>3</sup>
- research into public attitudes to science, engineering and technology ('demand-side research') in Britain. The qualitative research was conducted by Counterpoint Research and the quantitative survey by Taylor Nelson Sofres Harris.<sup>4,5</sup>

Other research has allowed some limited comparison of the British position with that of our international competitors

## Structure of report

### 1.12

Chapter 2 discusses the current key issues in science communication policy and practice. Chapter 3 sets out the results of the research into science communication provision in the UK. Chapter 4 gives an overview of the British public's attitudes to science, engineering and technology and, as far as possible, compares the results with attitudes elsewhere in the world. Chapter 5 describes the attitudinal groups (or clusters) within the British population, and the implications for science communication. Chapter 6 offers some conclusions and recommendations for the future provision of science communication. Appendix 1 contains a subset of tables referred to in this report; the full set is available from the OST. Appendix 2 contains the topic guide developed by Counterpoint Research, who undertook the qualitative research. Appendix 3 is the questionnaire and Appendix 4 the sampling and analytical techniques used by Taylor Nelson Sofres Harris Research in the quantitative survey.

# Issues in Science Communication – Policy and Practice

## 2.1

This report is concerned with the communication of science to the nonspecialist public, whether via the media, the scientific community, the Government or industry, and is based on research among the public and science communicators from all sectors. This chapter briefly outlines some current issues in science communication in Britain.

## What is science communication?

### 2.2

The term 'science communication' encompasses communication between:

- groups within the scientific community, including those in academia and industry;
- the scientific community and the media;
- the scientific community and the public;
- the scientific community and the Government, or others in positions of power and/or authority;
- the scientific community and the Government, or others who influence policy;
- industry and the public;
- the media (including museums and science centres) and the public; and
- the Government and the public.

## Current issues

### 2.3

There are tensions within and between these players about what, why and how they are communicating with the public; some of these tensions are explored briefly below. A desire to communicate definite 'facts' about science can conflict with the need to communicate how the scientific process works. The former aims to provide relatively clear-cut scientific information, while the latter tries to give the public an insight into the continually questioning method of scientific discovery. Greater understanding of the scientific process is important if nonscientists are to appreciate how accepted theories can be overturned and new interpretations or results take precedence. This should prevent science and scientists being dismissed as confused or confusing when new findings are announced.

### 2.4

Despite a general agreement among science communicators that the top-down model of 'teaching people science' (known as the deficit model) is inappropriate, there are still many communicators who operate in this mode. While it may be appropriate for communicating information to 'Supporters' (an attitudinal cluster described in Chapter 5), it is unlikely to draw a wider range of people into debates about current science policy issues.

**2.5**

There are those, including the OST and the Wellcome Trust, who are seeking to be more inclusive in their science communication, engaging more people in science-related issues. The Trust believes that some scientific developments are so fundamental that there needs to be a national debate, and that politicians and scientists should not be making decisions without wider public discussion. The OST believes that public perceptions of science play an increasingly important role in developing policy, just as, for example, public opinion is an important part of health policy. This has been highlighted by recent science-related controversies. The controversy over genetically modified food has, in particular, reinforced awareness of the need for dialogue with the public and for informed debate.

**2.6**

Research by the Wellcome Trust<sup>6</sup> has shown that nonspecialists do not need to understand a great deal of the scientific detail in order to be able to discuss the social and ethical issues. However, it is important that people can access more information if they wish, as people want different types and levels of information before they feel comfortable to comment on an issue.

**2.7**

While stimulating and informing an inclusive debate involves the dissemination of scientific information, it also requires the identification of 'hooks' which link in with people's everyday lives and concerns – so that their attention is attracted and information retained. This will allow people to develop an awareness of the role of science in their everyday lives, and provide them with the information and confidence to contribute to national debates about science policy.

**2.8**

Organizations often have more than one reason for embarking on science communication activities – reasons such as raising the profile of an institution or cause, recruitment or fundraising. Overt public relations masquerading as science communication can lead to scepticism among the public.

**2.9**

Within the education field, but not addressed in this report, there is a conflict between the need to educate those who will be future scientists, while increasing scientific literacy among the wider population. There is increasing discussion about how the formal science curriculum can address this issue (Miller and Osborne, 1998).<sup>7</sup>

**2.10**

While some members of the science communication 'industry' are highly sophisticated, there remains a valuable 'enthusiastic amateur' segment with specific target audiences. Although there is a role for individual scientists to engage with the wider public in this way, there are also organizations that need to improve their understanding of their audiences and of traditional marketing techniques if they are to gain maximum benefit from their efforts.

**2.11**

The existing range of science communication provision is diverse, and funds are limited. There is an acceptance that better coordination would maximize impact, but there is also a reluctance to give up autonomy and submit to a broader, more strategic approach. This is partly because organizations (and individuals) have conflicting objectives, but it also reflects a historical tendency for activities to be 'provider driven' rather than responsive to the needs or desires of existing, or more importantly, potential 'consumers'.

**2.12**

It is hoped that this research provides pointers as to how the wider public can be stimulated to contribute to an ongoing, informed, debate. The notion of there being clusters of the British public alike in many ways and different in others should motivate communicators to decide how best to engage people in scientific dialogue. Group differences can be utilized to inform the medium used for science participation. The message put across in any medium should remain static across groups – rather the efforts of communicators should be put into new and innovative group-appropriate delivery methods. There remains, however, the issue of how to maintain a dialogue or a continual public consultation process. Chapter 6 attempts to draw some conclusions based on the research described in the following chapters.

# Mapping Science Communication Activities

## 3.1

This chapter outlines current science communication provision in the UK and is based on research undertaken by Research International.<sup>3</sup>

### Research method

#### 3.2

This work is intended to map the types of science communication that exist, their target audiences, the motives/rationale of the providers/deliverers and, where appropriate, funders of the work. It does not provide a comprehensive list of activities.

#### 3.3

Nine in-depth interviews were carried out face to face, and 15 more by telephone, with a number of key players in the science communication community from the public, private and voluntary sectors. A web questionnaire was widely circulated on e-mail lists and completed by 44 respondents; a further 35 people were interviewed by telephone. Extensive desk research was undertaken prior to the interviews.

### Activities

#### 3.4

Information about a range of UK-based science communication activities was collected, and a number of dimensions were identified which enabled the activities to be placed relative to each other:

- target audience – whether the general public, families, children, special interest groups or policy makers (a primary audience could be identified in most cases);

- objective of the activity – whether designed to promote understanding of science ‘fact’, generate engagement with the use of science (for society and careers), or influence science policy;
- how innovative the activity was perceived to be;
- whether the activity focused on one or more than one science, and was involved in the social sciences, humanities or the arts;
- the geographic area of influence of the activity, from local to international (although only UK-based activities were included).

#### 3.5

A priority for many of the science communicators who took part in this review is to impart a positive attitude to science. While the need to create a dialogue with the public is recognized, many activities focus on providing factual information, whether about the scientific details or about the uses of science.

This research also identified the tension between people who wish to continue with their existing portfolio of activities, and the recognition that a national strategy, or at least some coordination of effort, would be beneficial to all.

## Evaluation

### 3.6

Few science communication activities in the UK are evaluated in depth. Communicators rate evaluation highly, but most feel that they cannot justify spending scarce resources on in-depth evaluation. They rely instead on measurement of numbers involved, media coverage and solicited feedback from those who took part. Understanding and measuring impact on those who take part is complex, long-term and expensive.

## Maps

### 3.7

The range of science communication is illustrated by mapping different activities against the factors described in section 3.4. The two summary maps, Maps 3.1 and 3.2, are not intended to be exhaustive, but rather give a feel for the breadth of activity already in existence and indicate where there is an absence of activities.

### 3.8

Map 3.1 shows, for example, that 'public consultations' are aimed at the general public and tend to be policy oriented, while scientific meetings tend to be factually based and aimed at a more specialist audience with an existing

interest in the topic. The map highlights the focus of current activities on giving out information about science rather than engaging the public in science-based issues.

### 3.9

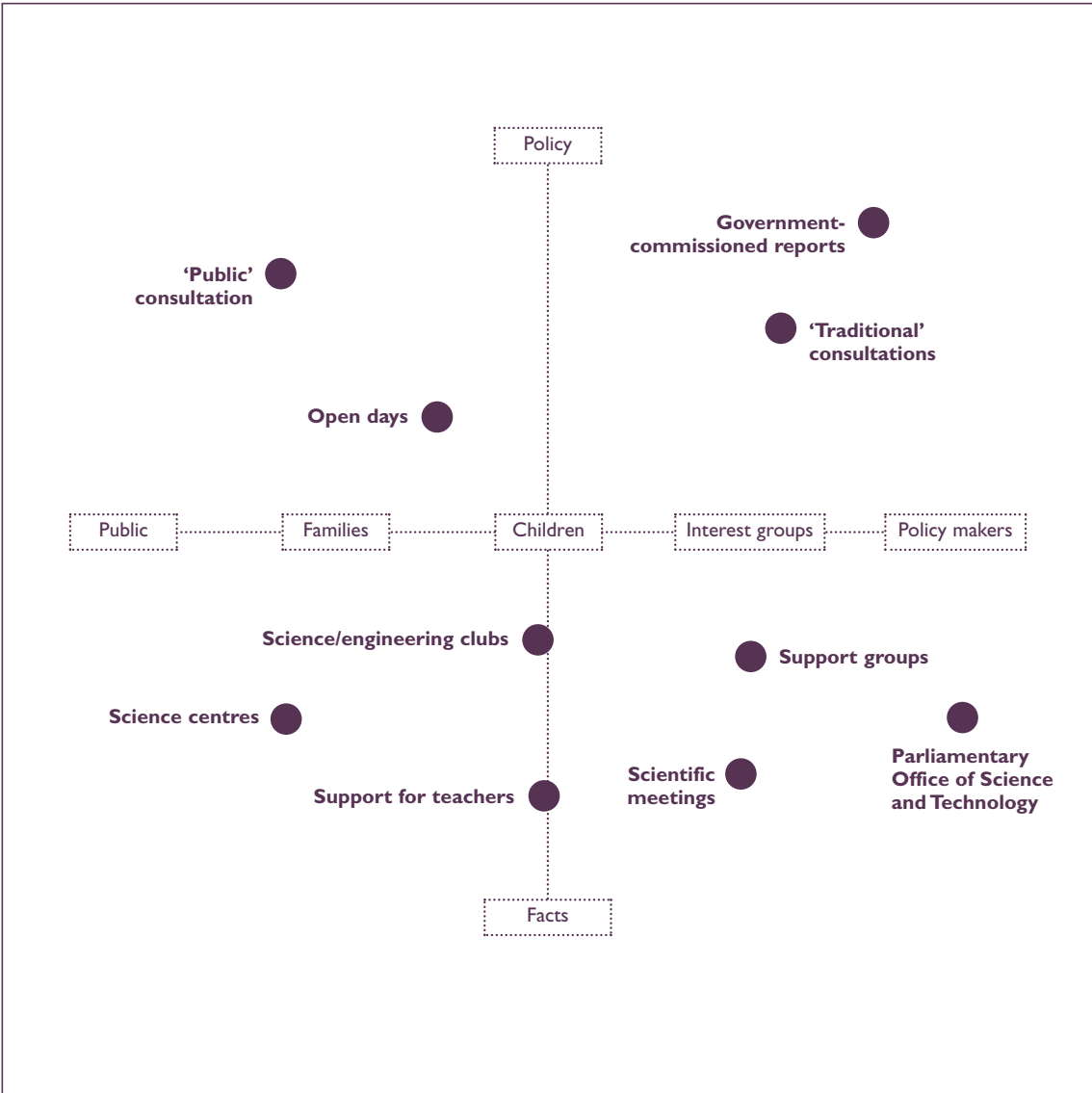
Map 3.2 also shows a variety of activity. For example, open days at scientific institutions are locally based (although they may attract people from some distance), and tend to focus on the facts and usage. Intergovernmental dialogue is more policy based and international in approach. Again it would seem that there is a relative lack of activities that engage the public in science-based issues.

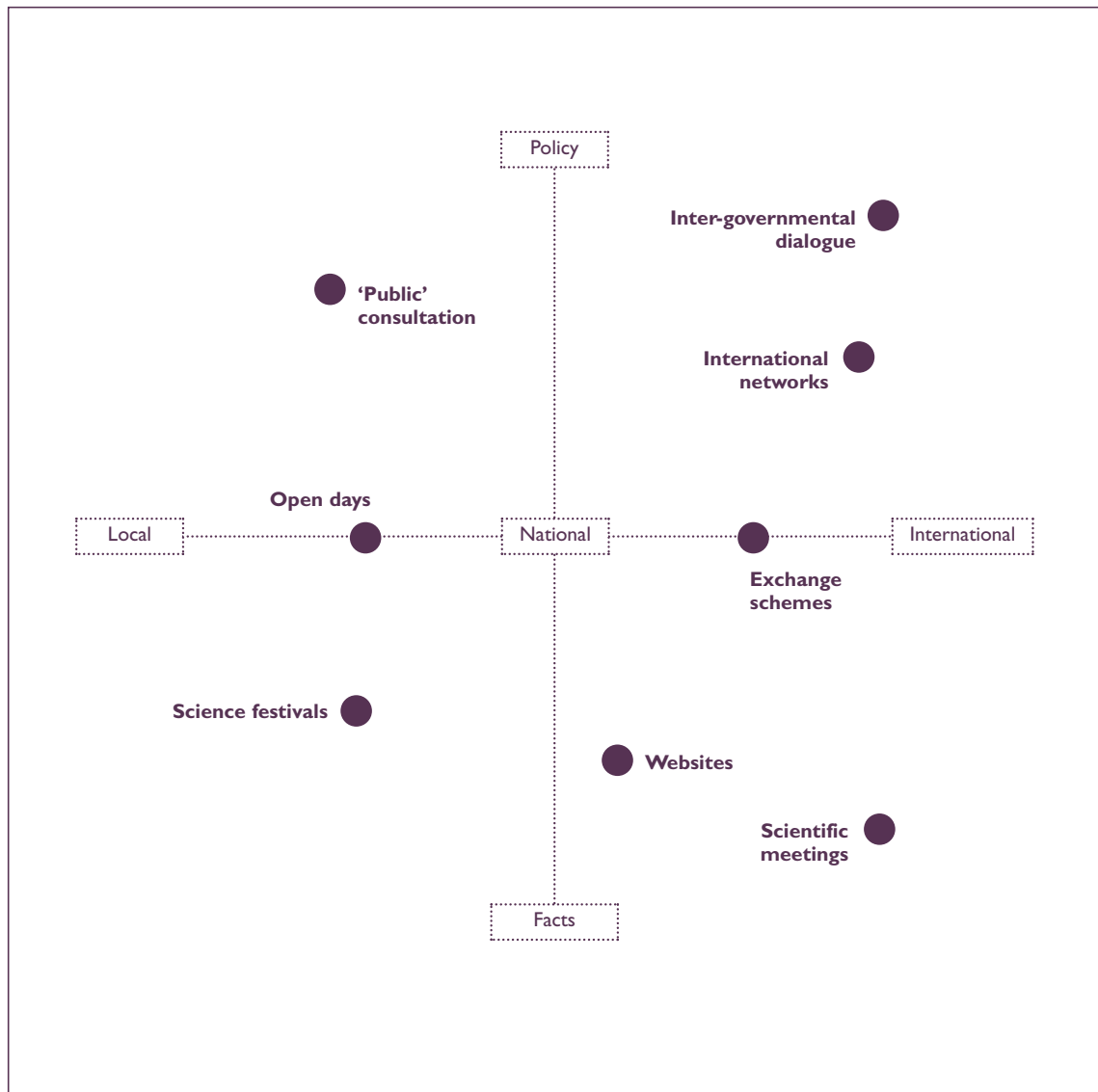
### 3.10

In principle, most potential interests are catered for, although the quality and quantity of different types of activity is not covered by this work. However, bearing in mind the requirements of science policy, and the needs of different sections of society as described in Chapters 4 and 5, it is appropriate to consider priority areas for future investment in new or existing activities.



**Map 3.1** Target audience and purpose



**Map 3.2** Geographic scope and purpose

# British Attitudes to Science, Engineering and Technology

4.1  
This research was designed to inform science communication policy and practice in Britain and to provide a rigorous baseline of public attitudes to science. Future changes in attitude can be tracked by repeating the study at regular intervals. Full sets of the data tables are available from the OST, and the technical reports can be found in Appendices 2–4.

**4.2**  
This chapter sets out the national picture from the findings of this research, and Chapter 5 details the results from a cluster analysis designed to identify different groups with respect to attitudes to science.

## Research method

**4.3**  
Two projects explored the general public's attitudes to, and expectations of, science, engineering and technology and science communication. Qualitative research was undertaken in October and November 1999, funded by the Wellcome Trust. This provided the framework for a large-scale quantitative survey funded by the OST, undertaken in January 2000.

**4.4**  
The qualitative research was designed to study, in greater depth than had been undertaken to date, public attitudes to science, engineering and technology, and how these attitudes are formed. A particular focus was to identify attitudinal groups within the population and how, if at all, attitudes vary depending upon the science or technology in question (see Appendix 2 for the topic guide). In the discussions, participants talked about science, engineering and technology, and the relationship between them as they perceive it. The participants were encouraged to use examples from their own experiences so that discussions were grounded in real issues of personal relevance.

**4.5**

Sixteen group discussions were convened grouped by age, sex, social grade and area. Six attitudinal groups were identified and typical respondents from each attitude group were reconvened into the six attitudinal groups for further exploration and understanding of these different perspectives on science, engineering and technology. From this work, 40 attitude statements were drafted for use in the follow-up quantitative stage to place respondents into attitudinal groups (Chapter 5).

**4.6**

For the quantitative study, about 1200 people were interviewed using a quota sample method, with quotas set on age, sex and social grade. Booster samples of 200 members of minority ethnic groups and of 400 in Scotland allowed more detailed analysis of these groups of special interest.

**4.7**

A critical part of this research was to construct an in-depth picture of attitudes to science in Britain. During the development of the project, it was postulated that attitudes to science were defined, to some extent at least, by general attitudes to life. The attitude statements can therefore be put into three broad groups: statements designed to explore personal confidence in coping with change and new developments (attitude to life); statements focused on perceived benefits of science, which are shown to be strongly related to interest in science (attitude to science); and statements looking at trust in politicians and regulation (attitude to authority). This provides the structure for this chapter, with comparisons to other studies where possible.

## Attitude to life

**4.8**

Table 4.1 shows the responses to the statements regarding attitudes towards life. These can be read as showing that Britain is a society broadly content to take on new personal challenges, with over 70 per cent agreeing that:

I enjoy new situations and challenges

and:

It is important for me to keep on learning new skills.

**4.9**

When it comes to controlling the world around them, most people are much more conservative. Over seven out of ten agree that:

People shouldn't tamper with nature.

**4.10**

However, there is an acceptance by over 80 per cent that:

Nothing is ever completely safe.

**4.11**

There is a general feeling that people are somewhat alienated from the political process, augmented by the recognition that there is a role for specialists in supporting the decision makers. Some 54 per cent of the sample believe:

What people like me think will make no difference to the Government.

**4.12**

There is a significant level of agreement with the need for specialist advice, with 62 per cent of people saying that:

You have to trust experienced people to make decisions.

**Table 4.1** Attitude to life

STATEMENT	FIVE-POINT SCALE					AGREE
	Strongly agree (%)		Strongly disagree (%)			
You have to trust experienced people to make decisions	12	50	17	17	3	62
What people like me think will make no difference to the Government	17	37	14	23	5	54
Politicians need specialist help to regulate some areas	26	55	8	4	1	81
People shouldn't tamper with nature	33	39	15	10	1	72
I enjoy new situations and challenges	22	49	14	9	4	71
It is important for me to keep on learning new skills	29	43	11	12	5	72
Nothing is ever completely safe	25	57	9	5	1	82

Base 1839

Percentages total 100 when the categories of Don't Know and Not Stated (not shown here) are included.

#### 4.13

In general, people who are younger, better educated, on higher incomes and in higher social grades are more positive about taking on new challenges, taking control of society and trusting those in positions of authority. While the analysis presented in Chapter 5 reveals a more complex picture, it would appear that an improved education (irrespective of whether that education is in science) provides higher income and hence a degree of security in life. In general, this security enables people to be more confident about change and more comfortable about uncertainties in the world around them.

#### 4.14

There are strong differences in attitudes to Government among ethnic groups. The Asian subgroup was most likely to believe that they could influence Government and was least likely to think that politicians need specialist advice. The situation was reversed for the African-Caribbean subsample, with the White subsample between the two, but closer to the African-Caribbean perspective. Further analysis of the sample of minority ethnic groups is planned.

#### 4.15

Some people see some elements of science as 'tampering with nature' and some new developments as 'unnatural'; hence questions about religion were included in this survey. While 37 per cent of respondents say that they are either somewhat or very nonreligious, and a further quarter are neither religious nor nonreligious, 8 per cent say they are very religious and another quarter that they are somewhat religious.

**Table 4.2** Interest in topical issues

SUBJECT	VERY INTERESTED (%)				MODERATELY INTERESTED (%)				NOT INTERESTED (%)			
	UK 2000	USA <sup>8</sup> 1998	UK <sup>9</sup> 1996	EU <sup>10</sup> 1992	UK 2000	USA 1998	UK 1996	EU 1992	UK 2000	USA 1998	UK 1996	EU 1992
Health issues*	52	-	-	-	39	-	-	-	9	-	-	-
New medical discoveries*	46	70	44	46	41	26	46	44	13	-	10	10
Education	40	-	-	-	39	-	-	-	21	-	-	-
Environmental issues*	35	52	-	56	47	40	-	38	17	8	-	6
Welfare and social exclusion	32	-	-	-	46	-	-	-	21	-	-	-
Sport	32	-	30	-	28	-	37	-	39	-	33	-
New inventions and technologies*	24	47	35	35	50	43	47	47	26	10	17	18
New scientific discoveries*	22	49	36	38	49	42	46	45	28	8	18	17
Economics	17	47	-	-	41	42	-	-	40	11	-	-
International affairs/ foreign policy	16	22	-	-	45	50	-	-	38	28	-	-
Politics	15	-	16	29	40	-	52	52	45	-	31	19
Energy/nuclear power issues*	12	29	-	-	36	49	-	-	51	21	-	-

Base: Britain 2000 1839, UK 1996 3620, USA 1998 2000. \*Science-based issues

## Attitude to science

### 4.16

Respondents were asked about their interests in a range of scientific and technological topics. Almost everyone was interested in health issues and medical discoveries (91 and 87 per cent, respectively), 74 per cent claimed to be interested in new inventions and technologies, and 71 per cent in new scientific discoveries. This compares with 82 per cent with an interest in environmental issues, 60 per cent with an interest in sport and 48 per cent with an interest in energy and nuclear power. Some comparisons can be made with surveys conducted in the USA and the EU, as shown in Table 4.2.

### 4.17

When science was discussed in the qualitative research focus groups, participants often used examples from school; initially the role of science in everyday life was mentioned only rarely. Further discussion highlighted a lack of interest in abstract scientific issues, but most participants appreciated, and the discussion broadened to, the benefits that science, technology and engineering can bring to their everyday lives.

The quantitative survey also revealed a high level of interest in science and an appreciation of the benefits it brings (see Table 4.3), although there is a degree of ambivalence about the ability of society to control what is happening (see Table 4.4).

**Table 4.3** Appreciation of science and engineering

STATEMENT	FIVE-POINT SCALE				
	Strongly agree – Strongly disagree (%)				
The achievements of science are overrated	4	18	19	42	10
Because of science, engineering and technology there will be more opportunities for the next generation	22	55	10	6	1
Science and technology are making our lives healthier, easier and more comfortable	14	54	17	9	1
The benefits of science are greater than the harmful effects	7	36	31	15	2
In general scientists want to make life better for the average person	12	56	19	7	1
We depend too much on science and not enough on faith	8	30	22	27	8
Scientists and engineers make a valuable contribution to society	21	63	10	3	>1
Britain needs to develop science and technology in order to enhance its international competitiveness	28	51	10	5	>1
Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by the Government	15	57	17	5	>1
I am amazed by the achievements of science	19	56	16	5	1

Base: 1839

Percentages total 100 when the categories of Don't Know and Not Stated (not shown here) are included.

#### 4.18

Three-quarters of respondents agree that:

I am amazed by the achievements of science

and only one in five agree that:

The achievements of science are overrated

but the statements

The benefits of science are greater than any harmful effects

and

We depend too much on faith and not enough on science

elicit more uncertainty. Some 43 per cent agree with the first of these two statements, with a third saying they neither agree nor disagree and only 17 per cent disagreeing. The latter statement elicited agreement from 38 per cent, 22 per cent remain neutral, and 35 per cent disagree.

**Table 4.4** Personal confidence

STATEMENT	FIVE-POINT SCALE				
	Strongly agree – Strongly disagree (%)				
Science makes our lives change too fast	9	36	20	29	3
The more I know about science the more worried I am	6	26	18	38	9
I cannot follow developments in science and technology because the speed of development is too fast	7	35	19	30	6
Science and technology is too specialized for most people to understand it	15	51	12	17	2
Science is out of control and there is nothing we can do to stop it	8	28	16	35	8
I don't understand the point of all the science being done today	4	24	16	39	14
Finding out about new scientific developments is easy these days	5	31	22	29	6
There is so much conflicting information about science it is difficult to know what to do	9	49	21	15	3
I am not clever enough to understand science and technology	8	30	19	32	10
It is important to know about science in my daily life	10	49	21	15	3
Science is such a big part of our lives that we should take an interest	16	58	13	8	1
It is important that young people have a grasp of science and technology	37	54	6	1	>1
I am not interested in science and don't see why I should be	3	17	18	38	21

Base 1839

Percentages total 100 when the categories of Don't Know and Not Stated (not shown here) are included.

#### 4.19

Nevertheless, three out of five agree that:

It is important to know about science in my daily life

and only a fifth agree:

I am not interested in science and I don't see why I should be

and over seven out of ten agree:

Science is such a big part of our lives that we should all take an interest.

#### 4.20

Although the overall attitudes to science were positive, the statements designed to look at personal confidence in dealing with science and the pace of development uncovered a more ambiguous picture (Table 4.4). For example, 45 per cent agreed and 32 per cent disagreed with the statement:

Science makes our lives change too fast.

However, the qualitative research revealed that participants usually underestimated their knowledge about science and the role it plays in their day-to-day lives.



#### 4.21

Education appears to bring confidence to cope with this change. Only a third agree that:

The more I know about science the more worried I am

and although 42 per cent agree that:

I cannot follow developments in science and technology because the speed of development is too fast

and two-thirds agree:

Science and technology is too specialized for most people to understand it

only 38 per cent, agree that:

I am not clever enough to understand science and technology.

#### 4.22

The 'scientific process' – scientific theories are developed in response to evidence, but as knowledge increases new theories might be developed – appears to be a difficult concept to communicate. Over half (58 per cent) of respondents agree that:

There is so much conflicting information about science it is difficult to know what to do.

#### 4.23

There is great appreciation of the benefits that science brings. Over three-quarters agree that:

Because of science, engineering and technology there will be more opportunities for the next generation

and two-thirds agree that:

Science and technology are making our lives healthier and more comfortable.

#### 4.24

Many people recognize the importance of science to the economy, with four out of five agreeing that:

Britain needs to develop science and technology in order to enhance its international competitiveness.

There is also support for basic scientific research, with over seven out of ten agreeing that:

Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by Government.

#### 4.25

However, there is scepticism about politicians and their reasons for supporting science (Table 4.5), with less than half (43 per cent) agreeing that:

Politicians support science for the good of the country.

#### 4.26

There is concern about the effectiveness of the regulation of science, and the qualitative research found that participants saw regulation as being very secretive and bureaucratic. Having some idea of the end product brings more faith in the regulatory system – hence some respondents were more positive about engineering and technology than about science. Seven out of ten agree that:

Rules will not stop researchers doing what they want behind closed doors

but only a third believe that:

Science is getting out of control and there is nothing we can do to stop it

and two out of five agree:

The speed of development in science and technology means that it cannot be properly controlled by Government.

**Table 4.5** Confidence in 'authority'

STATEMENT	FIVE-POINT SCALE				
	Strongly agree – Strongly disagree (%)				
The speed of development in science and technology means that it cannot be properly controlled by Government	8	33	20	25	4
Science is out of control and there is nothing we can do to stop it	8	28	16	35	8
Politicians are too easily swayed by the media's reaction to scientific issues, they should take more of a lead	11	42	19	15	3
Scientists should listen more to what ordinary people think	19	50	14	10	2
The media sensationalizes science	16	48	18	10	1
Science is driven by business – at the end of the day it's all about money	22	39	17	15	2
Politicians support science for the good of the country	5	38	23	20	4
Scientists seem to be trying new things without stopping to think about the risks	11	45	18	17	2
Rules will not stop researchers doing what they want behind closed doors	20	50	13	10	2
It is important to have some scientists who are not linked to business	25	53	11	4	1
Businesses that invest in science deserve to make a profit on their investments	9	49	20	12	2

Base: 1839

Percentages total 100 when the categories of Don't Know and Not Stated (not shown here) are included.

#### 4.27

Being able to see 'why' a piece of research was taking place – understanding the actual or potential benefit – was central to an appreciation of scientific research and development. This was clear in the qualitative research where, in general, respondents felt that their approval was not required, nor felt (by both scientists and regulators) to be relevant. There was a general sense of being asked to take things on trust. This, perhaps, explains the strength of feeling when the media uncover scientific research of which people do not approve. One participant commented:

'They just get on with it, no-one ever asks us.'

#### 4.28

The media provides the framework within which most people are able to talk about and conceptualize science. From the qualitative research it became clear that people do not recognize any organization or body with which they could identify as representing 'the ordinary person's point of view'. However, 64 per cent agree that:

The media sensationalizes science.

#### 4.29

Politicians, it would seem, should develop more independent policies. Over half (53 per cent) of the respondents would prefer the Government to take less notice of the press, agreeing that:

Politicians are too easily swayed by the media's reaction to scientific issues and they should take more of a lead.

#### 4.30

People also feel that scientific advice must be independent of vested interest. Over three-quarters agree that:

It is important to have some scientists who are not linked to business

although over half (58 per cent) agree that:

Businesses that invest in science deserve to make a profit on their investment.

However, there is a negative perception of the power of industry to set the agenda, with six out of ten agreeing that:

Science is driven by business – at the end of the day it's all about money.

#### 4.31

The significant minorities who are less comfortable about the involvement of industry and profit in science should not be overlooked.

#### 4.32

From the qualitative research, respondents had four main requirements regarding their relationship with scientific debates. First, they wished to be put in a position in which they were able to have a reasonable opinion. Second, they wanted a framework in which to place both breakthroughs and disasters, and everything in between. They felt the need for information that was genuinely objective and distanced from the very many, often very powerful interests participating in the debate. Third, they wanted to feel not only generally informed but also educated. Finally, they wished to be consulted, although respondents had no idea how that consultation might work.

On a broader social level, it is unclear what course of action an informed citizen could take, even if they wanted to participate or to make a decision about scientific progress actively. Scientific development nowadays was felt to revolve around bodies rather than individuals, thus the potential impact of one person was perceived as inconsequential, particularly as no equivalent bodies fighting on behalf of the individual or citizen appear to exist. The tension between wanting to be involved yet simultaneously feeling unable to participate was clearly evident in the group discussions.

'What can the man in the street do? We might all have our opinions, but what can we do?'

#### 4.33

The pattern of sociodemographic variation associated with the answers to these statements, and the more detailed analysis presented in Chapter 5, suggests that people with less education and lower incomes are less clear about the benefits of science. They are also less interested in science, less confident in coping with change and more concerned about the control of science, although they may have more confidence in those in authority and their ability to cope.

**Table 4.6** Interest in science

STATEMENT	FIVE-POINT SCALE				
	Very interested – Not at all interested (%)				
New medicines	35	49	6	7	3
Heart and other transplants	28	47	10	10	4
Research into climate change	20	40	14	18	8
Computing and the Internet	20	32	11	21	15
New and faster methods of transport	19	36	12	21	11
Telecommunications	16	44	14	17	8
Space research and astronomy	14	33	11	25	16
New methods of food production and manufacture	11	37	16	21	12
Genetic testing	11	32	13	25	16
Human fertility testing	9	30	15	26	17
Cloning	6	17	10	28	37

Base: 1839

Percentages total 100 when the categories of Don't Know and Not Stated (not shown here) are included.

#### 4.34

Different areas of science trigger very different degrees of interest (Table 4.6). While more people cite medical issues as being of interest than cite some of the physical sciences and branches of engineering, there is still a significant level of interest in the other sciences.

#### 4.35

Most of the topics shown in Table 4.6 were thought likely to be of benefit to humanity (Table 4.7), but the greatest interest was elicited by those topics perceived to be of greatest potential benefit – which are also those that are most familiar in our everyday lives.

#### 4.36

This is a crucial point for science communication and one which is well recognized by the media. People tend to be most interested in things to which they can relate in their own lives, so it is important to place science and engineering into a real-life context in order to engage people's interest. For example, the declared interest in transport, telecommunications and computing show that, within Britain, there is a strong interest in the outputs of engineering and the physical sciences. This is despite the fact that, within the scientific community, these disciplines are often thought of as being somehow less attractive to general audiences than are the biological sciences.

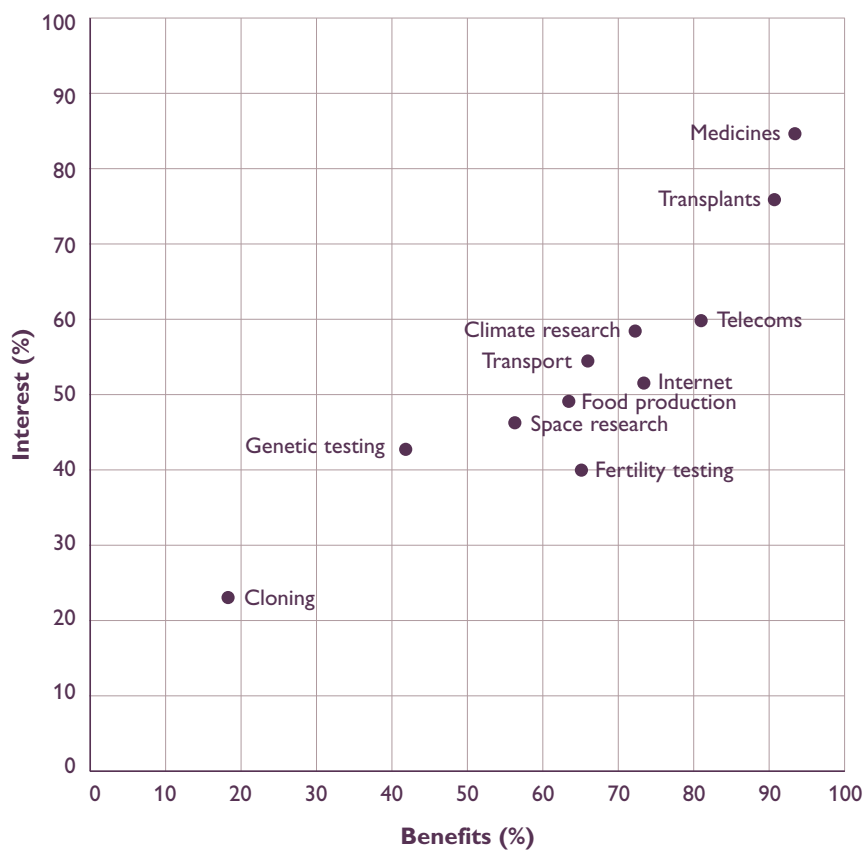
**Table 4.7** Benefits of science, engineering and technology

DISCIPLINE/TECHNOLOGY	FIVE-POINT SCALE				
	Very beneficial – Not at all beneficial (%)				
New medicines	61	33	3	>1	1
Heart and other transplants	56	36	5	2	1
Computing and the Internet	29	44	12	8	3
Research into climate change	29	42	13	8	4
Telecommunications	28	52	10	5	2
New and faster methods of transport	22	44	13	14	4
Human fertility testing	21	44	13	9	5
New methods of food production and manufacture	19	45	15	12	6
Space research and astronomy	16	41	16	16	6
Genetic testing*	11	30	11	9	6
Cloning	4	14	13	26	34

Base 1839 \*Over 400 Not Stated

Percentages total 100 when the categories of Don't Know and Not Stated (not shown here) are included.

**Graph 4.1** Relationship between benefits and interest



Base 1839

**4.37**

The clear correlation between perceived benefits and declared interest is shown pictorially in Graph 4.1. The horizontal axis shows the percentage of people who think that the issue is beneficial to humanity and the vertical axis the percentage who thought the issue was of interest.

**4.38**

Familiarity through personal experience is also an important factor in stimulating interest. The positive light in which transplant surgery is now viewed reflects the way that the technology has been proven to be useful, and the increasing likelihood that people's lives have been affected by the availability of the technique. A similar case can be made for the positive way that computing is viewed, based on the increasing role it plays in people's working and leisure time.

**4.39**

The perceived levels of benefit associated with science and engineering are important and clearly show that there is a broad appreciation of the positive role of science in a modern society. This is by no means unique to Britain and, while directly comparable data cannot be presented, a variety of international surveys present a similar picture. See for example *Europeans Opinions on Modern Biotechnology EUROBAROMETER 46.1*<sup>11</sup> (1997) published by the European Commission or the *Science and Engineering Indicators 1998*<sup>8</sup> published by the National Science Foundation, USA.

**4.40**

Interest in a specific area of science is highly correlated with the perceived benefit. Conveying the benefits of science is therefore important, as science communicators have long known. However, abstract benefits are of less value, especially to those groups who are least positive about science. The benefits must be tangible and observable in their day-to-day life.

## International comparisons

**4.41**

A number of the attitude statements used in this project have been used in previous studies in Britain and overseas,<sup>8,9,12,13</sup> and a selection of comparisons is shown in Table 4.8. Such simplistic international comparisons need to be judged cautiously. Answers to specific questions can be affected by the ordering and content of previous questions, the mode of interview (telephone, face-to-face or postal/self-completion), by cultural interpretations of meaning, even between English-speaking countries, and by the time of the survey with respect to current events.

**4.42**

Nevertheless, the data set out in the table below suggest that Britain in 2000 may be more accepting of science than it was in 1996, but that it has become more questioning about the benefits. Compared with New Zealand and the USA in 1997 and Japan in 1995, Britain in 2000 is less positive about science than these countries. Compared with Japan in 1995, however, British people are less hostile towards scientists.

**Table 4.8** International comparison

SUBJECT	PER CENT AGREEING				
	UK 2000	NZ <sup>12</sup> 1997	USA <sup>8</sup> 1998	UK <sup>9</sup> 1996	Japan <sup>13</sup> 1995
Science and technology are making our lives healthier, easier and more comfortable	67	85	89	73	51
In general scientists want to make life better for the average person	67	73*	79*	–	45†
Because of science, engineering and technology there will be more opportunities for the next generation	77	67	81	–	–
We depend too much on science and not enough on faith	38	<41	47	40	53
It is important to know about science in my daily life	59	88	85‡	51§	71‡
Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by the Government	72	84	79	–	80
Science makes our lives change too fast	44	<40‡	36	53	–
The benefits of science are greater than the harmful effects	43	45	75	45	64¶
Japan/Britain needs to develop science and technology in order to enhance international competitiveness	79	–	–	–	73

Base Britain 2000 1839, UK 1996 3620, USA 1998 2000, Japan 1995 3000, New Zealand 1997 not available.

\* Phrased as: 'Most scientists want to work on things that will make life better for the average person'

† Those disagreeing that 'There are a lot of scientists who have no interest in either human beings or society'

‡ Only disagree data available

§ Phrased as: 'It is not important for me to know about science in my daily life' so data taken from disagreement

¶ Those disagreeing with the statement 'I cannot find any value in the activities of scientists and engineers'

## Attitudes to scientists and engineers

### 4.43

As well as agreeing that scientists are working for the public benefit (Table 4.3), most people (74 per cent) believe that science and engineering represent a good career choice, while only 4 per cent do not believe this to be the case.

### 4.44

The qualitative research highlighted a perception that scientists and engineers are 'not quite like us', perhaps operating to a different moral code, being driven by the desire to discover and create while not necessarily

pausing to think about consequences; 56 per cent agreed with the statement that:

Scientists seem to be trying new things without stopping to think about the risks.

### 4.45

When describing scientists and engineers, the most common words selected were those reflecting the perceived requirements of the work: *intelligent, enquiring, logical, methodical, rational* and, surprisingly, given the statement above, *responsible*. There is still quite a strong perception that these are *male* professions, particularly engineering where male was the fourth most popular descriptive word chosen.

## Science communication

### 4.46

Information about science is an important issue for many people, although they do not want to be inundated with information which is not relevant to their needs. It is less important for people to have the information than for them to know where to find it when they need it. Most people seemed to be at least moderately confident that they could find information if they need it (Table 4.9). On balance, more people tend to believe that they are lacking information than suffering from an overload; this is marginal, however, with the majority of people believing that information provision is 'about right'. During the qualitative research, the Internet was frequently cited as being ideal for obtaining information, and there was an assumption that if people did not have access to the Internet, their local library would be able to help.

### 4.47

The qualitative research clearly showed that there was general unease about the sudden emergence of scientific news with no explanation of the rationale behind the work; Dolly the sheep was most often quoted in this context. There is still almost no awareness of the reasons for whole animal cloning.

### 4.48

Those who feel that they 'see and hear (far) too little information about science' are more likely than average to enjoy watching science programmes, reading popular science books and visiting science museums. So, those who are interested in science already want more information, but those who are not interested think they get about the right amount of information. Only 14 per cent of all respondents say that they see and hear (far) too much information about science.

### 4.49

The trustworthiness of information is an important factor, and people tend to place their trust in sources that are perceived as neutral or independent. People tend to trust university scientists, scientists working for research charities or health campaigning groups, and television news and documentaries. The next rank of trusted sources are those that are seen to have a degree of vested interest, such as environmental groups, well-known scientists and the popular scientific press. The least trusted sources are politicians and newspapers, with tabloid papers trusted by fewer people than broadsheets.

**Table 4.9** Information provision

	Per cent agreeing
These days I hear and see far too much information about science	3
These days I hear and see too much information about science	11
These days I hear and see about the right amount of information about science	55
These days I hear and see too little information about science	20
These days I hear and see far too little information about science	4

Base 1839



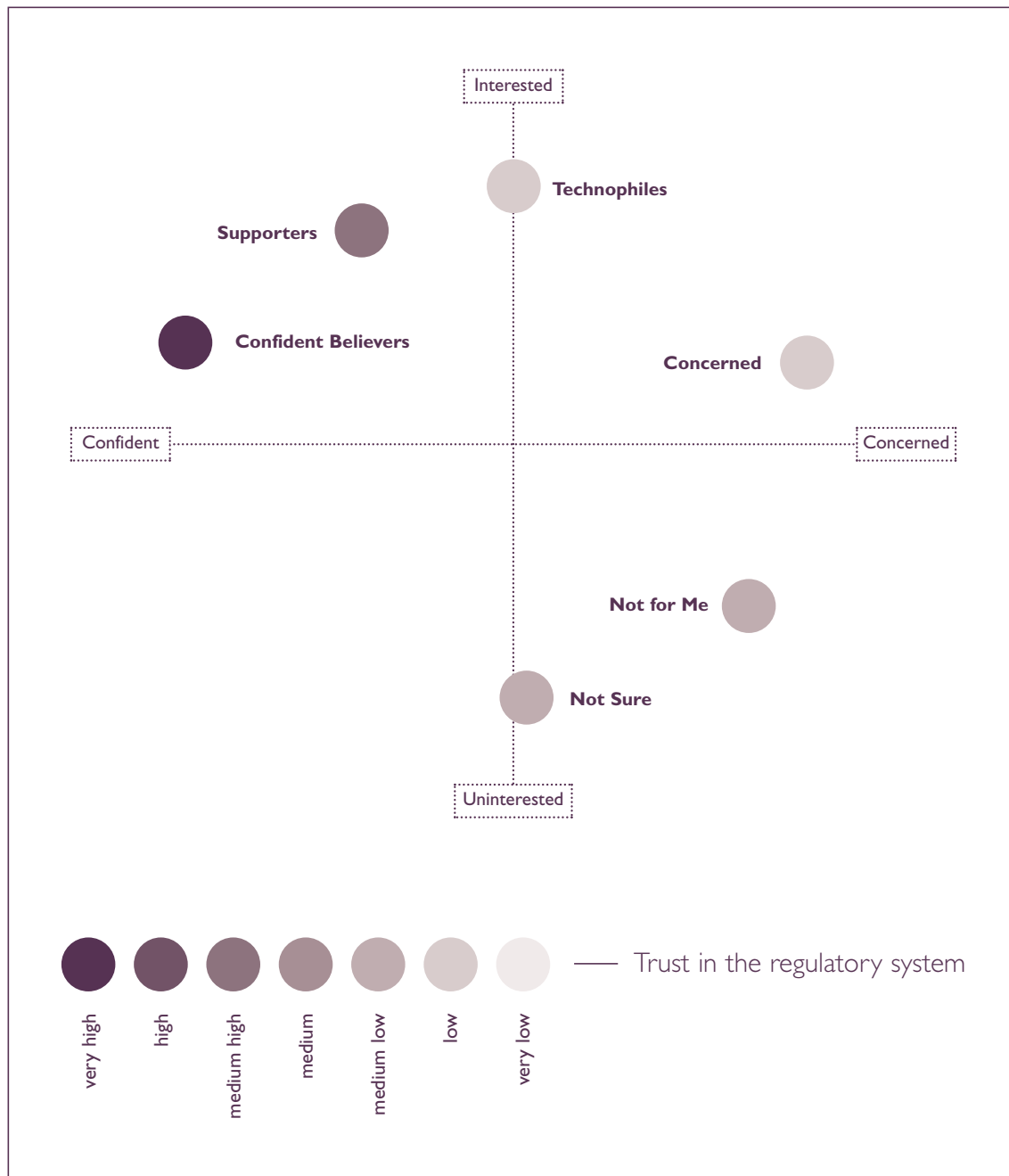
**4.50**

For almost all sources, men are more likely than women to say that they trust scientists; however, women are more likely than men to trust health campaigning groups.

**4.51**

As with overall attitudes to science, the DE social groups (semi- and unskilled workers and those wholly dependent on state benefits) are markedly more sceptical about information suppliers than the higher social groups. The important exception to this is information supplied through the television, either news or documentaries, where trust is more evenly spread.

**Map 4.1** Clusters mapped by interest, confidence and trust



## Conclusions

### 4.52

The British public is not 'anti-science'. While there is some evidence that people in Britain are not as pro-science as some other countries, the data are not fully comparable in terms of the questions asked and when the surveys were conducted.

### 4.53

The qualitative research revealed the presence of attitudinal clusters within society and suggested that, within a cluster, an individual's general attitude to different branches of science and engineering did not vary wildly. This was demonstrated by the use of examples when illustrating a point in discussion – participants would draw on experiences and knowledge from across a broad range of scientific disciplines to illustrate a social, ethical or political point. The quantitative work showed that these clusters can be identified and described in a larger sample, and that it is outlook, rather than scientific discipline, which has the most important effect on an individual's attitudes.

### 4.54

Chapter 5 describes the six attitudinal clusters identified by this research. These can be mapped in two-dimensional space against the two factors found to account for over a third of the variance in attitudes (Map 4.1).

### 4.55

Map 4.1 shows that, on balance, the British people are interested in science and enthusiastic about the benefits it brings. There is no place for complacency, however, for there is work that can be done to improve communication with a wider section of the population.

### 4.56

The more in-depth analysis presented in Chapter 5 suggests that appreciation of the benefits of science and the confidence to cope with the changes science brings is strongly linked to the security brought by higher income. Higher income and confidence is strongly correlated to a higher level of education, but this education does not need to be specific to science.

### 4.57

Of concern for Government, and hence for the science base and science-based industries, is the low level of confidence in regulation and the Government. There is more work to be done on developing the engagement of scientific policy makers with the public. This area of work is currently a high priority for the recently established biotechnology commissions, and the lessons that will be learned by these organizations could have important ramifications for other areas of science and engineering.

# Attitudinal Groups

## 5.01

This chapter describes in detail the six attitudinal clusters identified using multivariate analysis on the survey results. Clusters are defined by their responses to attitude statements and the description of each cluster seeks to highlight areas where their demographics or habits differ from national averages.

## Research method

### 5.02

Using factor and cluster analysis of the responses to 40 attitude statements, the quantitative research identified six attitudinal groups. While the statements discuss science in a rather abstract fashion they are rooted in the ideas from the qualitative research. Moreover, these groups were recognizable from the variations in attitudes observed in the qualitative research.

### 5.03

Factor analysis first reduced the 40 attitude statements to nine 'factors':

- intrinsic interest in science;
- concern over the control and direction of science;
- understanding of the subject;
- appreciation of the benefits from science;
- attitude towards change and new challenges;
- attitude towards risk;
- attitude towards authority;
- views on the sanctity of nature; and
- trust in politicians.

Factor names are not generated by the technique of factor analysis but rather are devised logically on the basis of similarities across all factors that are grouped together statistically by the technique.

**5.04**

The fact that nine factors were identified from 40 statements indicates the power of the qualitative research in identifying the relevant components of attitudes to science.

**5.05**

Factor analysis works by combining sentences which, judging from the way in which respondents have answered them, are essentially about the same thing. When tested statistically the first two factors listed above account for over a third of the variance in attitudes, and all nine factors account for just over 51 per cent of the variance.

**5.06**

Cluster analysis then assigned each respondent to a 'cluster' according to the responses they have given to the statements. This means that people within a cluster are more similar to each other than they are to those in other clusters, judged by the factors used. The six-cluster solution chosen is efficient in terms of minimizing the distance between all the members of any one cluster and means that the members of each cluster are largely homogenous. It also reflects the groupings observed in the qualitative research.

Tables showing the responses to attitude statements, media usage and demographics for the clusters as well as the overall population are presented in Appendix 1. It should be noted that the descriptions of the clusters provide 'caricatures' of the groups, and do not 'typecast' every member of the attitude cluster. For example, 10 per cent of the 'Not Sure' cluster report household incomes in excess of £25 000 per annum. Full details of how the clusters were derived can be found in Appendix 4.

As with the technique of factor analysis, cluster analysis does not generate group title. Rather, the commonalities shown by each cluster are used to derive a suitable title for the cluster.

**5.07**

The design of the study allowed the size of each attitudinal group to be assessed. Linking attitudes to use of the media and leisure time as well as standard demographic characteristics such as age, sex, social grouping and ethnicity will enable the identification of suitable communication strategies for different groups.

**5.08**

The six clusters are:

- the Confident Believers;
- the Technophiles;
- the Supporters;
- the Concerned;
- Not Sure;
- Not for Me.

The clusters are described in detail in sections 5.1–5.6, and section 5.7 highlights the key differences between the clusters.

# Confident Believers

## 5.1.1

The Confident Believers cluster (17 per cent of sample) is defined by its confident attitude, interests in a wide range of topical issues, and high levels of income and education. They tend to feel that they, as individuals, and society are in control. They differ from the Technophiles, who are also relatively high earners and well educated, in the faith they have in the political system and their ability to influence Government. The Technophiles are far more sceptical of Government.

### Attitude to life

#### 5.1.2

The Confident Believers have a positive and outward-looking attitude to life, are confident about their ability to contribute to shaping society, and have active social lives. They can be summed up by their considerably stronger disagreement, relative to the other clusters, with the following statement:

What people like me think will make no difference to the Government.

#### 5.1.3

Only one in five agree with this statement compared with just over half of all respondents. Equally defining is their strong agreement with the statement:

I enjoy new situations and challenges.

#### 5.1.4

This group shows a higher than average interest in most current affairs issues, including those related to science. Other issues where reported interest is significantly higher than average include economics and finance, sport and UK politics. Their interest in this last topic, and to some extent the attention they pay to international affairs, marks them out from the Concerned, the Supporters and the Technophiles, who are also interested in most topics listed.

### Leisure activities

#### 5.1.5

This cluster is the most likely to visit cultural institutions such as art galleries, museums, information centres at tourist sites and science centres, with two out of five claiming to have visited a museum or science centre within the last 12 months. They are also more likely than most to attend meetings, debates or talks on issues that they find of interest.

#### 5.1.6

Of all the clusters, the Confident Believers are the most likely to have attended the theatre or a concert, or to have been to pubs, clubs or restaurants in the 12 months prior to the interview. It is likely that their tendency to have higher than average household income plays an important role in their use of leisure time.

#### 5.1.7

The Confident Believers are less likely than average to have attended a science-based event or festival, and the motivation for any such attendance is strongly driven by a personal interest in specific subject matter.

## Attitudes to science, engineering and technology

### 5.1.8

This cluster has very positive attitudes towards science and engineering, with fewer than one in ten agreeing that:

The achievements of science are overrated

and as many as nine out of ten agreeing that:

Science and technology are making our lives healthier, easier and more comfortable.

More than any other group, they agree that:

The benefits of science outweigh any harmful effects.

Given their general confidence to cope with whatever comes along, it comes as no surprise that, even more than the Technophiles, they disagree with the statement that:

Science makes our lives change too fast.

### 5.1.9

When asked about individual branches of science and technology, this cluster shows a generally lower intrinsic interest in science than the Technophiles and Supporters, yet the Confident Believers show a higher than average belief in the benefits of science across all disciplines. In fact, for almost all the scientific topics investigated, this cluster was the most likely to describe a science as beneficial or very beneficial. This suggests that they appreciate the pay-offs from science but that their real interests lie elsewhere, possibly in politics or the arts.

### 5.1.10

The Confident Believers cluster is the most likely to support basic science, being most likely to agree with the statement that:

Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by the Government.

### 5.1.11

The Confident Believers' belief in their ability to shape society leads to a far higher than average confidence in the ability of society, through Government, to respond to advances in science and technology. This cluster is least likely to agree with the statements:

The speed of development in science and technology means that it cannot be properly controlled by Government

and

Science is getting out of control and there is nothing we can do to stop it.

### 5.1.12

Their feeling of being in control is reflected by them being least likely to agree that:

The more I know about science the more worried I am

and with the statement:

I cannot follow developments in science and technology because the speed of development is too fast.

### 5.1.13

A third disagree that:

Science is driven by business, at the end of the day it's all about money

making this the cluster most likely to disagree with this sentiment and the most comfortable with an industrial role for science, and 97 per cent agree that:

Businesses that invest in science and technology deserve to make a profit on their investments.

### 5.1.14

However, this is balanced by an appreciation of the need for independent expertise, and the Confident Believers are the most likely to agree with the statement:

It is important to have some scientists who are not linked to business.

Almost nine out of ten agree that:

Britain needs to develop science and technology in order to enhance its international competitiveness.

### 5.1.15

Their faith in the political system is tinged with some scepticism of those within science. While three out of five agree that:

Politicians support science for the good of the country

the same proportion agree that:

Scientists seem to be trying new things without stopping to think about the risks

and over four out of five agree that:

Rules will not stop researchers doing what they want behind closed doors.

### 5.1.16

In general, however, the Confident Believers hold scientists and engineers in high regard. Everyone in this cluster agrees with the statement:

Scientists and engineers make a valuable contribution to society.

### 5.1.17

Phrases used by this group (more than the average) to describe scientists are *intelligent, logical, rational* and *objective*, and engineers as *intelligent, enquiring* and *objective*. This cluster is the least likely to describe scientists as *mostly male*.

### 5.1.18

This cluster is also far more likely than average to describe science and engineering as good career choices. Reasons given for why people might take up science and engineering occupations include having a *good/strong/enquiring* mind or because it is interesting work; they also see it as an occupation that might be chosen because it benefits society.

## Demographics

### 5.1.19

The Confident Believers cluster is 50–50 per cent men and women, has a well above-average ABC1 representation, and the highest AB content of any cluster. They have above-average levels of formal qualifications, both generally and in science, and they are also likely to have higher household incomes than other clusters.

### 5.1.20

The Confident Believers cluster has a close-to-average ethnic profile, and the likelihood of children in the household is also average (although slightly below average if the Not for Me cluster, half of whom are aged over 65, is omitted). There is a broad representation of age groups, with the 45–54 years band being slightly higher than average and the 25–34 years band slightly below average. Nearly half of the Confident Believers live in the south of Britain, including the South-West, compared with 40 per cent of all respondents.

## Media usage

### 5.1.21

Media usage reflects the educational attainment levels, with the Confident Believers being the most likely to read a broadsheet newspaper, either daily or on Sundays. Of the broadsheets, the *Daily Telegraph* is favoured during the week, with one in ten choosing it, and nearly a third of all respondents who read the *Daily Telegraph* fall into this cluster. However, 14 per cent read the *Daily Mail*, 12 per cent the *Mirror* and 16 per cent the *Sun*. On Sundays, while 10 per cent read the *Sunday Times* and 8 per cent the *Sunday Telegraph* (again nearly a third of all those who read the *Sunday Telegraph*), 17 per cent read the *News of*

*the World*, 13 per cent the *Mail on Sunday* and 11 per cent the *Sunday Mirror*. Indeed over half read a Sunday tabloid but only one in five read a broadsheet.

#### 5.1.22

The Confident Believers enjoy watching documentaries (including 'fly-on-the-wall' programmes), drama, sport and current affairs. Half of this cluster watch between 15 and 28 hours of television each week.

#### 5.1.23

Members of this group are more likely to listen to the radio than members of other clusters; only one in ten claim not to listen to the radio, compared with about one in seven of all respondents. While three-quarters listen to music stations, they show above average use of speech-based stations such as Radios 4 and 5.

#### 5.1.24

The Confident Believers are among those most likely to have recently read a book and while they are average consumers of fiction they are more likely than average to read most types of non-fiction. It is also the cluster most likely to read magazines on a regular basis. Magazines read more frequently than average by this group include men's lifestyle, hobby and science magazines.

#### 5.1.25

The Confident Believers are far more likely than average to have access to a computer and to the Internet (second only to the Technophiles on both these measures). However, only 30 per cent claim to use the Internet.

## Access to science information

#### 5.1.26

The Confident Believers are more likely than others to believe that they have access to the right amount of information about science and engineering. Of those dissatisfied, there is a three-to-one ratio of people who believe that they do not see enough information about science. This is consistent with the slight lack of personal confidence shown in the less positive response to statements such as:

Finding out about scientific developments is easy these days

and:

There is so much information about science it is difficult to know what to do.

#### 5.1.27

When asked about the ways in which they receive information about science, the Confident Believers give the widest range of sources, citing almost all vehicles tested far more than average. They are the most likely to cite national press, national radio, television documentaries and Government information. This does not necessarily mean that information is actively being sought, rather that they are aware of what is going on around them.

#### 5.1.28

Although already one of the main users of the Internet, this is the medium highlighted as being an important additional way that this cluster would like to receive information about science, engineering and technology.

#### 5.1.29

The Confident Believers are more trusting than others of almost all sources of information about science, including sources within science such as university scientists, well-known scientists, science books and scientists within research charities. As might be expected from their media usage, they are more likely to trust broadsheet newspapers, and TV news and current affairs programmes than other clusters. When asked to indicate from a list of possible sources of information about scientific facts who they would least trust, half of this cluster, a higher proportion than in any other group, selected people working for tabloid newspapers.

## Summary

#### 5.1.30

The Confident Believers form 17 per cent of the total sample interviewed. They tend to be positive, self-confident and outward looking. They are interested in science because they appreciate the benefits it brings but their primary interests are in political issues and the arts and humanities. Their interest in politics means that they tend to have faith in the regulatory system and believe that they can influence Government. They tend to be well-off, well educated, middle-aged, equally balanced between men and women, and more likely to live in the south of Britain.



# Technophiles

## 5.2.1

The Technophiles – 20 per cent of the respondents – appear to combine the Confident Believers' feeling of being in control, the Concerned's cynicism of Government, and the Supporters' excitement about science. The Technophiles' cynicism does not extend to a wider view of 'elite groups' or those in positions of relative authority, as their view of scientists is more positive and their interest in science is more measured than that of the Supporters. The Confident Believers, the Concerned, the Supporters and the Technophiles are all generally positive about science and its benefits.

## Attitudes to life

### 5.2.2

The Technophiles have a positive attitude to change. Although four of the six groups are highly positive about change, only the Confident Believers are less likely to agree that:

People shouldn't tamper with nature

and are therefore more positive about control. In the Technophiles group, 86 per cent agree that:

I enjoy new situations and challenges

compared with 71 per cent of the sample as a whole and nearly nine out of ten agree that:

It's important for me to keep on learning new skills

compared with 72 per cent of the total.

### 5.2.3

In many respects the Technophiles are similar to the Confident Believers; where they differ is in their view of how much influence they, or people like them, can have on Government. While over half of the Technophiles agree that:

What people like me think will make no difference to the Government

less than one in five of the Confident Believers agree with this statement. The Technophiles' cynicism of politicians is again reflected in their lack of agreement with the statement:

Politicians support science for the good of the country.

Only the Concerned and the Not Sure clusters are less likely to agree with this statement. However, unlike the Concerned, and more than any other group, this cluster does not agree with the statement:

Scientists seem to be trying new things without stopping to think about the risks.

This positive view of scientists is reflected elsewhere.

**5.2.4**

Again, like the Confident Believers, they show above-average interest in a whole range of topical and political issues. Where they differ markedly is in the attention they give to energy and nuclear power issues – three out of five of the Technophiles express an interest in these topics, compared with just under half of all respondents and just over half of the Confident Believers.

## Attitudes to science

**5.2.5**

The Technophiles group is overwhelmingly supportive of, and interested in, science. Only one in ten, compared with one in five of all respondents, agree that:

The achievements of science are overrated

and fewer members of this group than of any other agree that:

I am not interested in science and I don't see why I should be.

Almost all of the Technophiles agree that:

Because of science, engineering and technology there will be more opportunities for the next generation

and that:

It is important that young people have a grasp of science and technology.

Over four out of five agree both that:

It is important to know about science in my daily life

and that:

Science, engineering and technology are making our lives healthier, easier and more comfortable.

**5.2.6**

Nevertheless, only half agree that:

The benefits of science are greater than the harmful effects

although this is greater than the average at 43 per cent. Less than a quarter believe:

We depend too much on science and not enough on faith.

**5.2.7**

The enthusiasm of the Technophiles for change, and their personal confidence in dealing with scientific and technical issues, is reflected in their below-average agreement with the statements:

Science makes our lives change too fast

I cannot follow developments in science and technology because the speed of development is too fast

and

Science is getting out of control and there is nothing we can do to stop it.

**5.2.8**

Information about science reassures the Technophiles, with only one in five agreeing that:

The more I know about science the more worried I am

compared with a third of all respondents.

Furthermore, while two-thirds agree that:

Science and technology is too specialized for most people to understand it

it would appear that they do not include themselves in this group – only one in five agree that:

I'm not clever enough to understand science and technology

compared with over a third of all respondents.

### 5.2.9

The Technophiles appear to believe that the Government does not handle science well. Only the Concerned are more likely to agree that:

Politicians are too easily swayed by the media's reaction to scientific issues, they should take more of a lead

and more than 80 per cent of this group agree that:

The media sensationalizes science.

### 5.2.10

Where this cluster really stands out is in their view of the importance to Britain of science-based industries. Almost all of the Technophiles agree that:

Britain needs to develop science and technology in order to enhance its international competitiveness

and only one in ten agree that:

I don't understand the point of all the science being done today.

With their high levels of science qualifications it is possible that this group may be disproportionately employed in science-based industries, although a direct question about this was not asked.

### 5.2.11

In general, the Technophiles are more likely to express interest in most of the scientific topics listed (see Table 16 in Appendix 1), and they were more likely to see most of these as beneficial to humanity. Their top three subjects for interest and benefits are the same as those of the other groups, and a similar correlation between interests and perceived benefits can be observed.

### 5.2.12

The Technophiles more likely than any other group to be interested in new and faster methods of transport, computing and the Internet, genetic testing, new methods of food production and manufacture, human fertility testing, and cloning (in that order). They are more likely to see the benefits of new medicines, telecommunications, research into climate change, and new methods of food production and manufacture.

## Attitude to scientists

### 5.2.13

The Technophiles have a generally positive view of scientists and engineers. As with most of the clusters, they tend to believe that:

In general scientists want to make life better for the average person.

### 5.2.14

All the Technophiles agree that:

Scientists and engineers make a valuable contribution to society

and of all the clusters they are least likely to agree that:

Rules will not stop researchers doing what they want behind closed doors.

### 5.2.15

While the general view this group holds of scientists (in terms of the sort of words they would use to describe them) is much the same as all the groups, there is some indication that they see scientists as being slightly more 'human' and certainly as being more creative. The Technophiles are the most likely to say that scientists are socially responsible.

### 5.2.16

As with most groups, in general the Technophiles think that a career in science and engineering is a good choice. They perceive such a career to be interesting for those with strong, enquiring minds, and their interest in the search for knowledge and for discovery is evident in the reasons they give for people choosing to become scientists or engineers.

## Demographics

### 5.2.17

The Technophiles are the most male of the clusters (55 per cent male). They tend to be aged 35–44 years, have an above-average representation in social grades A, B and C1, and to have above-average household incomes. This group is the most likely to have qualifications in science or engineering at degree level or above, and the least likely to have no qualifications. As might be expected from their age, they are more likely than average to have children aged five and ten years in their household.

### 5.2.18

This group is the least likely to claim to hold religious beliefs, with a third saying they have no religion.

## Media usage

### 5.2.19

The Technophiles are more likely than any other group to say that sports programmes are their favourite type of programme. They also enjoy watching documentaries and science programmes more than any other cluster, and they are the least likely to claim to enjoy soaps, quiz and game shows, chat shows and variety/family shows.

### 5.2.20

Of all the groups, the Technophiles watch television for the least amount of time. When they do watch, they are most likely to watch BBC1 and satellite stations, the latter possibly reflecting their interest in sport.

### 5.2.21

The Technophiles are also among the least likely to listen to the radio. When they do listen, they are least likely to choose a music station (although seven out of ten still do), and more likely than any other group to choose talk stations, especially Radio 4 and to a lesser extent Radio 5.

### 5.2.22

The Technophiles are less likely than any other group to read a newspaper on a regular basis (perhaps because they rely on Radio 4 for their news); when they do it is likely to be the *Daily Mail*, the *Mirror* and the *Sun*. Nevertheless, the Technophiles are twice as likely as all respondents taken together to read the *Guardian* and over a third of those who regularly read the *Independent* fall into this cluster.

## Leisure interests

### 5.2.23

They are less likely to read a Sunday newspaper on a regular basis; when they do they are least likely of the clusters to choose a tabloid, although most Technophiles still do. They are most likely to read the *Mail on Sunday*, *News of the World* or *The Sunday Times*. However, as with the dailies, one-third of all those who read the *Independent on Sunday* fall into this cluster.

### 5.2.24

In the previous 12 months, the Technophiles and the Confident Believers are more likely than the other groups to have read a book. Their reading patterns do not stand out, except for a greater inclination to read science fiction, and science and engineering textbooks. These latter reading habits probably reflect their above-average levels of qualifications in science, and perhaps an occupation related to science; such specific details were not collected.

### 5.2.25

This group is the most likely to read men's lifestyle magazines such as *GQ* (although only just ahead of the Confident Believers). They are by far the most likely to read science magazines.

### 5.2.26

As would be expected, given the picture of this group gained so far, they are more likely than any other group to have access to a computer, especially at home. They are also the most likely to have access to the Internet, although less than half have access (again, they are likely to have access at home). While they are more likely to use the Internet than other groups, only 38 per cent do so.

### 5.2.27

Along with the Confident Believers, the Technophiles are the most likely to have visited a museum, science centre, historic house or garden, art gallery, or been to the theatre, a concert or the opera in the 12 months prior to interview. They are the most likely to have visited a zoo or a theme park, which may reflect the presence of children in their households, or to have been to the cinema or to a sporting event in this time period. They are also the most likely to have been to a lecture or a talk. It is important to note, however, that it is still a minority who have done each of these things in the previous 12 months. However, the data suggest that the Technophiles go out to these types of venue more regularly than other groups.

### 5.2.28

As might be expected from their income and lifestage, the Technophiles are the most likely to list DIY among their leisure activities, with over a third claiming this as a pastime. Among their leisure interests, nearly half list going to the theatre and the cinema and playing sport or otherwise exercising. While this is the cluster least likely to spend time watching television, three-quarters still include this among their leisure activities. This group are noticeably more likely to cite 'collecting things' as a hobby, perhaps with their children.

## Science information

### 5.2.29

Television documentaries, and news and national newspapers dominate how the Technophiles find out about science, as they do with all groups. However, the Technophiles and the Confident Believers are noticeable in also citing national radio and magazines, the Internet and the Government as sources of information.

### 5.2.30

Like the Confident Believers, the Technophiles like receiving information on science from the Internet. However, this is only relevant to a minority of the group – 30 per cent of the Technophiles would like to receive information about science through the Internet (compared to an average of 17 per cent). Television documentaries are preferred by 65 per cent and television news by 58 per cent.

### 5.2.31

This group is more likely to receive information about science in libraries than other groups and is somewhat more likely to cite libraries as a preferred place for finding information than any other group.

## Science communication

### 5.2.32

The Technophiles tend to trust scientists in universities and those working for charities, especially well-known figures, as sources of information about science. When asked which source they most trust from a list of possible sources, this group was noticeable in choosing science books, which reflects their reading habits. Nearly half claim to trust tabloid journalists the least.

### 5.2.33

The majority of this group (three out of five) say that:

These days I hear and see about the right amount of information about science

while just over a quarter say that they hear and see too little. Although some other groups want more science information than this rather well informed and pro-science group, this is almost certainly because this group is already well tapped in to existing sources of information. Two out of five of the Technophiles agree that:

Finding out about science is easy these days.

## Summary

### 5.2.34

The Technophiles is the largest cluster, encompassing one-fifth of the respondents. Confident, pro-science, well educated in science, but sceptical of politicians, this largely ABC1 group is 55 per cent male and tends to be the '30-somethings' with children aged between five and ten years. Members of this group are already interested in science and engineering, well aware of the benefits, and well tapped into sources of information. They tend to be confident that they know how to get information when they need to.

# Supporters

## 5.3.1

The Supporters cluster encompasses 17 per cent of the respondents. They are amazed by science and appreciate the benefits of science, engineering and technology and feel able to cope with the changes it brings. Their confidence is based on a positive attitude and self-confidence. They are not as knowledgeable about science as the Technophiles and have less confidence in scientists, but they do not share the Technophiles' more sceptical view of politicians.

### Attitude to life

#### 5.3.2

The Supporters relish personal challenges and are the most likely to agree with statements such as:

I enjoy new situations and challenges

and:

It is important for me to keep on learning new skills.

#### 5.3.3

At a societal level, however, there is a more conservative approach, this cluster being among the most actively religious. They are most likely to agree that:

People shouldn't tamper with nature

and they are realistic enough to be the most likely to agree that:

Nothing is ever completely safe.

The level of agreement with the latter statement is 95 per cent compared with an overall average of 82 per cent.

#### 5.3.4

The Supporters show a universally high level of interest in current affairs, with a higher than average degree of interest in all the topics explored. They stand out as being more interested than any other group in education, music and new films. This strong interest in education is a reflection of the expressed need to continue to develop personal skills.

### Leisure activities

#### 5.3.5

The Supporters show an average likelihood of visiting cultural institutions such as art galleries, museums, historic sites or science centres, and of attending meetings, debates or talks on issues that they find of interest. For less overtly cultural activities, the Supporters are second only to the Technophiles in their likelihood of visiting cinemas or theme parks. When considering places that had not been visited in the last 12 months but which the Supporters would like to visit, the theatre and scientific institutions – such as science centres, zoos and planetaria – were picked out more often than average.

#### 5.3.6

The Supporters show an average tendency to partake in proactive pastimes such as going out to pubs and clubs, walking, DIY and gardening, and they have a slightly lower-than-average interest in passive pastimes such as watching television, reading or watching sport. They are the second most likely group to partake in sport or exercise (34 per cent; albeit only slightly more likely than the Confident Believers and the Concerned). They are the most likely to cite going to a place of worship in their spare time (18 per cent), and the least likely to say that they have no religion; seven out of ten are Christian, a proportion higher only in the Not for Me group.

## Attitudes to science, engineering and technology

### 5.3.7

Like the Confident Believers and the Technophiles, the Supporters have a generally positive attitude towards science and engineering and believe that they can keep up with the speed of scientific and technological advance. Nine out of ten claim:

I am amazed by the achievements of science

and believe that:

Science is such a big part of our lives that we should all take an interest.

### 5.3.8

More than any other cluster, they agree that:

Finding out about new scientific developments is easy these days.

### 5.3.9

They are least likely to agree that:

There is so much conflicting information about science it is difficult to know what to do

and only a third agree that:

I am not clever enough to understand science and technology.

They are one of the least likely groups to agree with the statement:

I cannot follow developments in science and technology because the speed of development is too fast.

### 5.3.10

The Supporters have a high degree of faith in the role of the political establishment in science and engineering. They are the most likely (63 per cent compared with an average of 43 per cent) to agree that:

Politicians support science for the good of the country

and least likely (35 per cent compared with an average of 53 per cent) to agree that:

Politicians are too easily swayed by the media's reaction to scientific issues, they should take more of a lead.

### 5.3.11

When considering individual branches of science and technology, this group shows a higher-than-average interest in science across all disciplines, and, while still being more interested in medical science, they report among the highest levels of interest in the physical sciences and engineering. The degrees of interest in space research and astronomy, computing and the Internet, telecommunications and transport are 57 per cent, 65 per cent, 71 per cent and 64 per cent (compared with averages of 46 per cent, 52 per cent, 60 per cent and 55 per cent, respectively).

### 5.3.12

As discussed above, there is a strong correlation between professed interest and perceived benefit so it is not surprising that the Supporters are more likely than average to describe the different branches of science and engineering as beneficial or very beneficial.



## Attitude to scientists

### 5.3.13

The Supporters' positive attitude to science, engineering and technology in the abstract is borne out by a similar attitude to scientists and engineers. With a score of 81 per cent (compared with an average of 67 per cent), the Supporters are one of the three groups equally most likely to agree that:

In general scientists want to make life better for the average person.

### 5.3.14

When describing scientists, this group uses phrases such as *intelligent, enquiring, methodical, logical and responsible*; they are less likely than average to use the terms *secretive* or *funded by industry*, but more likely than average to describe scientists as *male*, and, interestingly, as *independent*. Common phrases used by this cluster to describe engineers are *intelligent, logical, responsible* and *male*.

### 5.3.15

This cluster is the most likely, alongside the Confident Believers, to describe science and engineering as good career choices (85 per cent compared with an average of 74 per cent). Reasons given include the opportunity to provide benefits to society, well paid or interesting work with good career opportunities, and the opportunity to make new discoveries.

## Demographics

### 5.3.16

The Supporters have a spread of social grade and household income that is very close to average. While a third have no qualifications, they are more likely than average to have formal qualifications associated with school education (O-and A-level equivalent) but slightly less likely to have higher qualifications. In terms of scientific qualifications, this group is the second most likely to have technical qualifications at O-level equivalent.

### 5.3.17

The Supporters group shows a slight gender bias, being 53 per cent male. It is also a relatively young cluster, with the lowest proportion of members aged 65 or over. This cluster is equal second most likely in their propensity to have children in the household; and, as this cluster is over-represented in the 35–44 years age group as well as the younger sections, the age profile of children shows a wider spread than in the Not Sure cluster.

### 5.3.18

This cluster, along with the Not Sure cluster has the highest proportion of non-white respondents (9 per cent), and there is a slight over-representation of the African-Caribbean subgroups (3 per cent compared with an average of 2 per cent).

## Media usage

### 5.3.19

Media usage reflects the broad range of sociodemographics of the Supporters. This group is the most likely to regularly read a daily newspaper – just over a quarter take no daily paper compared with an average of a third. Broadsheet readership is close to average, while they are more likely to read a tabloid than any other cluster. Readership of both the *Sun* and the *Daily Mirror* is above average.

### 5.3.20

The Supporters are less likely to watch large amounts of television. BBC watching is slightly below average, but the Supporters are highest users of ‘new’ technologies – 18 per cent use either cable or satellite as their main viewing channels, compared with an average of 14 per cent.

### 5.3.21

As a group they have a close-to-average level of radio listening, which is most likely to be music based, especially current rock and pop, probably reflecting their younger age profile.

### 5.3.22

The Supporters show a below-average inclination to read books, but almost three-fifths of this group have read a book in the last 12 months. Reading is split between fiction and non-fiction categories, with romance and general science interest books being two categories that they have a higher-than-average tendency to read.

### 5.3.23

Half the Supporters read magazines on a regular basis. Women’s weekly and hobby magazines are the most widely read, although an above-average number also read women’s monthly and sports magazines.

### 5.3.24

Half of the cluster has access to a computer, most usually at home. A third has access to the Internet, again often at home, but only a quarter claim to use the Internet.

## Access to science, engineering and technology information

### 5.3.25

The Supporters report that they receive information about science from the television news and the national press; they are no more likely than average to cite television documentaries (although six out of ten do). Other favoured ways of getting information about science are leaflets and Government information.

### 5.3.26

This cluster shows a relatively high degree of trust in a variety of sources of information and shows a significantly higher-than-average degree of trust in Government and industrial scientists (30 per cent and 25 per cent compared with averages of 20 per cent and 21 per cent, respectively).

## Summary

### 5.3.27

This relatively young group (17 per cent of the total) tends to be amazed by science, engineering and technology and feels self-confident enough to cope with rapid change. They also tend to believe that the Government has got things under control. Further research may find that this group has a high proportion of ‘early adopters’ (those who buy new products as soon as they go on the market).

# Concerned

## 5.4.1

The Concerned is the smallest cluster (13 per cent of the sample) and is defined by a scepticism of authority and the regulatory system. They, like the Confident Believers, tend to be interested in a range of topical issues, but the Concerned do not share the faith of the Confident Believers in regulatory systems and the way science is being used, and they are sceptical of authority and of scientists and engineers.

### Attitude to life

#### 5.4.2

While the Concerned have a relatively positive attitude to life and change, they are sceptical of those in positions of power and authority. Over four out of five agree that:

I enjoy new situations and challenges

and:

It's important for me to keep on learning new skills

and almost all agree that:

Nothing is ever completely safe.

However, they are the least likely to agree that:

You have to trust experienced people to make decisions

and are slightly more likely to agree that:

What people like me think will make no difference to the Government.

They are the most likely to agree that:

Politicians need specialist help to regulate some areas.

#### 5.4.3

They also have considerable interest in current affairs and political issues, including science issues – 73 per cent (compared with an average of 62 per cent) express at least moderate interest in science issues.

## Attitude to science, engineering and technology

### 5.4.4

The Concerned group has a positive attitude to science, and they retain a feeling that they should be interested in the world, but they are sceptical about authority and the integrity of those in positions of power.

### 5.4.5

Nearly three-quarters are:

Amazed by the achievements of science

and about four out of five agree that:

Science is such a big part of our lives that we should take an interest

that:

Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by the Government

and that:

Scientists and engineers make a valuable contribution to society.

Some 64 per cent agree that:

It is important to know about science in my daily life

and almost all agree that:

It is important that young people have a grasp of science and technology.

### 5.4.6

On the other hand, 54 per cent, more than in any other cluster, agree that:

We depend too much on science and not enough on faith.

### 5.4.7

This statement has been taken from a US survey for comparison and is less effective in Britain. It is interesting that this group are the most likely to agree with the statement, despite the fact that their declared level of religiousness is only slightly higher than average.

### 5.4.8

Only 15 per cent agree that:

The benefits of science are greater than the harmful effects

compared with 43 per cent of all respondents. Hence, while they are amazed by science, their scepticism of the way it is being used is evident. About twice as many as average agree that:

The achievements of science are overrated

although it is still a minority (40 per cent) who hold this view, and as a group they are least likely to agree that:

Because of science engineering and technology there will be more opportunities for the next generation.

#### **5.4.9**

Similarly, while two-thirds of the whole sample agree that:

Science and technology are making our lives healthier; easier and more comfortable

less than a third of the Concerned agree with this idea.

#### **5.4.10**

They also tend to believe that science is out of control, moving too fast and leaving them behind. Two-thirds agree that:

Science makes our lives change too fast

compared with 44 per cent on average. Six out of ten, compared with just over a third of all respondents, agree that:

Science is getting out of control and there is nothing we can do to stop it.

#### **5.4.11**

Far more of the Concerned than of any other cluster agree that:

The speed of development in science and technology means that it cannot be properly controlled by Government

and nine out of ten, again far more than in any other cluster, agree that:

Scientists seem to be trying new things without stopping to think about the risks.

They are also more likely than any other group to agree that:

Scientists should listen more to what ordinary people think.

#### **5.4.12**

Nevertheless, they realize that:

Britain needs to develop science and technology in order to enhance its international competitiveness,

but fewer in this group than in any other agree that:

Politicians support science for the good of the country

and almost all agree that:

Rules will not stop researchers doing what they want behind closed doors

and that:

It is important to have some scientists who are not linked to business.

#### **5.4.13**

Similarly, they have a lack of faith in politicians, with three-quarters agreeing that:

Politicians are too easily swayed by the media's reaction to scientific issues and they should take more of a lead.

#### **5.4.14**

Giving the Concerned more information is unlikely to increase confidence in science, as two-thirds (compared with one-third of all respondents) agree that:

The more I know about science the more worried I am.

#### **5.4.15**

Part of their concern is due, more than any other cluster, to the belief that people

Cannot follow developments in science and technology because the speed of development is too fast

and that:

Science and technology is too specialized for most people to understand it.

**5.4.17**

Unlike the Not Sure and the Not for Me clusters, only a third agree that:

I am not clever enough to understand science and technology

but they feel confused, and over three-quarters, more than any other cluster, agree that:

There is so much conflicting evidence about science it is difficult to know what to do.

**5.4.18**

Only a quarter believe that:

Finding out about scientific developments is easy these days.

**5.4.19**

More of this cluster than of any other ask for more information about science probably because they hold education and science to be important, even though the more they know about it the more worried they become.

**5.4.20**

The Concerned tend to see the whole scientific enterprise as being driven by business. More of this group than of any other agree that:

Science is driven by business, at the end of the day it's all about money.

**5.4.21**

Their interest in science is correlated with their rating of the benefits. From the list of scientific developments, they tend to be interested in medical developments and climate change. The four areas which most of them cited as of interest – new medicines, heart and other transplants, climate change and telecommunications – are identical to the four developments they agree on as beneficial.

## Attitude to scientists

**5.4.22**

When describing scientists, the Concerned have a greater tendency to choose words such as *secretive, detached, narrow-minded, selfish, uncommunicative, funded by industry* and *not responsible* (far more often than other groups). Only 37 per cent compared with two-thirds of the total agree that:

In general scientists want to make life better for the average person.

**5.4.23**

This group, where six out of ten are female, are also slightly more likely to see scientists as male than respondents in general.

**5.4.24**

Their view of engineers is more positive. This is the only group for whom this is true, but it is a phenomenon observed in the qualitative research. While the Concerned view engineers as being cold and detached, they also tend to see engineers as more socially responsible and generally appear to be more sympathetic towards them than other groups.

**5.4.25**

Given this view of scientists and engineers it is perhaps a little surprising that three-quarters of them think that a career in science or engineering is a good choice.

## Demographics

**5.4.26**

The Concerned live in households of slightly above average income. Six out of ten are female, but their age, social class, likelihood of having children living with them and educational achievement distributions are all in line with the sample as a whole. Some 44 per cent have some sort of science qualification and the distribution of qualifications in science is close to the average, albeit with slightly higher than average A levels or degrees in science and engineering subjects.

**5.4.27**

This group is best described as 'somewhat religious' – a third fall into this category compared with a quarter of all respondents.

## Media usage

### 5.4.28

The Concerned enjoy watching 'more serious' television programmes, with above average numbers viewing current affairs, documentaries, news, wildlife, arts and education programmes as well as variety/family programmes, films and comedy. However, they are in line with the sample as a whole, with 17 per cent claiming that soaps are their favourite programmes. They are relatively frequent television viewers, and they are more likely than average to watch BBC1 and BBC2 and less likely to watch cable or satellite than the sample as a whole. The Concerned may watch relatively more television because they are the group most likely to watch children's programmes, presumably with their children, as they value education in addition to adult television.

### 5.4.29

This group listens to the radio slightly more than other groups, and an above-average number listen to classical music and local BBC talk radio stations.

### 5.4.30

A third of the whole sample do not read daily newspapers on a regular basis and the Concerned group is no different. Those who read dailies tend to choose the *Sun* and the *Daily Mail*, with one in five reading each of these titles regularly. On Sundays, 38 per cent of all respondents and 37 per cent of this group do not read a paper regularly. The two-thirds of the Concerned who do read a Sunday paper regularly are slightly more likely to read tabloids. The *News of the World* is the most widely read, although this group read the *Mail on Sunday* and *Sunday Express* far more than average.

### 5.4.31

Two-thirds of this group have read a book in the last 12 months. In line with their television viewing, they were more interested in reading non-fiction than fiction – 64 per cent had read a fiction book but 70 per cent had read a non-fiction book in the previous 12 months. When choosing fiction books, they were slightly more likely than most to choose science fiction, surprisingly, and the classics, perhaps more predictably. When selecting non-fiction they have a preference, like everyone else, for biographies and history, and those books on gardening, cookery, arts and education; they are less interested in science and engineering than the Confident Believers, the Technophiles and the Supporters.

### 5.4.32

Over half of this group (56 per cent) said that they read a magazine regularly. Reflecting the predominance of women in the cluster and the slightly higher-than-average household incomes, this group stand out in their readership of the women's monthly 'glossies', such as *Elle* and *Cosmopolitan*. Their readership of hobby magazines reflects their television-viewing and book-reading preferences.

### 5.4.33

Half of this group has access to a computer; one in five have access at work and 38 per cent have a computer at home (three-quarters of those with access). A third have access to the Internet, two-thirds from home and the rest from work or college. A quarter say that they use the Internet.

## Leisure interests

### 5.4.34

Given their interest in the arts and education, it is perhaps surprising that, in the previous 12 months, the Concerned are no more likely than average to have visited a museum, art gallery, zoo or planetarium or to have been to a theme park, the cinema, theatre, a concert or the opera, a historic house or garden. Of those who had visited a museum, science centre or art gallery in the 12 months before being interviewed, the Concerned were much less likely to have been somewhere focused on science or engineering. However, they are more likely to have attended a debate or meeting and to have visited the visitor centre at a tourist spot than all respondents taken together, but are less likely to have been to a sporting event.

### 5.4.35

The Concerned's interest in education, the environment and the arts is reflected in their increased likelihood to list watching television, listening to music and reading books among their leisure interests. There is evidence that this predominantly female group (60 per cent female) is home loving, interested in gardening, DIY and going walking, but are less keen, relative to other groups, on eating out.

### 5.4.36

Only 10 per cent of the total sample, and 10 per cent of the Concerned, had visited some sort of science activity or festival in the previous 12 months.

## Science information

### 5.4.37

Television news and documentaries dominate the ways in which respondents say that they receive information about science, and the Concerned are more likely to cite these sources than average. The national press is third in the rankings and the pattern is the same for all groups. Where the Concerned differ is in their use of local radio, where one in five (compared to 13 per cent of the total) offer this as a source of information.

### 5.4.38

This group is more likely than average to trust environmental and health campaigners, university scientists and investigative journalists to provide accurate information about scientific facts. The last of these is somewhat surprising, as nine out of ten of them agree that:

The media sensationalizes science.

### 5.4.39

Along with the Not Sure cluster, the Concerned cluster has the lowest proportion who trust Government scientists. When asked about whom they would least trust to provide accurate scientific information, their lack of trust in Government and politicians is again evident.

## Science communication

### 5.4.40

This group is the least satisfied with the amount of scientific information they receive. More than twice as many (11 per cent) as any other group, the next highest being 5 per cent, say:

These days I hear and see far too little information about science.

In all, 37 per cent, compared with an average of 24 per cent, want more, not less, information about science.

## Summary

### 5.4.41

The Concerned group is the smallest cluster (13 per cent of the total) and has the highest proportion of females (60 per cent are female). They have a realistic and positive attitude to life but are sceptical of those in authority. Their social grade, household income and education levels tend to mirror the population as a whole, but they tend to be home oriented. They are interested in a whole range of topical issues, and they know that science is an important part of life, especially for their children.



# Not Sure

## 5.5.1

This group's attitudes are explained by their demographics. They tend to live in households with relatively low incomes, be poorly educated, and in semi- or unskilled manual work or dependent on state benefits. They lack self-confidence and opinions on a whole range of topics and have a relative lack of appreciation of the benefits of science and technology. They differ from the Not for Me cluster, who are also uninterested in science, poorly educated and narrowly focused, as they are considerably younger and live with children.

## Demographics

### 5.5.2

The Not Sure cluster encompasses 17 per cent of all respondents and is the second most female group. Nearly half of this group are aged under 35, almost half have no qualifications and, apart from the Not for Me cluster, this group has by far the highest proportion with no science qualifications. Half are in social grades D and E (semi- and unskilled manual workers or wholly dependent on state benefits), and they have the lowest household incomes after the Not for Me group. They are more likely to have children in their household than any other cluster and more likely to be from minority ethnic groups – nearly one in ten are non-white, and 5 per cent are from the Indian Sub-continent (compared with 3 per cent of all respondents). Twelve per cent live in Scotland, compared with 9 per cent of all respondents.

## Attitude to life and current affairs

### 5.5.3

Reflecting their low educational achievement and low household income, the members of this cluster stand out for their professed lack of interest in the wider world, being least likely to express even moderate interest in the topics shown in Table 1 of Appendix 1 – except where it is likely to directly relate to their own circumstances. For topics which are likely to be of direct relevance to this, the poorest of groups, and the one most likely to have children, they are, what can best be described as, less

uninterested. These topics are music, new films and sport, education, welfare, economics and finance.

### 5.5.4

The Not Sure group is the least likely to be very interested in health issues, medical discoveries, environmental issues, science, economics, international current affairs or UK politics. Even the Not for Me cluster has a noticeably stronger interest in health and medical issues. A feature of this personal lack of engagement is a propensity to 'neither agree nor disagree' or to respond with 'don't know' to statements about attitudes to life.

### 5.5.5

The Not Sure is the second most likely group, after the Not for Me group, to disagree with statements such as:

I enjoy new situations and challenges

and

It is important for me to keep on learning new skills.

### 5.5.6

This cluster is the least likely to agree that:

Nothing is ever completely safe

and that:

Politicians need specialist help to regulate some areas.

**5.5.7**

This relative trust in the political system is at first glance surprising and appears to be reinforced by a belief that this cluster can influence Government. Leaving aside the very assured Confident Believers, the Not Sure group is least likely to agree with the statement:

What people like me think will make no difference to the Government.

However, the very high 'neither agree nor disagree' response indicates that only the Supporters and the Not for Me groups are less likely to actively disagree with this statement.

**5.5.8**

Taken together, this pattern of responses suggests that this, the most socially insecure of groups, is looking for stability, security and reassurance, not continual change, personal challenges and uncertainty in their surroundings.

## Leisure activities

**5.5.9**

Like the Not for Me group, this cluster is unlikely to visit cultural institutions such as art galleries, museums, information centres at tourist sites or science centres, with slightly over 10 per cent of them claiming to have visited an art gallery, museum or science centre within the last 12 months. The Not Sures are only half as likely as average to attend meetings, debates or talks on issues that they find of interest, with only the Not for Me group being less likely to take part in such activities. Even for less overtly cultural activities such as sporting events, the Not Sures are less likely than average to attend, with visiting the cinema being one of the few areas where participation by this cluster is close to the overall average. There is little desire in this group to go out more. Only theme parks were identified as places this group would like to visit but had not. This is probably because they are most likely to have children in their household. Lack of transport may also be a problem for the Not Sures as they are the least likely to have access to independent transport with 38 per cent having no access to a car, van or motorcycle.

**5.5.10**

The Not Sures are, along with the Not for Me group, the least likely group to take part in social activities such as going to pubs, clubs or restaurants. There is also below-average attendance at, or participation in, sporting events. It is likely that the lower-than-average income and education within this cluster plays an important role in its use of leisure time. The members of this cluster were less likely than average to have attended a science-based event or festival and were the group that were most likely to cite 'taking children' as the motivation for attendance when they did.

## Attitudes to science engineering and technology

**5.5.11**

The Not Sures are not well educated and financially resourced, and do not see the benefits of science or make the connection between scientific research and better living conditions. They are least likely to agree that:

Science and technology are making our lives healthier, easier and more comfortable

with only one-third agreeing compared to the national average of two-thirds. They are also least likely to agree that:

Even if it brings no immediate benefits scientific research which advances the frontiers of knowledge is necessary and should be supported by the Government.

**5.5.12**

They do not understand, or perceive the benefits of, science, and so are less likely than any group to be:

Amazed by the achievements of science

and the most likely to admit that:

I am not interested in science and don't see why I should be.

Seeing, or appreciating, little benefit from science, they are least likely to agree that:

Science is such a big part of our lives that we should take an interest,

that:

It is important to know about science in my daily life

and that:

The benefits of science are greater than any harmful effects.

#### 5.5.13

They are more likely to say that:

I don't understand the point of all the science being done today

and that they:

Are not clever enough to understand science and technology.

#### 5.5.14

In addition to their lack of understanding (and perhaps because of it), they also appear concerned about the control of science by society and the speed of change. They express above-average agreement with statements like:

Science is getting out of control and there is nothing we can do to stop it

and:

I cannot follow developments in science and technology because the speed of development is too fast.

#### 5.5.15

They are the least likely to agree that:

Businesses that invest in science deserve to make a profit on their investment.

The group next most likely to agree with this sentiment is the Concerned and even they are twice as likely to agree.

#### 5.5.16

Many Not Sures respond to attitude statements about science and engineering with either 'neither agree nor disagree' or 'don't know'. When added together, these two

categories usually make up about one third of the replies from the Not Sure group and can be as high as half of the responses. This is almost certainly a reflection of their lack of self-confidence resulting from a poor education.

#### 5.5.17

When considering individual branches of science and technology this cluster shows a lower-than-average interest in science across all disciplines, with almost the lowest level of reported interest across the 11 subjects tested (only the Not for Me group is less interested). There are only two subjects, transplants and medicines, where more than 50 per cent of the Not Sures profess an interest and, for these two subjects, the level of interest was still almost 15 per cent lower than average.

#### 5.5.18

This low level of interest is not surprising given the strong correlation between professed interest and perceived benefit, and this group does not appear to appreciate the benefits of science. So, as would be expected, it is not surprising to see the Not Sures being the least likely to describe any of the areas of science asked about being as beneficial or very beneficial. However, the high level of 'neither agree nor disagree' replies hides the fact that this group may not be the most likely to express a belief that a particular branch of science or engineering is not beneficial.

## Attitudes to scientists

#### 5.5.19

The lack of awareness about science extends to their views of scientists and engineers. The Not Sure group is the least likely to agree that:

Scientists and engineers make a valuable contribution to society

with only 44 per cent agreeing compared with the average of 84 per cent, probably out of ignorance of what they contribute. This is reflected in the high noncommittal percentage, but the active disagreement with this statement is more than three times the average of 3 per cent.

#### 5.5.20

The phrases this group uses most often to describe scientists are *intelligent*, *enquiring*, *methodical* and *secretive*. Phrases often used to describe engineers are *intelligent*, *male*, *responsible*, *logical* and *methodical*. It is worth noting that, when asked for spontaneous descriptions, this cluster, along with the Not for Me group, was the least likely to give a response (almost a third of respondents did not offer an answer). On the whole, this group appears to have a weak image of these professional groups.

**5.5.21**

This cluster is the least likely to describe science and engineering as good career choices – 51 per cent compared with an average of 74 per cent. Again there is a very high ‘don’t know’ level of 42 per cent, compared with the average of 22 per cent. This indicates that this cluster is isolated from a world where this is a potential life choice. The Not Sures tend to think that people take up science and engineering as careers because the work is well paid and interesting with good career opportunities.

## Media usage

**5.5.22**

The media usage of this group reflects their educational attainment levels and their lack of interest in the wider world, with this cluster being unlikely to read a broadsheet newspaper, either daily or on Sunday. The overall level of newspaper readership is close to the average but is dominated by the *Sun* and the *News of the World*. Importantly, they are least likely of all the clusters to believe that ‘the media sensationalizes science’.

**5.5.23**

This cluster watches more than the average amount of television, with one in ten viewing more than 42 hours per week, the same level as for the Not for Me group. The Not Sure’s viewing is dominated by ITV (50 per cent compared with the average of 34 per cent). Above-average types of viewing include films, soaps and chat shows, with over a quarter rating soaps as their favourite programmes.

**5.5.24**

The Not Sure group has an average level of radio listening, although one in five claim not to listen to the radio. For those who do, their listening is dominated by pop and rock chart music, probably reflecting the younger age profile of the cluster. However, local BBC stations find average usage among this group.

**5.5.25**

This cluster is one of the least likely to have recently read a book, and they are the least likely to have read any non-fiction. Their reading is dominated by fiction categories, with above-average readership of horror and romance stories.

**5.5.26**

The Not Sures are the second least likely cluster to read magazines on a regular basis and their reading is dominated by women’s weekly magazines, (read by a half compared with an average of a third). One in five read hobby magazines, and a quarter read television listings magazines.

**5.5.27**

The Not Sures are second only to the Not for Me group in lacking access either to a computer or the Internet. Over a third (37 per cent) have access to a computer, more at home than at work or college, and one in five have access to the Internet but only 15 per cent claim to use the Internet.

## Access to information about science, engineering and technology

**5.5.28**

The Not Sures are the most likely to believe that they hear too much about science and engineering (26 per cent compared with an average of 14 per cent). Yet they are not as aware of the various ways of accessing information about science as all respondents taken together. Half watch television documentaries, compared with an average of two-thirds, and a third gain information from national newspapers, compared with an average of half the population. Consistent with the belief that they already hear too much about science and engineering, this cluster does not highlight, to any marked degree, ways in which it would prefer to receive information.

**5.5.29**

This group show a lower degree of trust than average for almost all sources of information and is the least trusting of an eclectic range of sources of science information, including university scientists, health and environmental campaigning groups, scientists in industry, investigative journalists, Government advisory bodies and broadsheet newspapers. This is surprising given their apparent trust in Government and the political system. The one provider that they trust to a level approaching the average is television – both news and documentaries.

## Summary

**5.5.30**

The Not Sure group forms 17 per cent of the total sample. They tend to have the lowest household incomes, the lowest level of education, and fall into social grades D and E (unskilled manual workers and those wholly dependent on state benefits). Nine per cent are non-white. Their views on most topics tend to be unformed – they cannot be described as ‘anti-science’ but they are certainly not ‘pro-science’. This is largely because they tend not to appreciate the effects of science and engineering and are not likely to encounter scientists and engineers in their daily lives, which are constrained by low income and educational achievement.

# Not for Me

## 5.6.1

This is the second smallest cluster, forming 15 per cent of the total sample. Members of the Not for Me cluster are defined by their relatively old-age profile, lack of interest in science and other topical issues, and their low household incomes and educational level. They differ from the Not Sures in that they tend to appreciate the importance of science even though they have no personal interest in it. They share with the Concerned a feeling of alienation from the political system.

### Attitude to life

#### 5.6.2

The Not for Me group is nervous of change and feels powerless. They have considerably less interest in the world around them than the other clusters. Only just over a fifth agree that:

I enjoy new situations and challenges

and only 15 per cent (far less than in any other group) agree that:

It's important for me to keep on learning new skills.

Similarly, the Not for Me group is far more likely than any other (86 per cent) to agree that:

What people like me think will make no difference to the government.

(The next closest group is the Supporters, where 64 per cent agree.) A similar proportion (84 per cent) agree that:

People shouldn't tamper with nature.

### Attitude to science

#### 5.6.3

The Not for Me group is concerned that science is moving too fast for them to keep up. This cluster is one of the most likely to agree that:

I cannot follow developments in science and technology because the speed of development is too fast

and that:

Science and technology is too specialized for most people to understand it.

**5.6.4**

Only the Concerned are more likely to agree with each of these statements. Unlike the Concerned but like the Not Sures, however, the Not for Me group is more likely to agree that:

I am not clever enough to understand science and technology

although it should be noted that only 56 per cent express this sentiment.

Unlike the Concerned, they do not agree that:

It is important to know about science in my daily life.

Less than 30 per cent of the Not for Me and the Not Sure clusters agree with this statement.

**5.6.5**

The Not for Me group is more likely than average to agree that:

I am not interested in science and I don't see why I should be

but even so, only a third agree with this statement. However, they recognize the importance of science for the future and over nine out of ten agree that:

It is important that young people have a grasp of science and technology.

**5.6.6**

While two out of every five agree that:

I don't understand the point of all the science being done today

84 per cent agree that:

Britain needs to develop science and technology in order to enhance its international competitiveness

(placing this cluster on a par with the Confident Believers, Concerned and Supporters), and over 90 per cent agree that:

Scientists and engineers make a valuable contribution to society.

**5.6.7**

They share a scepticism of authority with the Concerned, but this is likely to stem from a feeling of alienation from power and the political process rather than from interest. After the Concerned they are the second most likely to agree that:

Science is driven by business, at the end of the day it is all about money

and that:

Scientists seem to be trying new things without stopping to think about the risks.

**5.6.8**

Unlike the Concerned, only half of the Not for Me cluster think that:

The media sensationalizes science.

Despite these sentiments, three-quarters still agree that:

I am amazed by the achievements of science.

### 5.6.9

Their interest in science is correlated with their rating of the benefits. From the list of scientific developments they tend to be interested in medical developments and climate change. The three areas which most of them cited as of interest – new medicines, heart and other transplants and climate change – are identical to the three developments they agree on being the most beneficial.

## Attitude to scientists

### 5.6.10

The Not for Me group tends to have a fairly unformed image of scientists and engineers, with a large proportion not offering any unprompted descriptions. When prompted with words to describe scientists, and separately to describe engineers, they are less likely than other groups to choose almost all the words on the list, but as with most groups the words most frequently cited are those assumed to be requirements for the job – such as *intelligent, logical* and, for engineers, *male*.

### 5.6.11

Six out of ten consider that a career in science or engineering is a good choice; only the Not Sures are less enthusiastic. This group, again with the Not Sures, are the least likely to give an opinion on why someone would choose to become a scientist.

## Demographics

### 5.6.12

Three-fifths of this cluster have no qualifications (far more than any other cluster) and over three-quarters have no science qualifications. This is explained by their age (half are 65 or over) and reflected in their social class – slightly more than a quarter are social class E (reliant on state benefits); otherwise they are more likely than average to be social grade C2 (skilled manual workers). Their income reflects their social grade and they live in the poorest households. As would be expected from their age, this group is the least likely to be living with children. This is also the group which is the most likely to be white and considerably more likely to be living in the north of Britain and the Midlands.

### 5.6.13

The Not for Me group are slightly more likely than average (11 per cent) to say that they are very religious, and fewer than average (22 per cent) say that they have no religion (a similar proportion to the Supporters). Nearly half claim to be Church of England, and almost all the rest are other Christian denominations.

## Media usage

### 5.6.14

More than twice the average spend over 42 hours per week watching television – as might be expected of an elderly, somewhat less affluent segment of the population. Their favourite programmes are soaps, and more of them watch soaps than in any other group. They are also more likely to watch quiz shows and religious programmes than any of the other clusters, and are less likely to watch sport, science and education programmes.

### 5.6.15

This group has the highest number of people (nearly a quarter) who do not listen to the radio, although an average number listen to the radio frequently. When they do listen, they tend to choose 'golden oldies' and local BBC talk stations.

### 5.6.16

The 70 per cent of this group who read a daily newspaper regularly are the least likely to read a broadsheet, choosing the *Mirror* in particular among the tabloids. On Sundays, the 65 per cent who read a paper regularly were the most likely to read a tabloid – notably the *People* and the *Sunday Express* – and the least likely to read a broadsheet.

### 5.6.17

The Not for Me group was less likely to have read a book in the previous 12 months than any other group. Those who had read a book were more likely than any other group to have read fiction and were most likely to have chosen romance or crime stories. Biographies, history, travel and gardening top their non-fiction reading list.

**5.6.18**

This group is the least likely to read magazines regularly. Of those who do, nearly half read a weekly woman's magazine. The television listings magazines are also relatively popular with this group, although only a quarter read them regularly.

**5.6.19**

Given the demographic profile of this group it is surprising that as many as a quarter have access to a computer, most of these have access at home. Nevertheless, this is the lowest proportion of any group. Half of those with access to a computer have access to the Internet, and only 8 per cent of the group use the Internet.

## Leisure interests

**5.6.20**

In general, the members of the Not for Me group have fewer leisure interests than any other group, perhaps reflecting their lack of interest in the world around them and the constraints imposed by low incomes. The only activity in which they are more interested than average is gardening, and it should be noted that their interest in crafts, sewing and knitting is much the same as that of other groups.

**5.6.21**

In the previous 12 months, the Not for Me group is less likely than all the other groups to have been to almost all of the places listed on the questionnaire. The list includes: visiting a science activity or festival, art galleries; zoos; lectures; talks; sporting events; the cinema; theatre; concerts or the opera. The most popular venues, with nearly one in three visiting, are country houses or gardens. Those who went to museums and galleries were unlikely to go anywhere that specialized in science, engineering or technology.

## Science information

**5.6.22**

As with the other groups, the information this group receives about science comes mainly through television news and documentaries and the national press. When asked about the ways they would most like to hear about science, these three top their list. However, they are less satisfied with receiving information about science through television documentaries and the national press than most other groups. In general, magazines and radio were not cited as preferred methods of communication.

## Science communication

**5.6.23**

Nearly three out of five of this group think that they receive about the right amount of information about science. The remainder is evenly split between those who feel that there is too much science information available and those who would prefer more.

## Summary

**5.6.24**

The Not for Me group forms 15 per cent of the total sample and mainly comprises those aged 65 years and over of social grade E, and slightly younger people of social grade C2. Like the Not Sure group, they are not particularly interested in political and topical issues or in science, believing that it is moving too fast for them to keep up. However, their lack of interest in science appears to mainly stem from their age, as they appear to appreciate its benefits for the future and its importance to young people.



# Summary of the Attributional Clusters

## The key differences between the groups

The Confident Believers tend to be supportive of science because they appreciate its benefits and have confidence in society and the political system to control scientific developments. They tend to be relatively up-market, well educated and to live in households with above-average household incomes.

The Technophiles also tend to be relatively up-market, well educated and to live in households with above-average incomes. They differ from the Confident Believers in being much less trusting of Government and the regulatory system, although they have more confidence in scientists and still have high levels of self-confidence. As a whole, this is the group with the highest level of qualifications in science and engineering.

The Supporters are also more likely than average to have qualifications in science and engineering, although not to such a high level as the Technophiles. They also tend to be very self-confident, but unlike the Technophiles, they are trusting of Government and others in authority. They tend to be younger than the Confident Believers and the Technophiles, but their social grade and sex profiles are very much in line with the average for Britain.

The Concerned also tend to have a social class profile similar to the average, however, this group is the most likely to be female. They tend to be concerned both about their ability to cope with the changes they perceive as being brought by science and technology, and about society's ability to cope with these developments. Their scepticism of authority is greater than any other group, including the Technophiles.

The Not Sure group tend to be poorly educated, under 35, living in households with below-average incomes and are more likely to be living with children than any other group. They stand out because they tend to neither agree nor disagree, or say that they do not know, in response to the attitudinal statements. They tend not to identify any benefits brought by science and technology.

The Not For Me group, by contrast, while also tending to be largely uninterested in science and technology tend to think that it is important. They also tend to be poorly educated and dependent on state benefits; unlike the Not Sures, however, they are much more likely to be aged over 65.

	Total sample	Confident Believers	Technophiles	Supporters	Concerned	Not Sure	Not for Me
Statement	Percentage agreeing						
The achievements of science are overrated	21	8	11	20	40	33	23
Because of science, engineering and technology there will be more opportunities for the next generation	77	91	93	82	53	58	77
Science and technology are making our lives healthier, easier and more comfortable	67	90	84	77	31	45	66
I am not interested in science and don't see why I should be	21	8	6	15	15	47	34
The speed of development in science and technology means that it cannot be properly controlled by Government	41	23	37	33	73	43	43
Politicians are too easily swayed by the media's reaction to scientific issues, they should take more of a lead	53	45	72	35	75	48	47
The more I know about science the more worried I am	32	13	20	29	66	33	39
Politicians support science for the good of the country	43	60	37	63	22	29	43
Scientists seem to be trying new things without stopping to think about the risks	56	59	34	49	89	53	68
Rules will not stop researchers doing what they want behind closed doors	69	83	46	63	91	59	84
I don't understand the point of all the science being done today	29	15	10	27	33	52	40
Science is getting out of control and there is nothing we can do to stop it	35	12	26	32	60	45	43
Social grade AB	16	25	23	16	16	7	10
Social grade E	15	7	7	14	16	26	26
Aged under 35	34	32	37	41	32	46	14
Aged over 65	19	14	14	10	17	16	48
Female	51	50	45	47	59	57	54
Non-white	6	6	5	9	5	9	2
Black	2	1	1	3	1	1	1
Indian Sub-continent	3	3	2	3	3	5	1
Household income < £10 000	24	14	16	23	27	29	35
Household income > £25 000	16	29	21	14	19	10	8
Postgraduate or professional qualifications in science	3	2	7	4	2	2	2

Full tables can be found in Appendix 1.

# Conclusions

## 6.1

Science communication activities have always recognized that there is more than one 'public', dividing audiences into different ages and socioeconomic groups. This research shows that attitudes to life influence attitudes to science, which may be helpful in bringing science communication messages to as wide an audience as possible. The OST and the Wellcome Trust intend that this report opens a short period of consultation within the science communication community to discuss the implications of this work.

### 6.2

The mapping research has shown that the UK has an active and diverse science communication community encompassing scientists, Government, industry and the media. Most activity is based around day trips or evening talks, generating media coverage and, increasingly, providing information on the Internet. For many, however, the targeting, marketing and evaluation of activities tends to be simplistic and under-funded. There continues to be an emphasis on events and activities that interest the provider, and few events are designed with the aim of actively engaging and broadening the audience. Success tends to be measured by numbers attending and quality of the experience, rather than by the impact or effect of the activity, especially in the long term.

### 6.3

The public attitude to science research has shown that basic personal attitudes are the primary factor that determine an individual's attitude to science and engineering. These basic attitudes can be categorized into six clusters. The nature of these clusters dictates the 'tone of voice' that can best be used to speak to these groups.

Message content need not, indeed should not, be varied, but the existence of group differences should allow efforts to be focused where needed or desired.

### 6.4

Further analysis of the clusters also reveals significant patterns in their sociodemographics, media usage and leisure interests. This information can be used to determine the most appropriate media to use to reach different attitudinal clusters. 'Hooks' can be identified that will attract people to take a more active interest in science and scientific issues.

### 6.5

It is important to reach as wide a proportion of the general public as possible. Individual organizations may wish to target their activities at a particular grouping as identified here, but it is important that there should be collaboration between organizations to ensure that there is satisfactory overall coverage.

### 6.6

At the national level, a clear finding is the lack of a framework within which people can access information about new science, allowing them to assess and judge information and its implications. The respondents were unsure of how this might happen and it remains a challenge to science communicators and others. Perhaps a start might be made by organizations with different perspectives creating a public dialogue through coordination of activities. So, while some organizations may not be able to join forces, because they have different objectives, dialogue between the organizations and sectors might begin to provide a framework for a national debate.

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# Appendix 1

## Tables

The responses to attitude statements, media usage and demographics of the clusters and overall population

All values, except unweighted base, are percentages.

A dash indicates 0 per cent; an asterisk indicates 0.01–0.5 per cent

**Table 1** (Q1) Degree of interest in issues – all very/moderately interested

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Health issues	91	94	97	85	92	93	85
Medical discoveries	87	91	93	78	90	91	76
Music	84	88	88	83	87	87	69
Environmental issues	82	88	88	68	88	88	73
Education	78	84	86	75	83	89	51
Welfare and social exclusion: for example, drugs and poverty	78	83	81	73	85	82	59
New inventions and technologies	73	83	80	53	83	86	53
New scientific discoveries	71	80	75	47	87	79	55
New films	67	71	68	70	68	77	45
Science issues	62	71	73	34	77	74	43
International current affairs	61	72	68	42	69	61	53
Sport	60	66	60	57	66	62	47
Economics and finance	59	69	69	45	69	63	36
UK politics	54	70	63	31	59	58	44
Energy/nuclear power issues	47	54	53	32	61	52	29
Summary – issues related to science	94	95	98	88	98	97	87
Unweighted base	1839	293	239	362	336	342	266

**Table 2** (Q2) Which TV programmes enjoy watching

Answers	Total	Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Films	68	70	71	72	66	73	59
Comedy	59	58	61	58	58	65	56
Documentaries	57	65	65	40	66	60	48
Wildlife	57	55	66	47	59	56	61
News	57	59	63	42	59	60	59
Drama	56	63	62	45	56	55	56
Soaps	53	51	50	60	45	53	62
Sport	44	49	44	38	46	46	38
Music shows	38	36	38	39	41	44	27
Quiz shows/panel games	36	32	38	36	27	38	45
Chat shows	30	25	30	32	24	36	33
Hobbies/leisure	30	35	32	15	33	35	27
Science	25	33	26	10	36	27	14
Variety/family shows	24	16	28	25	15	32	30
Fly-on-the-wall programme	24	30	25	18	19	29	22
Education	21	23	26	14	25	23	12
Arts programmes	15	15	22	9	18	15	13
Children's	15	13	18	16	16	16	8
Religious	10	11	8	7	8	11	16
History	*	–	–	1	*	1	–
Other	1	1	2	*	1	*	1
None	1	*	*	*	1	*	*
Unweighted base	1839	293	239	362	336	342	266

**Table 3** (Q4a) Hours a week spent watching television

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Under 7 hours	8	6	5	9	10	10	4
7–14 hours	26	25	27	23	36	27	17
15–21 hours	26	30	30	20	26	28	24
22–28 hours	17	20	15	20	13	18	18
29–35 hours	9	8	16	8	6	6	10
36–42 hours	6	5	4	6	5	4	13
More than 42 hours	6	3	2	11	3	5	12
None	1	1	*	*	1	1	*
Don't know	1	*	1	2	*	1	3
Unweighted base	1839	293	239	362	336	342	266

**Table 4** (Q4b) TV channel watched most often

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
BBC1	30	34	33	20	35	28	26
BBC2	6	8	10	3	7	3	7
ITV	34	27	35	50	24	34	36
C4 or S4C	4	4	3	3	5	5	3
C5	2	1	2	2	2	1	2
Cable	5	6	3	3	5	9	4
Satellite	9	10	6	9	11	9	8
Don't know	10	9	8	9	11	10	15
Not stated	*	1	*	*	*	*	–
Unweighted base	1797	290	232	352	331	336	255



**Table 5** (Q5a) Hours a week spent listening to the radio

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Under 3 hours	16	16	14	17	15	19	13
3–6 hours	18	19	15	17	22	19	18
7–14 hours	19	24	19	16	20	19	19
15–21 hours	11	13	16	12	10	9	7
22–28 hours	6	8	6	5	8	5	6
29–35 hours	3	3	4	2	3	5	5
35+ hours	9	9	11	9	8	10	9
None	15	9	14	20	13	14	23
Don't know	1	*	1	2	2	1	1
Unweighted base	1839	293	239	362	336	342	266

**Table 6** (Q6a) Daily newspapers read regularly (3 out of 4 issues)

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
<i>Daily Express</i>	5	6	6	3	4	6	8
<i>Daily Mail</i>	15	14	19	11	18	12	15
<i>Mirror</i>	14	12	10	15	13	18	18
<i>Daily Record</i>	4	4	3	6	3	5	4
<i>Daily Telegraph</i>	4	9	5	2	4	4	3
<i>The Financial Times</i>	1	1	1	2	1	2	–
<i>Guardian</i>	2	2	4	1	4	1	1
<i>Independent</i>	1	1	2	1	2	2	*
<i>Daily Star</i>	3	2	2	2	3	4	4
<i>Sun</i>	20	16	20	32	13	23	17
<i>The Times</i>	3	8	3	1	4	4	*
Other	8	7	6	8	5	8	12
None	33	34	34	34	40	27	30
Any broadsheet	11	19	13	6	14	10	4
Any tabloid	52	45	54	57	46	58	56
Don't know	*	1	–	–	–	–	–
Not stated	*	*	–	–	–	–	–
Unweighted base	1839	293	239	362	336	342	266

**Table 7** Q6b Sunday papers read regularly (3 out of 4 issues)

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
<i>Independent on Sunday</i>	1	2	1	1	2	1	-
<i>Mail on Sunday</i>	13	13	16	8	15	12	12
<i>News of the World</i>	20	17	22	26	16	23	20
<i>Observer</i>	2	1	3	*	4	1	*
<i>Sunday People</i>	6	5	7	5	4	8	8
<i>Sunday Express</i>	4	3	8	2	3	3	8
<i>Sunday Mirror</i>	9	11	11	9	5	10	10
<i>Sunday Sport</i>	1	1	*	*	1	-	*
<i>Sunday Telegraph</i>	4	8	4	2	4	4	3
<i>Sunday Times</i>	6	10	6	3	10	5	1
<i>Sunday Post</i>	3	2	3	4	1	2	5
<i>Sunday Mail</i>	5	7	4	8	3	6	5
Any other Sunday newspaper	2	2	3	2	1	1	3
Any broadsheet	12	21	13	5	18	11	4
Any tabloid	49	45	53	52	40	51	58
None	38	34	37	39	44	37	35
Don't know	1	*	-	2	*	1	*
Not stated	1	1	-	1	*	1	1
Unweighted base	1839	293	239	362	336	342	266

**Table 8** (Q7) Whether any books read recently

	Total	Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
<b>Answers</b>		<b>Clusters</b>					
Yes	61	72	68	47	73	58	45
No	39	28	32	53	27	42	55
Unweighted base	1839	293	239	362	336	342	266

**Table 9** (Q9) Whether read magazines regularly (3 out of 4 issues)

	Total	Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
<b>Answers</b>		<b>Clusters</b>					
Yes	49	58	56	43	52	50	36
No	51	42	44	57	48	50	64
Unweighted base	1839	293	239	362	336	342	266

**Table 10** (Q10) Whether have access to computer

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Yes – at home	39	50	38	27	56	39	20
Yes – at work	19	27	19	13	25	19	7
Yes – at college	7	9	9	6	7	9	*
Yes – via the library	2	3	2	1	2	2	–
Yes – via friends	2	1	2	2	3	1	*
Yes – via Internet cafés	*	1	*	–	*	1	–
Any access	49	62	49	37	64	52	23
No	51	38	51	63	35	48	76
Not stated	*	–	–	–	1	–	1
Unweighted base	1839	293	239	362	336	342	266

**Table 11** (Q11b) Whether have access to Internet

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Yes – at home	24	31	23	12	39	23	11
Yes – at work	11	16	10	6	16	12	4
Yes – at college	6	8	7	5	5	9	*
Yes – via the library	1	2	1	–	1	2	–
Yes – via friends	1	1	2	1	2	*	*
Yes – via Internet cafés	*	1	*	*	–	*	–
Any access	33	44	34	20	47	36	12
No	67	56	66	80	53	64	88
Don't know	*	–	*	–	*	*	–
Unweighted base	1839	293	239	362	336	342	266

**Table 12** (Q11c) Whether use Internet

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Yes	24	30	25	15	38	25	8
No	76	70	75	85	62	75	92
Don't know	*	–	–	–	–	1	–
Unweighted base	1839	293	239	362	336	342	266

**Table 13** (Q11) Agreement with statements – all agreeing

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
You have to trust experienced people to make decisions	62	69	52	54	57	68	68
What people like me think will make no difference to the Government	54	18	58	47	55	64	86
Politicians need specialist help to regulate some areas	81	91	94	59	83	90	72
People shouldn't tamper with nature	72	51	83	72	55	91	84
I enjoy new situations and challenges	71	89	83	56	86	89	22
It is important for me to keep on learning new skills	72	87	86	60	87	94	15
Nothing is ever completely safe	82	82	94	68	81	95	76
Unweighted base	1839	293	239	362	336	342	266

**Table 14** (Q14) Activities take part in spare time

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Playing sport/exercising	31	33	33	25	45	34	13
Watching sport	38	44	40	32	44	36	29
Watching TV	80	85	86	78	75	78	77
Listening to music	61	68	71	53	66	59	47
Reading books	49	56	63	37	56	44	37
Shopping	51	58	55	50	53	47	42
Going to pubs/clubs	40	47	42	36	45	40	28
Eating out	51	65	46	43	58	50	39
Charities/voluntary work	13	16	16	6	15	13	10
Walking	39	39	48	33	45	39	28
DIY	27	30	32	17	36	28	22
Gardening	37	42	41	27	34	36	42
Theatre/cinema	35	44	35	27	48	34	19
Sewing, knitting and crafts	19	21	23	15	17	16	20
Collecting things (e.g. stamps)	9	10	11	4	15	7	9
Go to church or another place of worship	15	17	14	12	14	18	15
Computing	1	1	–	*	2	*	1
Socializing	*	*	–	*	*	1	–
Quizzes and puzzles	*	–	*	*	1	*	*
Pets	*	–	–	–	–	1	1
Bingo	*	–	1	–	*	*	–
Fishing	*	–	*	–	*	1	–
Other	2	3	2	1	1	4	2
Nothing	*	*	–	1	–	*	*
Don't know	*	–	–	*	–	–	–
Not stated	*	–	–	–	*	1	*
Unweighted base	1839	293	239	362	336	342	266

**Table 15** (Q19a) Agreement with statements – all agreeing

	Total	Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Answers	Clusters						
The achievements of science are over-rated	21	8	40	33	11	20	23
Because of science, engineering and technology there will be more opportunities for the next generation	77	91	53	58	93	82	77
Science and technology are making our lives healthier, easier and more comfortable	67	90	31	45	84	77	66
The benefits of science are greater than any harmful effects	43	68	15	28	49	53	34
Science makes our lives change too fast	44	24	68	48	36	47	48
The more I know about science the more worried I am	32	13	66	33	20	29	39
I cannot follow developments in science and technology because the speed of development is too fast	42	28	55	52	35	35	53
Science and technology is too specialized for most people to understand it	66	61	77	64	66	57	71
Science is getting out of control and there is nothing we can do to stop it	35	12	60	45	26	32	43
The speed of development in science and technology means that it cannot be properly controlled by Government	41	23	73	43	37	33	43
Politicians are too easily swayed by the media's reaction to scientific issues; they should take more of a lead	53	45	75	48	72	35	47
Scientists should listen more to what ordinary people think	69	62	85	66	65	73	67
In general scientists want to make life better for the average person	67	81	37	46	81	81	70
The media sensationalizes science	64	64	91	48	82	47	51
Science is driven by business; at the end of the day it is all about money	61	43	78	56	62	59	70
It is important to know about science in my daily life	59	64	64	27	82	82	28
It is important that young people have a grasp of science and technology	91	97	96	66	99	98	92
Unweighted base	1839	293	239	362	336	342	266



**Table 16** (Q19b) Interest in scientific and technical issues – all very/quite interested

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Genetic testing	43	47	44	30	62	46	25
Human fertility testing	39	46	41	28	50	45	21
Space research and astronomy	46	55	47	27	57	57	31
New and faster methods of transport	55	58	50	42	66	64	43
Heart and other transplants	75	78	81	62	79	80	69
Computing and the Internet	52	62	43	38	66	65	32
Cloning	23	21	27	17	37	23	8
Telecommunications	60	62	59	47	71	71	48
New methods of food production and manufacture	49	52	48	40	56	53	41
New medicines	84	87	89	70	88	87	82
Research into climate changes	59	61	72	38	69	67	50
Unweighted base	1839	293	239	362	336	342	266

**Table 17** (Q19c) How beneficial development to humanity – all very/quite beneficial

	Total	Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
<b>Answers</b>		<b>Clusters</b>					
Genetic testing	41	60	32	27	52	41	28
Human fertility testing	65	79	60	52	75	70	52
Space research and astronomy	56	70	55	35	63	66	47
New and faster methods of transport	66	78	52	56	72	73	61
Heart and other transplants	91	97	91	83	94	93	88
Computing and the Internet	73	86	71	51	86	81	61
Cloning	19	25	15	14	26	18	12
Telecommunications	81	89	77	63	90	84	79
New methods of food production and manufacture	63	79	50	54	71	62	58
New medicines	94	100	96	84	97	96	92
Research into climate changes	72	78	78	54	81	76	61
Unweighted base	1839	293	239	362	336	342	266

**Table 18** (Q22) Level to which respondent agrees with statements – all agreeing

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
We depend too much on science and not enough on faith	38	29	54	47	23	48	33
Scientists and engineers make a valuable contribution to society	84	99	81	44	99	89	91
Britain needs to develop science and technology in order to enhance its international competitiveness	79	88	83	41	93	85	84
I don't understand the point of all the science being done today	29	15	33	52	10	27	40
Finding out about new scientific developments is easy these days	36	39	24	25	40	60	23
There is so much conflicting information about science it is difficult to know what to do	57	57	77	55	51	43	66
I am not clever enough to understand science and technology	38	32	32	57	19	35	56
Politicians support science for the good of the country	43	60	22	29	37	63	43
Scientists seem to be trying new things without stopping to think about the risks	56	59	89	53	34	49	68
Rules will not stop researchers doing what they want behind closed doors	69	83	91	59	46	63	84
It is important to have some scientists who are not linked to business	78	97	93	46	80	78	79
Businesses that invest in science deserve to make a profit on their investments	58	75	57	28	60	66	62
Science is such a big part of our lives that we should take an interest	73	87	82	30	87	91	63
I am not interested in science and I don't see why I should be	21	8	15	47	6	15	34
Even if it brings no immediate benefits scientific research which advances the frontiers of knowledge is necessary and should be supported by the Government	72	87	78	28	83	82	73
I am amazed by the achievements of science	75	90	73	32	86	91	75
Unweighted base	1839	293	239	362	336	342	266

**Table 19** (Q23a) Sources trusted to provide accurate information about scientific facts

	Total	Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Answers	Clusters						
Scientists in universities	48	64	51	25	57	48	39
Scientists working for charities (e.g. Imperial Cancer Research Fund)	45	53	47	28	51	44	45
TV documentaries	41	44	38	37	42	50	33
Health campaigning groups (e.g. Alzheimer's Society)	35	43	41	18	38	35	34
TV news and current affairs programmes	33	40	31	27	36	36	29
Science books	31	40	31	19	40	33	20
Environmental campaigning groups (e.g. Friends of the Earth/Greenpeace)	30	30	36	20	33	32	29
Well-known scientists	28	35	25	18	35	29	23
People working for the popular scientific press (e.g. <i>New Scientist</i> )	26	38	34	11	30	25	17
Scientists working for industry	21	27	19	14	24	25	18
Government scientists	20	26	11	11	25	30	16
Investigative journalists	15	22	25	7	16	13	11
Government advisory bodies	13	14	13	6	16	15	12
People working for broadsheet newspapers	10	18	10	3	11	9	8
People working for tabloid newspapers	4	5	4	3	2	7	5
Government ministers/politicians	4	4	3	3	6	5	1
Other	5	2	4	11	4	3	8
None	5	2	4	11	4	3	8
Don't know	5	1	2	10	1	4	11
Not stated	*	–	–	1	–	–	–
Unweighted base	1839	293	239	362	336	342	266

**Table 20** (Q23b) Most trusted source to provide accurate information about scientific facts

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Scientists in universities	18	32	16	9	20	16	16
Scientists working for charities (e.g. Imperial Cancer Research Fund)	13	14	13	12	10	14	12
TV documentaries	10	8	11	15	8	9	10
Well-known scientists	7	6	4	6	8	9	9
Environmental campaigning groups (e.g. Friends of the Earth/Greenpeace)	6	5	9	4	6	7	7
Science books	6	5	4	4	11	4	5
TV news and current affairs programmes	6	6	4	9	4	6	7
Health campaigning groups (e.g. Alzheimer's Society)	4	2	10	3	4	3	3
People working for the popular scientific press (e.g. <i>New Scientist</i> )	4	4	6	2	6	4	2
Government scientists	3	2	*	2	5	6	3
Investigative journalists	3	4	6	1	4	3	2
Scientists working for industry	2	1	4	2	1	2	2
Government advisory bodies	1	1	1	*	1	2	1
People working for broadsheet newspapers	1	1	1	–	1	1	1
Government ministers/politicians	*	*	–	1	–	–	–
People working for tabloid newspapers	*	–	–	*	–	–	–
Other	*	–	*	*	1	1	1
None	6	3	7	11	4	6	7
Don't know	8	4	4	13	5	7	14
Not stated	1	1	*	4	*	*	1
Unweighted base	1839	293	239	362	336	342	266

**Table 21** (Q23c) Least trusted source for accurate information about scientific facts

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
People working for tabloid newspapers	35	48	28	25	43	38	27
Government ministers/politicians	13	9	22	9	14	8	16
Government scientists	8	8	10	8	6	9	7
People working for broadsheet newspapers	4	5	3	3	6	3	4
Government advisory bodies	4	3	6	2	3	3	5
Investigative journalists	4	4	1	2	5	5	3
Scientists working for industry	3	4	5	3	1	3	1
TV documentaries	2	2	1	3	1	3	2
Environmental campaigning groups (e.g. Friends of the Earth/Greenpeace)	2	1	3	1	1	1	3
TV news and current affairs programmes	2	–	3	2	2	1	2
People working for the popular scientific press (e.g. <i>New Scientist</i> )	1	2	*	2	1	2	1
Science books	1	1	1	*	1	*	1
Well-known scientists	1	1	*	1	*	1	–
Scientists working for charities (e.g. Imperial Cancer Research Fund)	*	–	1	1	–	*	*
Scientists in universities	*	–	–	1	1	*	–
Health campaigning groups (e.g. Alzheimer's Society)	*	1	–	–	–	*	–
Other	*	*	*	1	*	–	–
None	6	2	5	14	3	6	9
Don't know	12	7	6	19	9	13	18
Not stated	3	2	3	3	2	6	1
Unweighted base	1839	293	239	362	336	342	266

**Table 22** (Q25) Whether career in science/engineering considered to be a good choice

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Yes	74	85	76	51	81	85	60
No	4	2	6	6	4	2	4
Don't know	22	13	16	42	14	13	35
Not stated	*	–	1	1	*	–	–
Unweighted base	1839	293	239	362	336	342	266

**Table 23** (Q28) Statement respondent agrees most with regarding science communication

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
These days I hear and see far too much information about science	3	1	3	5	2	4	5
These days I hear and see too much information about science	11	7	14	21	6	12	8
These days I hear and see about the right amount of information on science	55	67	41	48	58	54	58
These days I hear and see too little information about science	20	21	26	9	27	22	13
These days I hear and see far too little information about science	4	2	11	2	4	5	1
None	*	–	–	–	*	–	–
Don't know	7	2	5	14	3	2	14
Not stated	*	–	1	1	–	1	–
Unweighted base	1839	293	239	362	336	342	266

**Table 24** (Q29) Ways respondent receives information about science

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Audio tapes	1	*	1	1	1	1	–
Billboards/hoardings	2	3	4	1	3	4	*
Information in Braille for blind people	*	1	–	*	*	*	1
Children	8	9	10	5	9	10	4
Information in languages apart from English	1	1	1	1	1	2	–
The Internet/website	13	17	15	7	21	13	2
Leaflets	12	15	10	7	18	15	6
Magazines	25	38	24	10	38	25	12
Newspapers – local	14	12	16	14	14	17	15
Newspapers – national	51	61	55	33	55	57	44
Products – e.g. food	6	10	9	2	11	5	1
Radio – local	13	16	19	10	14	12	9
Radio – national	27	37	28	16	36	24	18
Telephone information line	1	1	1	1	1	1	1
Teletext	8	13	10	4	8	7	5
Television news	70	72	75	60	75	76	64
Television programmes, e.g. documentaries	68	81	74	50	79	69	55
Videos	4	5	6	5	4	5	2
Information from Government	13	20	12	6	18	14	6
Noticeboards	4	5	6	1	4	4	2
Other	3	3	5	*	5	4	2
None	5	*	3	13	3	1	9
Don't know	3	1	2	7	1	2	6
Not stated	*	*	–	1	–	*	*
Unweighted base	1839	293	239	362	336	342	266



**Table 25** (Q30/31) Ways respondent would like to receive information about science

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Audio tapes	1	1	2	2	2	*	*
Billboards/hoardings	4	7	4	2	4	7	1
Information in Braille for blind people	1	1	2	1	2	1	1
Children	5	6	6	3	6	7	3
Information in languages apart from English	1	2	*	1	2	1	*
The Internet/website	17	27	15	7	30	16	6
Leaflets	14	18	10	9	15	20	8
Magazines	20	27	17	8	31	25	10
Newspapers – local	11	10	11	10	8	17	11
Newspapers – national	36	46	40	23	36	40	32
Products – e.g. food	5	7	5	3	6	5	2
Radio – local	10	12	10	6	10	15	5
Radio – national	20	31	19	13	20	22	13
Telephone information line	2	2	2	1	2	1	1
Teletext	6	9	7	3	8	7	4
Television news	56	58	55	48	58	61	52
Television programmes, e.g. documentaries	57	72	56	38	65	63	47
Videos	5	4	8	3	6	7	1
Information from Government	13	18	11	6	14	21	6
Noticeboards	3	7	3	1	2	5	2
Unweighted base	1839	293	239	362	336	342	266

**Table 26** (Q32) Where respondent currently receives information about science

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Council offices	3	5	3	3	3	2	2
Through the door/by mail	16	21	16	11	16	17	12
GP surgeries	23	26	24	14	27	28	14
Hospitals	15	19	16	11	19	20	7
In libraries	28	33	31	17	38	32	14
In restaurants	1	1	1	1	1	1	–
Schools/colleges	20	24	20	15	26	27	4
In shops	5	8	5	2	5	8	3
At work	15	23	12	8	20	20	2
Nowhere	32	25	36	41	26	19	46
Other	6	7	7	2	8	5	6
Don't know	5	*	1	13	2	5	11
Not stated	*	*	*	1	*	*	–
Unweighted base	1839	293	239	362	336	342	266

**Table 27** (Q34) Additional places respondent would like to receive information on science from

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Council offices	4	3	6	2	7	5	2
Through the door/by mail	10	10	14	6	8	21	4
GP surgeries	7	8	9	5	5	7	5
Hospitals	5	6	6	3	3	7	4
In libraries	8	8	9	4	10	9	6
In restaurants	1	*	*	1	2	2	1
Schools/colleges	3	5	4	3	3	1	3
In shops	3	3	3	1	4	3	2
At work	2	2	3	*	3	3	1
Nowhere	41	47	40	42	39	36	40
Other	3	3	3	2	5	2	3
Don't know	25	19	19	32	25	23	33
Not stated	3	3	3	3	5	3	4
Unweighted base	1839	293	239	362	336	342	266

**Table 28** C2: Age

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
16–24	14	15	10	20	17	18	2
25–34	20	17	22	26	20	23	12
35–44	17	18	15	15	22	19	13
45–54	17	21	19	14	17	19	11
55–59	6	5	8	6	5	4	8
60–64	6	10	8	3	6	6	6
65+	19	14	17	16	14	10	48
Unweighted base	1839	293	239	362	336	342	266

**Table 29** C3: Social grade

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
AB	16	25	16	7	23	16	10
C1	30	36	32	22	36	31	22
C2	23	19	25	23	23	23	26
D	15	12	11	23	11	16	16
E	15	7	16	26	7	14	26
Unweighted base	1839	293	239	362	336	342	266

**Table 30** C4: Highest level of qualifications obtained on leaving full time education

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
GCSEs/CSEs/O levels/BTEC (first diploma) or equivalent/NVQ/SVQ level 1 or 2	34	41	31	31	37	40	26
A Levels/Scottish Highers/BTEC (higher) or equivalent/NVQ/SVQ level 3/HNC	10	10	14	8	12	11	8
First degree or equivalent/NVQ/SVQ level 4/HND	8	12	8	3	13	7	2
Postgraduate degree	3	6	2	1	5	1	1
Professional qualification/chartered professional/NVQ/SVQ level 5	4	4	5	3	7	2	4
PhD	*	*	–	–	2	–	–
Still studying	5	6	7	5	5	8	*
None of the above	34	21	33	48	19	30	60
Don't know	*	*	–	1	*	*	*
Not stated	*	–	1	1	1	*	–
Unweighted base	1839	293	239	362	336	342	266

**Table 31** C5 Highest level of qualifications obtained in science

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
GCSEs/CSEs/O levels/BTEC (first diploma) or equivalent/NVQ/SVQ level 1 or 2	26	33	24	21	29	31	16
A Levels/Scottish Highers/BTEC (higher) or equivalent/NVQ/SVQ level 3/HNC	6	9	9	3	10	5	2
First degree or equivalent/ NVQ/SVQ level 4/HND	4	5	6	–	7	4	1
Postgraduate degree	1	1	*	1	3	1	–
Professional qualification/chartered professional/NVQ/SVQ level 5	2	1	2	1	3	3	2
PhD	*	–	*	–	1	–	–
Still studying	2	3	1	3	4	3	–
None of the above	56	49	56	68	42	51	77
Don't know	1	1	1	1	1	1	*
Not stated	1	*	1	3	1	1	2
Unweighted base	1839	293	239	362	336	342	266

**Table 32** Summary of children in household

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Any children in household	34	32	33	41	37	37	21
No children in household	65	68	66	57	61	61	78
Unweighted base	1839	293	239	362	336	342	266

**Table 33** C7: Ethnic group

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
White	94	94	95	91	95	91	97
Black – Caribbean	1	*	1	*	1	1	1
Black – African	1	1	1	1	*	1	*
Black – Other	*	*	*	*	*	*	*
Indian	1	1	1	2	*	1	1
Pakistani	2	2	2	2	1	2	1
Bangladeshi	*	*	*	1	*	*	–
Chinese	*	–	*	*	–	*	–
Mixed race	1	1	*	1	*	1	*
Other	1	1	*	2	1	1	–
All black	2	1	1	1	1	3	1
Indian/Pakistani/Bangladeshi	3	3	3	5	2	3	1
Chinese/mixed race/other	1	1	1	3	1	2	*
Unweighted base	1839	293	239	362	336	342	266

**Table 34** C8: Religion respondent belongs to

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
No religion	27	28	28	28	34	21	22
Christian – no denominations	6	7	7	6	6	7	4
Roman Catholic	13	11	11	15	12	15	11
Church of England/Anglican	36	38	34	28	34	37	47
Baptist	1	1	–	2	1	1	3
Methodist	3	3	3	4	1	3	5
Presbyterian/Church of Scotland	3	4	4	3	2	3	3
Free Presbyterian	*	–	1	–	–	*	–
Brethren	*	–	–	*	*	–	–
United Reform Church (URC)/ Congregational	*	–	1	–	–	*	–
Other Protestant	1	1	1	1	1	–	*
Other Christian	2	1	2	2	2	4	*
Hindu	1	1	*	1	*	*	*
Jewish	*	–	*	*	–	1	–
Muslim/Islam	3	3	2	6	2	3	1
Sikh	*	*	1	*	*	*	–
Buddhist	*	–	–	–	–	–	*
Other non-Christian	1	*	1	*	2	*	*
Refused/not willing to say	3	1	2	3	3	4	3
Summary – all Christian	65	65	65	61	59	70	73
Don't know	*	–	–	–	*	–	–
Not stated	*	1	*	1	–	–	*
Unweighted base	1839	293	239	362	336	342	266



**Table 35** C9: Level of religiousness

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Very religious	8	7	4	12	7	8	11
Somewhat religious	26	29	34	23	22	28	25
Neither religious nor nonreligious	26	24	24	28	25	24	28
Somewhat nonreligious	19	21	21	14	23	17	19
Very nonreligious	18	18	15	17	19	22	16
Summary – religious	35	36	38	34	29	36	36
Don't know	2	1	2	4	3	1	*
Not stated	1	–	–	2	1	–	–
Unweighted base	1839	293	239	362	336	342	266

**Table 36** Total household income (per annum)

Answers	Total	Clusters					
		Confident Believers	Concerned	Not Sure	Technophiles	Supporters	Not for Me
Under £3000	2	*	2	4	*	4	2
£3000–£5999	12	8	15	14	7	10	21
£6000–£9999	10	6	10	11	9	9	12
£10 000–£14 999	10	10	9	9	10	10	10
£15 000–£24 999	13	15	16	13	12	14	11
£25 000–£34 999	8	15	7	5	8	8	6
£35 000–£44 999	4	6	4	2	8	4	1
£45 000–£54 999	2	5	2	*	3	1	1
£55 000+	2	3	6	3	2	2	–
Refused/Don't know	36	32	29	38	39	39	37
Not stated	1	–	*	1	1	–	–
Unweighted base	1839	293	239	362	336	342	266

# Appendix 2

## Qualitative Research

### Topic Guide

Order of introducing topics –  
science, engineering and technology groups

#### 1. Introduction and warm-up

Moderator to ask the group to introduce themselves, and tell the rest of the group a little bit about themselves (briefly)

- do they work, what do they do?
- do they have children, how old are they?
- what kinds of things do they enjoy in their spare time (hobbies)?

#### 2. Brainstorming science, engineering and technology

Moderator then to write 'science' on the flipchart - what immediately comes to mind?

Key words and phrases written on 'post-its', stuck temporarily to the board and fully probed. ('Don't think too deeply, just from the top of your mind, what comes to mind when I say "science" to you?')

(List generated first, then full probing.)

- each key word and phrase clarified – 'what does that mean to you?'
- and given what it is, 'how do you feel about that?'
- then discussed amongst the rest of the group ('how about the rest of you?')
- then explored in terms of its meaning/importance for their lives ('what difference does that make for you?', and 'what does that mean in terms of your day-to-day living?')
- examples of instances illustrating this probed
- then explored in terms of its connection with other key words and phrases ('how does that relate to what you were saying about x?')
- next key word or phrase prompted – 'what else comes to mind when I say "science"?')
- can any of the key words or phrases used be put together - which, and why (move 'post-its' around on the board until they are happy with the groupings they've made as a group; moderator to track the discussion of what can be put with what else)
- what would we call that group, and why; who 'personifies' each group, and why?
- is there an image that they have in their mind of an event which sums up this group?
- are there any groups/issues missing – what and why?

- what would they call the whole board/chart – and why?
- who best communicates what is on this board to us, the general public; how and why?
- example(s) from The Wellcome Trust fed in, as and when appropriate, in order to stimulate discussion; generally
  - what, if any, of the above would they say they were actively interested in and why?
  - what form does that interest take?
  - how easy is it to find out about the above?
  - where, how often and which are the credible, interesting, readable sources?
  - what are the questionable sources, how do they approach it, and why do they find them questionable?
  - how much realistically do they want to know themselves, and how much should simply be made available to anyone who's interested – and why?
- what is the one key image that sums the whole thing up?
- what is the key 'mood' that sums up how they feel about science? (Using projectives, personification, images etc.)

Short 'breather' exercise to re-energize the group (maybe choosing scientists, and people who are into science from collage boards, or personifying the typical scientist, sending them on a blind date with a scientist (where would they take them, what would they talk about, would the respondents have fun, what would they get out of the date, etc.?)

Then asked – how would you feel if your son/daughter or younger brother or sister came to you and said 'I want a career in science' – and why?

The same exercise repeated for 'engineering'. Engineering then compared with science – differences, similarities, particularly in terms of the examples they use.

Then the same exercise repeated for 'technology'.

Technology then compared with both science and engineering – differences, similarities, particularly in terms of the examples they use.

### 3. The typical day

Respondents to take the moderator through a typical day – what do they do and when.

Then respondents asked to go through the day again, identifying where, when and how science, engineering and technology have an impact – whether that is in terms of what they read, what they do, or who they see.

How do they feel about how science, engineering and technology touches them, their families, and their work (written on flipchart)?

How would they characterize their attitude to science, engineering and technology generally (write summary title of each type of attitude identified in the group on index cards to hold against issues in the flipchart later)?

- what are the differences in their attitudes to science, engineering and technology – and how do they make sense of the whole picture?
- what are the key elements behind their attitudes?
  - what are they probed, and what do they mean for the respondent?
  - how do the rest of the group feel about each element identified?
  - how important is that element in making up their attitudes?
  - how do the elements relate to one another (does one contradict another – and how then do they resolve those contradictions)?
- who do they feel they share their attitudes with (perhaps using collages, and projectives)?
- can they give an example to show their attitudes in practice?
- if they had to give this attitude a label, what would it be and why?

Each type of attitude identified taken through the issues identified from the first part of the discussion – how do they feel about those issues, what are the driving elements in forming attitudes and opinions (grouped under appropriate headings).

## 4. Elements important to attitudes

Then following the prompted, plus other specific issues *which had not been spontaneously raised*:

### **Risk**

- how would they characterize their attitude to risk?
- what difference does this make to how they feel about science, engineering and technology, and why?

### **Trust in**

- scientific experts
- other 'practitioners' (technology manufacturers)
- government
- what makes them say that/what makes them feel like that?
- what would make them change the way they feel?

### **Knowledge and information**

- how do they feel about science, engineering and technology knowledge, and new knowledge in the field?
- where do they feel there is a lack of knowledge, and how do they feel about that?

### **Change**

- generally, how would they characterize how they feel about change, and the speed of change?
- and in the context of science, engineering and technology?

**Profit and private enterprise**

- what role do they feel profit and private enterprise has in science, engineering and technology, why, and how do they feel about that?
- what difference does this make to their attitudes towards science, engineering and technology generally, and why?

**Religious attitudes**

- would they call themselves religious – in what way; what are they comfortable saying about their beliefs?
- what difference do those attitudes make to how they feel about science, engineering and technology?

**Percentages and emotion**

- how do they feel about 'statistics' such as "there is a 99.9 per cent chance that x is safe", and why – in a variety of contexts?
- what role does emotion have in making sense of science, engineering and technology and in their attitudes towards it?
- and is it different in different contexts – and why?

What else makes a difference that we haven't talked about? (Fully probed.)

## 5. Collating, ranking and summarizing clusters

Respondents then to summarize each attitude cluster, which attitudes are crucial to that cluster, what are the important variables within each cluster, and demonstrate how that attitude cluster would react to:

- GM food – or other biotechnology, biosciences type issue (animal, human or plant?)
- Dumping nuclear waste at sea (or anything else to illustrate energy)?
- Space probes?

...in order to tease out how those attitudes inform real issues.

## 6. Conclusion

Throughout this, moderators will probe claimed attitudes fully, to ensure they are 'real' and not politically correct 'fronts'; they will also ask for examples and 'test' the attitudes amongst the rest of the group to understand how deeply this attitude is held, and how it is transposed into real day-to-day decisions and thought.

Finally, what recommendations would they make to the government and science-related institutions in order to improve the communication of scientific information; i.e. how they would like to be communicated with, by whom, when, in relation to science.

Re-convened group explained, nominated attitudes noted against names, and group closed.

# Appendix 3

## Quantitative questionnaire

Harris Research, Holbrooke House, 34-38 Hill Rise, Richmond, Surrey TW10 6UA

### Science and Engineering - main

FINAL

(December 22, 1999)

JN :69066 (1)-(5)

SN : (6)-(10)

SAMPLE POINT 

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 (11)-(13)

POINT

VERSION CODE (14)

CARD No. (15)

RESPONDENT NAME: Mr/ Mrs/ Miss/ Ms \_\_\_\_\_

RESPONDENT ADDRESS: \_\_\_\_\_

POST CODE: \_\_\_\_\_ TELEPHONE No. \_\_\_\_\_

INTERVIEW LENGTH: \_\_\_\_\_

#### INTERVIEWER DECLARATION:

I confirm this interview has been carried out within the Code of Conduct and in person with the respondent named, who was not previously known to me. I have followed the instructions and have asked all the questions in full as required.

Name (PRINT): \_\_\_\_\_ Signed: \_\_\_\_\_ Date: \_\_\_\_\_

Q-AIRE SIGN OFF Field/Tel: \_\_\_\_\_ Production: \_\_\_\_\_ DP: \_\_\_\_\_

Q-AIRE SIGN OFF Exec 1: \_\_\_\_\_ Exec 2: \_\_\_\_\_

Good morning/afternoon/evening, my name is ..... and I am from Harris Research. We are conducting a survey about the public's attitudes towards some current issues that concern us all. Would you be able to spare some time to give me your views?

**S1 Can I just check that you are aged 16 or over  
IF NO, THANK RESPONDENT AND CLOSE**

(16) - (17)

**SHOWCARD A**

Q1 I'd like to begin by asking you a few questions about yourself and the sorts of things you like to do in your free time.

There are a lot of issues in the news and it's hard to keep up with every area. I'm going to read to you a short list of issues, and for each one I would like you to tell me if you are very interested, moderately interested or not interested.

**READ OUT**

	<b>Very interested</b>	<b>Moderately interested</b>	<b>Not interested</b>	<b>Don't know</b>	
International current affairs	1	2	3	X	(18)
New scientific discoveries	1	2	3	X	(19)
New inventions and technologies	1	2	3	X	(20)
Energy/nuclear power issues	1	2	3	X	(21)
Medical discoveries	1	2	3	X	(22)
Environmental issues	1	2	3	X	(23)
Economics and finance	1	2	3	X	(24)
Health issues	1	2	3	X	(25)
Welfare and social exclusion: for example, drugs and poverty	1	2	3	X	(26)
Sport	1	2	3	X	(27)
UK politics	1	2	3	X	(28)
New films	1	2	3	X	(29)
Music	1	2	3	X	(30)
Science issues	1	2	3	X	(31)
Education	1	2	3	X	(32)
					Q2

**SHOWCARD B**Q2 What sort of TV programmes do you enjoy watching? **(MULTICODE)****SHOWCARD B**Q3 Which ONE of these do you enjoy the most? **(SINGLE CODE)**

	<b>Q2</b>	<b>Q3</b>
	<b>Which TV progs. watched</b>	<b>One enjoyed the most</b>
	(33)	(36)
A) Dramas	1	1
B) Soaps	2	2
C) Films	3	3
D) Variety/family shows	4	4
E) Comedy	5	5
F) Chat shows	6	6
G) Quiz shows/panel games	7	7
H) Music shows	8	8
I) Arts programmes	9	9
	(34)	(37)
J) News	1	1
K) Current affairs	2	2
L) Documentaries	3	3
M) Religious	4	4
N) Education	5	5
O) Sport	6	6
P) Science	7	7
Q) Wildlife	8	8
R) Children's	9	9
	(35)	(38)
S) Hobbies/Leisure	1	1
T) 'Fly-on-the-wall' programmes	2	2
Other (code and write in)	0	0
Don't know	X	X
None	9	9

Q4



Q4

---

 Q4a About how many hours a WEEK would you say you spend watching TV? **SINGLE CODE**

	(39)	
Under 7 hours	1	
7 - 14 hours	2	
15 - 21 hours	3	
22 - 28 hours	4	
29 - 35 hours	5	
36 - 42 hours	6	
More than 42 hours	7	Q4b
None	9	
Don't know	X	Q5a

---

 Q4b And which TV channel would you say you watch most often? **SINGLE CODE**

	(40)	
BBC1	1	
BBC2	2	
ITV	3	
C4 or S4C	4	
C5	5	
Cable (WRITE IN WHICH) _____	0	(41)
Satellite (WRITE IN WHICH) _____	0	(42)
Don't know	X	

---

 Q5a About how many hours a WEEK would you say you spend listening to the radio? **SINGLE CODE**

	(43)	
Under 3 hours	1	
3 - 6 hours	2	
7 - 14 hours	3	
15 - 21 hours	4	
22 - 28 hours	5	
29 - 35 hours	6	
35 + hours	7	Q5b
None	9	
Don't know	X	Q6a

**SHOWCARD C**

Q5b And which of the following best describes the type of radio station you listen to? Please choose up to two.  
**CODE UP TO TWO ONLY**

	(44)
<b>Music:</b> Current and recent pop and rock chart hits (usually on FM)	1
Golden oldies and classic hits of last 30-40 years (usually on AM)	2
Dance music (soul, funk, reggae, rap, house, acid, usually on FM)	3
Classical music (usually on FM)	4
Any other mainly music-based station (AM or FM)	5
<b>Mostly speech/talk (news, phone-ins, discussion):</b> Radio 4	6
Radio 5	7
Local BBC	8
Other speech or talk	9
Any other type of station	0
Don't know	X

Q6a

**SHOWCARD D**

Q6a Which DAILY newspapers, if any, do you read regularly? By regularly I mean at least three issues out of every four. **MULTICODE**

<i>Express</i>	1	(45)
<i>Daily Mail</i>	2	
<i>Mirror</i>	3	
<i>Daily Record</i>	4	
<i>Daily Telegraph</i>	5	
<i>The Financial Times</i>	6	
<i>Guardian</i>	7	
<i>Independent</i>	8	
<i>Daily Star</i>	9	
<i>Sun</i>	1	(46)
<i>The Times</i>	2	
Other (code and write in) _____	0	
None	9	
Don't know	X	

Q6b

**SHOWCARD E**

Q6b And which SUNDAY newspapers, if any, do you read regularly? By regularly I mean at least three issues out of every four. **MULTICODE**

<i>Independent on Sunday</i>	1	(47)
<i>Mail on Sunday</i>	2	
<i>News of the World</i>	3	
<i>The Observer</i>	4	
<i>The People</i>	5	
<i>Sunday Express</i>	6	
<i>Sunday Mirror</i>	7	
<i>Sunday Sport</i>	8	
<i>Sunday Telegraph</i>	9	
<i>Sunday Times</i>	1	(48)
<i>Sunday Post</i>	2	
<i>Sunday Mail</i>	3	
Any other Sunday Paper	4	
None	9	
Don't know	X	

Q7

Q7 Have you read any books recently? By recently I mean within the last 12 months?

	(49)	
Yes	1	<b>Go to Q8</b>
No	2	<b>Go to Q9</b>
Don't know	X	

**IF YES AT Q7**

**SHOWCARD F**

---

Q8 What sort of books do you read?

**MULTICODE**

			(50)	
	<b>Fiction:</b>	Horror	1	
		Crime	2	
		Romance	3	
		Science fiction	4	
		War	5	
	Other fiction (please specify) _____		0	(51)

			(52)	
	<b>Non-fiction:</b>	Travel	1	
		Biography	2	
		History	3	
		Gardening	4	
		Cookery	5	
		Science/engineering - general interest books	6	
		Science/engineering - textbooks	7	
	Other non-fiction (please specify) _____		0	(53)
		Don't know	X	

Q9

Q9 And do you read any magazines regularly? By regularly I mean at least three out of every four editions?

		(54)	
	Yes	1	<b>Go to Q10</b>
	No	2	<b>Go to Q11a</b>
	Don't know	X	

## IF YES AT Q9

## SHOWCARD G

Q10 Which types of magazines do you read regularly?

## MULTICODE

	(55)	
Women's weekly magazines (such as <i>Best, Hello, More, OK</i> etc)	1	
Women's monthly magazines (such as <i>Elle, Cosmo, Prima</i> )	2	
Men's lifestyle (such as <i>GQ, Loaded</i> )	3	
Lifestyle (such as <i>Country Life, Homes and Gardens</i> )	4	
Science magazines	5	
Sports magazines	6	
Hobby magazines (such as photography, food, music)	7	
TV guides/listing magazines	8	
Other (CODE AND WRITE IN)	0	(56)
Don't know	X	

Q11a

Q11a Do you have access to a computer at all? IF 'YES' PROBE FOR SOURCE

## MULTICODE

	(57)	
Yes - at home	1	
Yes - at work	2	
Yes - at college	3	
Yes - via the library	4	
Yes - via friends	5	
Yes - via Internet cafes	6	Go to Q11b
No	9	
Don't know	X	Go to Q11d

Q11b Do you have access to the Internet? IF 'YES' PROBE FOR SOURCE

## MULTICODE

	(58)	
Yes - at home	1	
Yes - at work	2	
Yes - at college	3	
Yes - via the library	4	
Yes - via friends	5	
Yes - via Internet cafes	6	Go to Q11c
No	9	
Don't know	X	Go to Q11d

Q11c And do you personally use the Internet or not?  
**SINGLE CODE**

(59)

Yes	1
No	2
Don't know	X

Q11d

**SHUFFLE GREEN CARDS  
 USE SHUFFLE BOARD**

Q11d Here are some general statements other people have made about some issues. Please sort the cards onto this board to show how much you agree or disagree with each one.

**ASK RESPONDENT TO SORT CARDS, THEN CODE RESPONSES BELOW.**

	Agree strongly	Agree	Neither	Disagree strongly	Disagree	Don't know	
1. You have to trust experienced people to make decisions	1	2	3	4	5	X	(60)
2. What people like me think will make no difference to the government	1	2	3	4	5	X	(61)
3. Politicians need specialist help to regulate some areas	1	2	3	4	5	X	(62)
4. People shouldn't tamper with nature	1	2	3	4	5	X	(63)
5. I enjoy new situations and challenges	1	2	3	4	5	X	(64)
6. It is important for me to keep on learning new skills	1	2	3	4	5	X	(65)
7. Nothing is ever completely safe	1	2	3	4	5	X	(66)

Q12a

**SKIP 67-80  
 START CARD 2  
 DUP 1-14  
 15=2**

**SHOWCARD H****Q12a ASK ALL**

Which if any of the things on this card have you visited or done in the last 12 months?

**Q12b (ONLY ASK IF VISITED OR BEEN TO IN THE LAST 12 MONTHS AT Q12a)** How many times have been/visited (.....) in the last 12 months?

**Q12c** Of those that you have not visited or been to in the last 12 months, which if any would you be interested in attending/visiting?

	(A) Which have you visited/been to?		(B) How many times?					(C) Which of these are you interested in?
	Yes	No	1-2	3-5	6-8	8+	DK	Yes
<b>A) Visited a museum or science centre</b>	1 (16)	2	1	2	3 (29)	4	X	1 (42)
<b>B) Visited an art gallery</b>	1 (17)	2	1	2	3 (30)	4	X	2
C) Visited a zoo	1 (18)	2	1	2	3 (31)	4	X	3
D) Visited a theme park	1 (19)	2	1	2	3 (32)	4	X	4
E) Visited a planetarium	1 (20)	2	1	2	3 (33)	4	X	5
F) Been to a lecture/talk on a subject that was of interest to you	1 (21)	2	1	2	3 (34)	4	X	6
G) Been to a meeting or debate on a subject that was of interest to you	1 (22)	2	1	2	3 (35)	4	X	7
H) Been to a visitor centre (e.g. at a tourist spot)	1 (23)	2	1	2	3 (36)	4	X	8
I) Been to the cinema	1 (24)	2	1	2	3 (37)	4	X	9
J) Visited a historic house or gardens	1 (25)	2	1	2	3 (38)	4	X	1 (43)
K) Been to a sporting event	1 (26)	2	1	2	3 (39)	4	X	2
L) Been to the theatre	1 (27)	2	1	2	3 (40)	4	X	3
M) Been to a concert or to the opera	1 (28)	2	1	2	3 (41)	4	X	4

Q13a **IF ANY VISITS MADE TO AN ART GALLERY, MUSEUM OR SCIENCE CENTRE AT Q12a; OTHERS GO TO Q14**

Thinking about your most recent museum or art gallery visit, did it specialize in anything in particular or was it a general interest museum? **SINGLE CODE**

Q13b **(If more than one visit) And what about the visit before that? SINGLE CODE**

	<b>Q13a</b>	<b>Q13b</b>
	<b>Last visit</b>	<b>2nd last</b>
	(44)	(46)
Art	1	1
History (including local history)	2	2
Music	3	3
Science/technology/engineering	4	4
Some other special interest museum (e.g. stamps, toys)	5	5
General interest museum	6	6
	(45)	(47)
Other	0	0
Don't know	X	X

**Q14**

**ASK ALL/SHOWCARD I**

Q14 Which, if any, of these things do you do in your spare time? **MULTICODE**

	(48)
A) Playing sport/exercising	1
B) Watching sport	2
C) Watching TV	3
D) Listening to music	4
E) Reading books	5
F) Shopping	6
G) Going to pubs/clubs	7
H) Eating out	8
I) Charities/voluntary work	9
	(49)
J) Walking	1
K) DIY	2
L) Gardening	3
M) Theatre/cinema	4
N) Sewing, knitting and crafts	5
O) Collecting things (e.g. stamps)	6
P) Go to church or another place of worship	7
Other (code and write in)	(50)
	0
Nothing	9
Don't know	X



Q15 How many, if any, science activities or festivals have you been to in the last 12 months? For example, activities at a local school or university during National Science Week or a regional festival such as the Edinburgh International Science Festival.

	(51)	
1-2	1	
3-5	2	
6-8	3	
More than 8	4	<b>Go to Q16</b>
None	9	
Don't know	X	<b>Go to Q19a</b>

Q16 Thinking about the last science activity or festival you went to, why did you go to it?

**DO NOT PROMPT**

	(52)
Personal interest	1
Taking children	2
Taking visitors	3
Named speaker	4
Interesting subject	5
Other (CODE AND WRITE)	(53)
	0
Don't know	X

**Q17**

Q17 And did you enjoy it?

	(54)	
Yes	1	
No	2	<b>Go to Q18</b>
Don't know	X	<b>Go to Q19a</b>

Q18 What was it that you particularly enjoyed/did not enjoy?

**PROBE FULLY**

\_\_\_\_\_ (55)

\_\_\_\_\_ (56)

\_\_\_\_\_ (57)

\_\_\_\_\_ (58)

**Q19a**

**SHUFFLE PINK CARDS  
USE SHUFFLE BOARD**

Q19a I am now going to show you some statements that other people have made about some topical issues.  
Please sort the cards onto this board to show how much you agree or disagree with each one.

**ASK RESPONDENT TO SORT CARDS, THEN CODE RESPONSES BELOW.**

	<b>Agree strongly</b>	<b>Agree</b>	<b>Neither</b>	<b>Disagree</b>	<b>Disagree strongly</b>	<b>Don't know</b>	
<b>1.</b> The achievements of science are overrated	1	2	3	4	5	X	(59)
<b>2.</b> Because of science, engineering and technology there will be more opportunities for the next generation	1	2	3	4	5	X	(60)
<b>3.</b> Science and technology are making our lives healthier, easier and more comfortable	1	2	3	4	5	X	(61)
<b>4.</b> The benefits of science are greater than any harmful effects	1	2	3	4	5	X	(62)
<b>5.</b> Science makes our lives change too fast	1	2	3	4	5	X	(63)
<b>6.</b> The more I know about science the more worried I am	1	2	3	4	5	X	(64)
<b>7.</b> I cannot follow developments in science and technology because the speed of development is too fast	1	2	3	4	5	X	(65)
<b>8.</b> Science and technology is too specialized for most people to understand it	1	2	3	4	5	X	(66)
<b>9.</b> Science is getting out of control and there is nothing we can do to stop it	1	2	3	4	5	X	(67)
<b>10.</b> The speed of development in science and technology means that it cannot be properly controlled by Government	1	2	3	4	5	X	(68)
<b>11.</b> Politicians are too easily swayed by the media's reaction to scientific issues, they should take more of a lead	1	2	3	4	5	X	(69)
<b>12.</b> Scientists should listen more to what ordinary people think	1	2	3	4	5	X	(70)
<b>13.</b> In general scientists want to make life better for the average person	1	2	3	4	5	X	(71)
<b>14.</b> The media sensationalizes science	1	2	3	4	5	X	(72)
<b>15.</b> Science is driven by business – at the end of the day it is all about money	1	2	3	4	5	X	(73)
<b>16.</b> It is important to know about science in my daily life	1	2	3	4	5	X	(74)
<b>17.</b> It is important that young people have a grasp of science and technology	1	2	3	4	5	X	(75)

Q19b

**SKIP 76-80-, START CARD 3, DUP 1-14, 15 =3**

**SHOWCARD J**

Q19b I'm now going to read out a list of scientific and technical issues. For each one could you please tell whether you are very interested, quite interested, neither interested nor disinterested, not very interested or not at all interested.

READ OUT...	Very interested	Quite interested	Neither	Not very interested	Not at all interested	Don't know	
Genetic testing	1	2	3	4	5	X	(16)
Human fertility testing	1	2	3	4	5	X	(17)
Space research and astronomy	1	2	3	4	5	X	(18)
New and faster methods of transport	1	2	3	4	5	X	(19)
Heart and other transplants	1	2	3	4	5	X	(20)
Computing and the Internet	1	2	3	4	5	X	(21)
Cloning	1	2	3	4	5	X	(22)
Telecommunications	1	2	3	4	5	X	(23)
New methods of food production and manufacture	1	2	3	4	5	X	(24)
New medicines	1	2	3	4	5	X	(25)
Research into climate change	1	2	3	4	5	X	(26)

Q19c

**SHOWCARD K**

Q19c For the same list of issues could you now please tell me how beneficial you feel that each of these developments has been or is likely to be to humanity, on a scale from very beneficial, quite beneficial, neither, not very beneficial or not at all beneficial

READ OUT...	Very beneficial	Quite beneficial	Neither	Not very beneficial	Not at all beneficial	Don't know	
Genetic testing	1	2	3	4	5	X	(27)
Human fertility testing	1	2	3	4	5	X	(28)
Space research and astronomy	1	2	3	4	5	X	(29)
New and faster methods of transport	1	2	3	4	5	X	(30)
Heart and other transplants	1	2	3	4	5	X	(31)
Computing and the Internet	1	2	3	4	5	X	(32)
Cloning	1	2	3	4	5	X	(33)
Telecommunications	1	2	3	4	5	X	(34)
New methods of food production and manufacture	1	2	3	4	5	X	(35)
New medicines	1	2	3	4	5	X	(36)
Research into climate change	1	2	3	4	5	X	(37)

Q20a

Q20a Which ONE word would you use to describe **scientists?** **SINGLE CODE**

Q20b Which ONE word would you use to describe **engineers?** **SINGLE CODE**

**SHOWCARD L**

Q21a And which, if any of these words would you use to describe **scientists**? Just read out the letter or letters that apply. **MULTICODE**

Q21b And which, if any, of these words would you use to describe **engineers**? Just read out the letter or letters that apply. **MULTICODE**

	Q20a SINGLE CODE	Q20b SINGLE CODE	Q21a MULTICODE	Q21b MULTICODE
	(38)	(42)	(46)	(50)
A) Detached	1	1	1	1
B) Enquiring	2	2	2	2
C) Friendly	3	3	3	3
D) Good at public relations	4	4	4	4
E) Honest	5	5	5	5
F) Independent	6	6	6	6
G) Intelligent	7	7	7	7
H) Largely funded by Government	8	8	8	8
I) Largely funded by industry	9	9	9	9
	(39)	(43)	(47)	(51)
J) Logical	1			1 1
K) Lonely	2	2	2	2
L) Male/mostly male	3	3	3	3
M) Methodical	4	4	4	4
N) Narrow-minded	5	5	5	5
O) Objective	6	6	6	6
P) Poor at public relations	7	7	7	7
Q) Poorly paid	8	8	8	8
R) Quiet	9	9	9	9
	(40)	(44)	(48)	(52)
S) Rational/logical	1	1	1	1
T) Responsible	2	2	2	2
U) Secretive	3	3	3	3
V) Selfish	4	4	4	4
W) Sociable	5	5	5	5
X) Socially responsible	6	6	6	6
Y) Too inquisitive	7	7	7	7
Z) Uncommunicative	8	8	8	8
AA) Witty	9	9	9	9
	(41)	(45)	(49)	(53)
AB) Powerful	1	1	1	1
Other (Please write in )	0	0		
None of these	9	9	9	9
Don't know	X	X	X	X

**SHUFFLE YELLOW CARDS****USE SHUFFLE BOARD**

Q22 I am now going to show you some more statements other people have made about some topical issues. Again as before please sort them on this board to show how much you agree or disagree with each one.

**ASK RESPONDENT TO SORT CARDS, THEN CODE RESPONSES BELOW.**

	<b>Agree strongly</b>	<b>Agree</b>	<b>Neither</b>	<b>Disagree</b>	<b>Disagree strongly</b>	<b>Don't know</b>	
<b>1.</b> We depend too much on science and not enough on faith	1	2	3	4	5	X	(54)
<b>2.</b> Scientists and engineers make a valuable contribution to society	1	2	3	4	5	X	(55)
<b>3.</b> Britain needs to develop science and technology in order to enhance its international competitiveness	1	2	3	4	5	X	(56)
<b>4.</b> I don't understand the point of all the science being done today	1	2	3	4	5	X	(57)
<b>5.</b> Finding out about new scientific developments is easy these days	1	2	3	4	5	X	(58)
<b>6.</b> There is so much conflicting information about science it is difficult to know what to do	1	2	3	4	5	X	(59)
<b>7.</b> I am not clever enough to understand science and technology	1	2	3	4	5	X	(60)
<b>8.</b> Politicians support science for the good of the country	1	2	3	4	5	X	(61)
<b>9.</b> Scientists seem to be trying new things without stopping to think about the risks	1	2	3	4	5	X	(62)
<b>10.</b> Rules will not stop researchers doing what they want behind closed doors	1	2	3	4	5	X	(63)
<b>11.</b> It is important to have some scientists who are not linked to business	1	2	3	4	5	X	(64)
<b>12.</b> Businesses that invest in science deserve to make a profit on their investments	1	2	3	4	5	X	(65)
<b>13.</b> Science is such a big part of our lives that we should take an interest	1	2	3	4	5	X	(66)
<b>14.</b> I am not interested in science and I don't see why I should be	1	2	3	4	5	X	(67)
<b>15.</b> Even if it brings no immediate benefits, scientific research which advances the frontiers of knowledge is necessary and should be supported by the Government	1	2	3	4	5	X	(68)
<b>16.</b> I am amazed by the achievements of science	1	2	3	4	5	X	(69)

Q23a

**SKIP 70-80**  
**START CARD 4, DUP 1-14, 15=4**

## SHOWCARD M

Q23a\* Looking at this list of sources of information, which, if any, would you generally trust to provide accurate information about scientific facts? Just read out the letter or letters.

### MULTICODE

Q23b\* Which ONE of these would you trust the most?

### SINGLE CODE

Q23c\* And which ONE would you trust the least?

### SINGLE CODE

	Q23a	Q23b ONE TRUST MOST	Q23c TRUST LEAST
	(16)	(18)	(20)
<b>A)</b> People working for broadsheet newspapers	1	1	1
<b>B)</b> People working for tabloid newspapers	2	2	2
<b>C)</b> People working for the popular scientific press, e.g. <i>New Scientist</i>	3	3	3
<b>D)</b> Government scientists	4	4	4
<b>E)</b> Scientists working for industry	5	5	5
<b>F)</b> Scientists in universities	6	6	6
<b>G)</b> Scientists working for charities (eg Imperial Cancer Research Fund)	7	7	7
<b>H)</b> Health campaigning groups (e.g. Alzheimers Society)	8	8	8
<b>I)</b> Environmental campaigning groups (e.g. Friends of the Earth, Greenpeace)	9	9	9
	(17)	(19)	(21)
<b>J)</b> Government advisory bodies	1	1	1
<b>K)</b> Government ministers/politicians	2	2	2
<b>L)</b> TV documentaries	3	3	3
<b>M)</b> TV news and current affairs programmes	4	4	4
<b>N)</b> Science books	5	5	5
<b>O)</b> Well-known scientists	6	6	6
<b>P)</b> Investigative journalists	7	7	7
Other (WRITE IN)	0	0	0
None	9	9	9
Don't know	X	X	X

\* The development of these questions draws on previous work on the issue of trust, including questions designed by MORI for the MORI/Wellcome Trust Survey of Scientists and the 1996 British Social Attitudes Survey.

Q24 Why do you think people choose to become scientists or engineers?  
**PROBE FULLY. DO NOT PROMPT.**

\_\_\_\_\_ (22)  
 \_\_\_\_\_ (23)  
 \_\_\_\_\_ (24)  
 \_\_\_\_\_ (25)  
**Q25**

Q25 Do you think that a career in science or engineering is a good choice?

	(26)	
Yes	1	<b>Go to Q26</b>
No	2	<b>Go to Q27</b>
Don't know	3	<b>Go to Q28</b>

IF YES AT Q25

Q26 Why?  
**PROBE FULLY**

\_\_\_\_\_ (27)  
 \_\_\_\_\_ (28)  
 \_\_\_\_\_ (29)

Q28

IF NO AT Q25

Q27 Why not?  
**PROBE FULLY**

\_\_\_\_\_ (30)  
 \_\_\_\_\_ (31)  
 \_\_\_\_\_ (32)

Q28

**ASK ALL/SHOWCARD N**

---

Q28 Which of the following statements on this card do you most agree with?  
**SINGLE CODE**

- |   |           |
|---|-----------|
| These days I hear and see <b>far too much</b> information about science           | (33)<br>1 |
| These days I hear and see <b>too much</b> information about science               | 2         |
| These days I hear and see about the <b>right amount</b> of information on science | 3         |
| These days I hear and see <b>too little</b> information about science             | 4         |
| These day I hear and see <b>far too little</b> information about science          | 5         |
| Don't know  | X         |

**SHOWCARD O**

Q29 In which, if any, of these ways do you currently get any information about science?

**READ OUT LETTERS - MULTICODE**

Q30 Thinking about the ways in which you currently receive information about science, which of these are you happy with? **READ OUT LETTERS - MULTICODE**

Q31 And which, if any, of these other ways would you like to receive information about science in the future?  
**READ OUT THE LETTERS - SELECT ONLY THOSE THAT HAVE NOT BEEN MENTIONED PREVIOUSLY - MULTICODE**

	<b>Q29 Current</b>	<b>Q30 Happy with</b>	<b>Q31 Additional preferred</b>
	(34)	(37)	(40)
<b>A) Audio tapes</b>	1	1	1
<b>B) Billboards/hoardings</b>	2	2	2
<b>C) Information in Braille for blind people</b>	3	3	3
<b>D) Children</b>	4	4	4
<b>E) Information in languages apart from English</b>	5	5	5
<b>F) The Internet/website</b>	6	6	6
<b>G) Leaflets</b>	7	7	7
<b>H) Magazines</b>	8	8	8
<b>I) Newspapers - local</b>	9	9	9
	(35)	(38)	(41)
<b>J) Newspapers - national</b>	1	1	1
<b>K) Products - e.g. food</b>	2	2	2
<b>L) Radio - local</b>	3	3	3
<b>M) Radio - national</b>	4	4	4
<b>N) Telephone information line</b>	5	5	5
<b>O) Teletext</b>	6	6	6
<b>P) Television news</b>	7	7	7
<b>Q) Television programmes, e.g. documentaries</b>	8	8	8
<b>R) Videos</b>	9	9	9
	(36)	(39)	(42)
<b>S) Information from government</b>	1	1	1
<b>T) Noticeboards</b>	2	2	2
<b>U) Nowhere</b>	3	3	3
Other (code and write in)	0	0	0
Don't know	X	X	X



**SHOWCARD P**

- Q32 And at which, if any, of these places do you currently get any information about science?  
**READ OUT LETTERS - MULTICODE.**
- Q33 Thinking about the places that you *currently* receive information about science from, which are you happy with?  
**READ OUT LETTERS - MULTICODE**
- Q34 And are there any other places that you would like to receive information about science in the future (of those not already selected)? **READ OUT THE LETTERS - SELECT ONLY THOSE THAT HAVE NOT BEEN MENTIONED PREVIOUSLY - MULTICODE**

	Q32 Current	Q33 Happy with	Q34 Additional preferred
	(43)	(45)	(47)
A) Council offices	1	1	1
B) Through the door/by mail	2	2	2
C) GP surgeries	3	3	3
D) Hospitals	4	4	4
E) In libraries	5	5	5
F) In restaurants	6	6	6
G) Schools/colleges	7	7	7
H) In shops	8	8	8
I) At work	9	9	9
J) Nowhere	0	0	0
	(44)	(46)	(48)
Other (code and write in) _____	0	0	0
Don't know	X	X	X

**C1**

And finally, just a few questions about you to ensure we talk to a good cross-selection of people.

C1 Code sex

	(49)
Male	1
Female	2

**C2**

**SHOWCARD Q**

C2 Which of these age groups do you belong to?

	(50)
16-24	1
25-34	2
35-44	3
45-54	4
55-59	5
60-64	6
65 +	6
Refused	9

**C3**

C3 SOCIAL CLASS

ESTABLISH WHETHER CHIEF INCOME EARNER IS ... READ OUT

WORKING (either full or part time)

1

RETIRED/NOT WORKING  
(but with private pension/other means)

2



UNEMPLOYED (less than 2 months)

3

OCCUPATION OF CHIEF INCOME EARNER

Write in full description of current or last main job and industry, and how many people work at that place of work.

Job:

Industry:

Position/Rank/Grade:

IF CHIEF INCOME EARNER IS SUPERVISOR/MANAGER OR SELF-EMPLOYED ASK... How many people is he/she responsible for? (Write in)


TOTAL NO. OF EMPLOYEES AT PLACE OF WORK  
(Write in)

UNEMPLOYED (over 2 months)

4

RETIRED/NOT WORKING  
(but on state pension or benefit only)

5



CODE SOCIAL GROUP E

NOW CODE SOCIAL GRADE	(51)
AB	1
C1	2
C2	3
D	4
E	5

**SHOWCARD R**

C4 On leaving full-time education, please tell me the **highest** level of qualifications you had obtained.

	(52)
GCSEs/CSEs/O levels/BTEC (first diploma) or equivalent/NVQ/SVQ level 1 or 2	1
A levels/Scottish Highers/BTEC (higher) or equivalent/NVQ/SVQ level 3/HNC	2
First degree or equivalent/NVQ/SVQ level 4/HND	3
Postgraduate degree	4
Professional qualification/chartered professional/NVQ/SVQ level 5	5
PhD	6
Still studying	7
None of the above	9
Don't know	X

**C5****SHOWCARD R**

C5 And what is the **highest** qualification you have in any area of **science**?

	(53)
GCSEs/CSEs/O levels/BTEC (first diploma) or equivalent/NVQ/SVQ level 1 or 2	1
A levels/Scottish Highers/BTEC (higher) or equivalent/NVQ/SVQ level 3/HNC	2
First degree or equivalent/NVQ/SVQ level 4/HND	3
Postgraduate degree	4
Professional qualification/chartered professional/NVQ/SVQ level 5	5
PhD	6
Still studying	7
None of the above	9
Don't know	X

C6 How many children are there in your household between the ages of... ?

	<b>None</b> (54)	<b>One</b> (55)	<b>Two +</b> (56)
11 and 15	1	1	1
5 and 10	2	2	2
Under 5	3	3	3

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**SHOWCARD S**

C7 Which of these ethnic groups do you consider you belong to?

**CODE ONE ONLY**

	(57)
White	1
Black - Caribbean	2
Black - African	3
Black - Other	4
Indian	5
Pakistani	6
Bangladeshi	7
Chinese	8
Mixed race	9
	(58)
Other ( <b>CODE AND WRITE IN</b> ) _____	0
Refused	9

**C8**

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**SHOWCARD T**

C8 Do you regard yourself as belonging to any particular religion? IF YES which one:

**CODE ONE ONLY DO NOT PROMPT**

	(59)
No religion	1
Christian - no denominations	2
Roman Catholic	3
Church of England/Anglican	4
Baptist	5
Methodist	6
Presbyterian/Church of Scotland	7
Free Presbyterian	8
Brethren	9
	(60)
United Reform Church (URC)/Congregational	
Other Protestant (code and write in) _____	1
Other Christian (code and write in) _____	2
Hindu	3
Jewish	4
Muslim/Islam	5
Sikh	6
Buddhist	7
Other non-Christian (code and write in) _____	8
Refused/not willing to say	9

**C9**

**SHOWCARD U**

C9 Which of these statements on this card best describe you?

**SINGLE CODE**

	(61)
Very religious	1
Somewhat religious	2
Neither religious nor nonreligious	3
Somewhat nonreligious	4
Very nonreligious	5
(Can't choose)	X

**C10****SHOWCARD V**C10 Which group on the card is closest to the *total gross income* of everyone in your household, from all sources before tax? Please include state benefits, child benefits and housing benefits.**JUST READ OUT THE LETTER THAT APPLIES**

WEEKLY	ANNUAL	(62)
A) Under £60	A) Under £3000	1
B) £60–£119	B) £3000–£5999	2
C) £120–£199	C) £6000–£9999	3
D) £200–£299	D) £10 000–£14 999	4
E) £300–£499	E) £15 000–£24 999	5
F) £500–£699	F) £25 000–£34 999	6
G) £700–£899	G) £35 000–£44 999	7
H) £900–£1099	H) £45 000–£54 999	8
I) £1100 or more	I) £55 000+	9
Refused/Don't know	Refused/Don't know	0

**C11**

C11 Do you have the regular use of a car, van or motorcycle?

	(63)
Yes	1
No	2

**THANK RESPONDENT AND CLOSE.**

# Appendix 4

## Sampling and analysis technical report

Prepared by: TNS Harris (Taylor Nelson Sofres Group),  
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### Methodology

The research comprised a quantitative survey among adults in Britain aged 16 and over.

### Sample size and structure

A total of 1839 interviews were conducted. This sample comprised three components, as follows:

1. A core representative sample of 1239 British adults aged 16 and over.
2. A 'booster' sample of 400 additional interviews with adults in Scotland, aged 16 and over. This was included to allow a more detailed separate analysis of science, engineering and technology attitudes in Scotland.
3. A 'booster' sample of 200 additional interviews with ethnic minorities aged 16 and over. 'Ethnic minorities' were defined as people who did not classify themselves as 'white'. This sample was included to allow separate analysis of the views of ethnic minorities, and some limited analysis of the differences in views between the South Asian and black African-Caribbean communities.

### Sampling method

The sampling method used for the core sample and the Scottish booster samples was 'random location sampling'. This is a sophisticated form of quota sampling, in which interviewers are given very small geographical areas (enumeration districts, each comprising about 150 households) in which to obtain a quota of interviews. Enumeration districts were selected with probability proportional to population size, after stratification by MOSAIC,<sup>1</sup> a socio-demographic classificatory system.

In total, 82 enumeration districts were used for the core sample, and 28 for the Scottish booster sample.

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<sup>1</sup>MOSAIC is a classification system built using data from a number of sources, including the 1991 Census, the Electoral Roll and the Postcode Address File. It uses 87 different variables to classify areas. These variables include demographic, socioeconomic, housing, financial and retail based measures. The result is a system which allocates all areas of the country to one of 12 MOSAIC lifestyle groupings. These can be further subdivided into 52 MOSAIC types.

## Core sample

Esher	London, W1	Stourbridge	Middlesborough (x2)
Southampton (x 2)	London, E15	SW Avon	Ormesby
Maidstone	Ruislip	Stoke	Cleveland
Chertsey	Romford (x2)	Worcester	Carlisle
Guildford	Hayes	Nottingham	Sheffield (x2)
Gosport	Bristol	Wigston	Shipleigh
Epsom	Nailsworth	Grantham	Tadcaster
Eastbourne	Blandford Forum	Chesterfield	Deepcar
Ventnor	Burnham on Sea	Northampton	Doncaster
Beighton, Norwich	Bournemouth	Lincoln	Huddersfield
Peterborough	Teignmouth	Blackburn	Edinburgh
Mulbarton, Norwich	Yeovil	Altrincham	Kilbride
Chelmsford	Ponther	Preston	Shotts
High Wycombe	Pencoed	Radcliffe	Airdrie
Harwich	Newport	Widness	Glasgow (x2)
Milton Keynes	Brecon	Liverpool	Helensborough
London, NW7	Birmingham	Burnley	Forres, Morayshire
London, E1	West Bromwich	Chester	
London, E10	Dudley	Lytham St Annes	
London, W12	Malvern	Southport	

## Scottish boost

Falkirk	Lossiemouth	Glasgow (Baillieston)	East Kilbride
Brightons	Forres	Glasgow (x4)	Perth (x2)
Kirkcaldy	Edinburgh (x4)	Paisley	Blairgowrie
Dunfermline	Livingston	Lanark	
St Andrews	Kilbride	Wishaw	
Aberdeen	Helensborough	Uddingston	

For the booster sample of ethnic minorities, a different sampling approach was used, as the area covered by an enumeration district is too small to be viable for the sampling of minorities. Instead interviewers were issued with wards – areas comprising about 2000 households.

With any study of ethnic minorities, there is a decision to be made about which areas the interviews should be conducted in. The cheapest solution is only to conduct interviews in areas with a very high penetration of ethnic minorities. At the other end of the scale, the most costly alternative is to conduct interviews even in the lowest penetration areas, where perhaps only 1 per cent of residents are from ethnic minority groups. In reality, most studies use an approach which lies between the two extremes, and which ensures that interviews are conducted in a wide range of areas, but areas where ethnic minorities only represent a tiny proportion of residents are excluded.

For this particular study, interviews were conducted in wards where the ethnic minority population accounted for at least 10 per cent of residents. We estimate that nearly three quarters of all ethnic minorities live in such areas, and would therefore have had the opportunity for inclusion in this study. While we believe that this represents a very high quality sample of ethnic minorities, there are limitations to it. There has been previous work conducted on the differences between minorities living in low and high density areas, and it is clear that those who live in low density areas tend to be more affluent, and more integrated into the 'white' community. While we cannot predict exactly how the attitudes of these people to science, engineering and technology issues would differ to those living in high density areas, we would suspect that they would have better access to and information on science, engineering and technology, and that their attitudes would be more informed. Black people in the core areas for the main sample are not excluded but obviously their numbers will be very small.

A total of 26 wards were used. These were selected with probability proportional to the ethnic minority population.

## Ethnic boost

London, Hackney	London, Merton
London, Haringey	London, Waltham Forest
London, Islington	Bradford
London, Lambeth	Wakefield
London, Newham	Leicester
London, Southwark	Luton
London, Tower Hamlets	High Wycombe
London, Westminster	Birmingham (x2)
London, Brent (x2)	Coventry
London, Ealing	Wolverhampton
London, Enfield	Manchester
London, Harrow	Burnley

## Fieldwork

All fieldwork was conducted face-to-face, in respondents' own homes by Fieldcontrol, a fieldwork agency within the Taylor Nelson Sofres Group. Fieldcontrol works to IQCS (Interviewer Quality Control Scheme) standards, and conducts the following quality control:

- all interviewers new to research receive an initial three-day training in market research techniques
- refresher training is undertaken on a regular basis
- all interviewers are accompanied on their first assignment and thereafter at least once a year
- each interviewer has a minimum of one accompanied appraisal and one telephone appraisal each year
- interviewers' work is randomly selected from each survey for validation
- for each survey, a minimum of 10 per cent of respondents are re-contacted to verify key details from the survey.

Fieldwork took place between 6 and 21 January 2000.



## Questionnaire

The questionnaire took about 35 minutes to administer and comprised a series of structured questions covering:

- media habits and hobbies
- access to a PC and the Internet
- science, engineering and technology and other activities engaged in
- attitudes to science, engineering and technology
- interest in and perceived benefits of different aspects of science, engineering and technology
- impressions of people working in science, engineering and technology, and attitudes to science, engineering and technology as a career choice
- information channels used for science, engineering and technology, and preferred information channels
- classification

A copy of the questionnaire is presented in Appendix 3.

Prior to the main fieldwork, the questionnaire was subject to a small-scale pilot, comprising about 10 interviews conducted with a range of different types of respondents. The pilot took place in London and Bristol. For the pilot, interviewers were accompanied by a TNS Harris researcher and a representative of the OST. They observed the interviews, noting any problems or opportunities for improvement. In addition, the interviewers themselves made a number of suggestions for improvement. The final questionnaire was then agreed.

### Ethnic RIM Weights

Age	White	Black	Asian	Other
16-34	31.71%	0.83%	1.50%	0.76%
35-64	43.46%	0.65%	1.34%	0.62%
65+	18.79%	0.11%	0.18%	0.05%
Total	93.96%	1.60%	3.02%	1.42%

Source: Labour Force Survey 1996-97

The second two of the above objectives were achieved by using a more complex weighting matrix, which took into account sex, age, social grade and region. The source for this data was the BARB Establishment Survey, December 1996-98.

## 2.5

### Analysis and weighting

Questionnaires were returned by interviewers to TNS Harris, where they were manually checked and answers to open-ended questions were coded in line with codeframes developed from the answers given. The data were then entered onto the computer.

At the analysis stage weighting was applied to the data to correct for the following:

1. Firstly, to downweight the ethnic minority booster samples to its correct proportions within the total GB population.
2. Secondly, to downweight the Scottish booster sample to its correct proportion with the total GB population.
3. Thirdly, to correct for minor demographic imbalances within the final sample. This comprised a detailed weighting matrix, involving sex, age, social grade and region.

The first of the above objectives was achieved by using a rim weighting technique, which involved separate weighting of white, black, Asian and other respondents. The source for this was the 1996-97 Labour Force Survey, a major Government study.

The aim of these two weighting processes is to make the sample *fully representative of the British adult population*.

Demographic Interlaced Weights

<b>Sex</b>	<b>Age</b>	<b>Social grade</b>	<b>Region</b>	<b>Target</b>
Female	16-34	ABC1	MIDS	1.82%
Female	16-34	ABC1	NORTH	1.78%
Female	16-34	ABC1	SCOTLAND	0.67%
Female	16-34	ABC1	SOUTH	3.78%
Female	16-34	C2	MIDS	1.10%
Female	16-34	C2	NORTH	0.89%
Female	16-34	C2	SOUTH	1.42%
Female	16-34	C2/DE	SCOTLAND	0.85%
Female	16-34	DE	MIDS	1.21%
Female	16-34	DE	NORTH	1.50%
Female	16-34	DE	SOUTH	1.52%
Female	35-54	ABC1	MIDS	2.07%
Female	35-54	ABC1	NORTH	1.96%
Female	35-54	ABC1	SCOTLAND	0.77%
Female	35-54	ABC1	SOUTH	4.14%
Female	35-54	C2	MIDS	1.17%
Female	35-54	C2	NORTH	1.04%
Female	35-54	C2	SOUTH	1.43%
Female	35-54	C2/DE	SCOTLAND	0.80%
Female	35-54	DE	MIDS	1.13%
Female	35-54	DE	NORTH	1.33%
Female	35-54	DE	SOUTH	1.40%
Female	55+	ABC1	MIDS	1.54%
Female	55+	ABC1	NORTH	1.49%
Female	55+	ABC1	SCOTLAND	0.53%
Female	55+	ABC1	SOUTH	3.16%
Female	55+	C2	MIDS	0.85%
Female	55+	C2	NORTH	0.77%
Female	55+	C2	SOUTH	1.09%
Female	55+	C2/DE	SCOTLAND	1.06%
Female	55+	DE	MIDS	2.15%
Female	55+	DE	NORTH	2.25%
Female	55+	DE	SOUTH	2.65%

<b>Sex</b>	<b>Age</b>	<b>Social grade</b>	<b>Region</b>	<b>Target</b>
Male	16-34	ABC1	MIDS	1.86%
Male	16-34	ABC1	NORTH	1.81%
Male	16-34	ABC1	SCOTLAND	0.68%
Male	16-34	ABC1	SOUTH	3.96%
Male	16-34	C2	MIDS	1.28%
Male	16-34	C2	NORTH	1.14%
Male	16-34	C2	SOUTH	1.62%
Male	16-34	C2/DE	SCOTLAND	0.88%
Male	16-34	DE	MIDS	1.15%
Male	16-34	DE	NORTH	1.39%
Male	16-34	DE	SOUTH	1.38%
Male	35-54	ABC1	MIDS	1.99%
Male	35-54	ABC1	NORTH	1.91%
Male	35-54	ABC1	SCOTLAND	0.74%
Male	35-54	ABC1	SOUTH	4.03%
Male	35-54	C2	MIDS	1.34%
Male	35-54	C2	NORTH	1.18%
Male	35-54	C2	SOUTH	1.68%
Male	35-54	C2/DE	SCOTLAND	0.81%
Male	35-54	DE	MIDS	1.07%
Male	35-54	DE	NORTH	1.27%
Male	35-54	DE	SOUTH	1.28%
Male	55+	ABC1	MIDS	1.40%
Male	55+	ABC1	NORTH	1.27%
Male	55+	ABC1	SCOTLAND	0.43%
Male	55+	ABC1	SOUTH	2.71%
Male	55+	C2	MIDS	0.97%
Male	55+	C2	NORTH	0.85%
Male	55+	C2	SOUTH	1.22%
Male	55+	C2/DE	SCOTLAND	0.80%
Male	55+	DE	MIDS	1.40%
Male	55+	DE	NORTH	1.51%
Male	55+	DE	SOUTH	1.68%

Source: BARB Establishment Survey 2 years ending Dec. 1998

## Outputs

The following outputs have been produced:

1. tables, based on a representative sample of the British adult population, showing each question cross-analysed by a series of demographic and behavioural variables;
2. as above, but based solely on the Scottish sample (ie. the Scottish interviews from the core sample, plus the Scottish booster);
3. a factor and cluster analysis of the attitudinal data in the questionnaire. From this, six attitudinal cluster groups were derived: these have been used in a cross-analysis of all of the questions. This has been produced as a separate tables volume.

## Factor and cluster analysis

In total, 40 attitude statements developed from the qualitative research to reflect attitudes to science uncovered were included in the quantitative research. These 40 statements were used in a factor and cluster analysis, as described below. The ultimate aim of this analysis procedure was to identify a number of attitudinal groups, which could then be examined in terms of their demographics, behaviour, attitudes and size.

### Factor analysis

This is a factor extraction method used to form uncorrelated linear combinations of the observed variables. The first component has maximum variance between people. Successive components explain progressively smaller proportions of the variance and are all uncorrelated with each other.

From the 40 statements, a total of nine different factors were identified. These explained a total of 51 per cent of the variance within the data. Within this, two factors were very strong, together accounting for 35 per cent of the variance. These were factors to do with how enthusiastic respondents were about science, and how concerned they were about science and how it is controlled. After the nine factors, further factors only accounted for a very small proportion of the data variance, and so were excluded.

### Cluster analysis

Once the factors had been determined, a cluster analysis was conducted.

This procedure attempts to identify relatively homogeneous groups of cases based on selected characteristics, using an algorithm that can handle large numbers of cases. The aim is to identify groups which are as different as possible to each other, while cases within a group are as similar as possible to each other.

Four different cluster solutions were examined in detail, representing solutions of between four and seven different cluster groups. In examining these solutions, an analysis of variance (ANOVA) was carried out to test the following hypothesis:

- the mean score for the factor is the same for all clusters
- there are differences in the mean score of the factor between clusters

This analysis is useful to verify whether the clusters arrived at are optimum in segmenting the sample into groups with distinctive profiles in terms of the factors derived from the factor analysis. Copies of the full analyses of variance for all four cluster solutions examined are set out below.

Below are the analyses of variance for the four-, five-, six- and seven-cluster solutions.

The column labelled 'Sig.' gives the probability of obtaining the differences observed given that the null hypothesis holds. Thus, if this is less than 0.05, then at a 5 per cent level there is significant evidence against the null, hence providing an indication that there are differences between the mean scores.

To compare between the cluster solutions, we require that the best performing set has significance probabilities all of less than 0.05. Tables for the 4-, 5-, 6-, and 7-cluster solutions below show that the 5- and 6-cluster solutions are the best performing clusters, as in all cases for these solutions the significance probabilities are zero.

## Four-cluster solution

		Sum of squares	df	Mean square	F	Sig.
REGR factor score 1 for analysis 3	Between groups	704.307	3	234.769	378.728	.000
	Within groups	1143.693	1845	.620		
	Total	1848.000	1848			
REGR factor score 2 for analysis 3	Between groups	107.473	3	35.824	37.975	.000
	Within groups	1740.527	1845	.943		
	Total	1848.000	1848			
REGR factor score 3 for analysis 3	Between groups	528.276	3	176.092	246.180	.000
	Within groups	1319.724	1845	.715		
	Total	1848.000	1848			
REGR factor score 4 for analysis 3	Between groups	422.630	3	140.877	182.351	.000
	Within groups	1425.370	1845	.773		
	Total	1848.000	1848			
REGR factor score 5 for analysis 3	Between groups	249.948	3	83.316	96.191	.000
	Within groups	1598.052	1845	.866		
	Total	1848.000	1848			
REGR factor score 6 for analysis 3	Between groups	516.527	3	172.176	238.581	.000
	Within groups	1331.473	1845	.722		
	Total	1848.000	1848			
REGR factor score 7 for analysis 3	Between groups	.745	3	.248	.248	.863
	Within groups	1847.255	1845	1.001		
	Total	1848.000	1848			
REGR factor score 8 for analysis 3	Between groups	1.831	3	.610	.610	.608
	Within groups	1846.169	1845	1.001		
	Total	1848.000	1848			
REGR factor score 9 for analysis 3	Between groups	4.320	3	1.440	1.441	.229
	Within groups	1843.680	1845	.999		
	Total	1848.000	1848			

Five-cluster solution

		Sum of squares	df	Mean square	F	Sig.
REGR factor score 1 for analysis 3	Between groups	576.061	4	144.015	208.787	.000
	Within groups	1271.939	1844	.690		
	Total	1848.000	1848			
REGR factor score 2 for analysis 3	Between groups	259.685	4	64.921	75.372	.000
	Within groups	1588.315	1844	.861		
	Total	1848.000	1848			
REGR factor score 3 for analysis 3	Between groups	282.154	4	70.538	83.069	.000
	Within groups	1565.846	1844	.849		
	Total	1848.000	1848			
REGR factor score 4 for analysis 3	Between groups	715.525	4	178.881	291.271	.000
	Within groups	1132.475	1844	.614		
	Total	1848.000	1848			
REGR factor score 5 for analysis 3	Between groups	751.018	4	187.754	315.611	.000
	Within groups	1096.982	1844	.595		
	Total	1848.000	1848			
REGR factor score 6 for analysis 3	Between groups	495.860	4	123.965	169.059	.000
	Within groups	1352.140	1844	.733		
	Total	1848.000	1848			
REGR factor score 7 for analysis 3	Between groups	109.866	4	27.467	29.140	.000
	Within groups	1738.134	1844	.943		
	Total	1848.000	1848			
REGR factor score 8 for analysis 3	Between groups	262.197	4	65.549	76.222	.000
	Within groups	1585.803	1844	.860		
	Total	1848.000	1848			
REGR factor score 9 for analysis 3	Between groups	84.233	4	21.058	22.016	.000
	Within groups	1763.767	1844	.956		
	Total	1848.000	1848			

## Six-cluster solution

Sum of squares			df	Mean square	F	Sig.
REGR factor score 1 for analysis 3	Between groups	700.709	5	140.142	225.123	.000
	Within groups	1147.291	1843	.623		
	Total	1848.000	1848			
REGR factor score 2 for analysis 3	Between groups	297.175	5	59.435	70.633	.000
	Within groups	1550.825	1843	.841		
	Total	1848.000	1848			
REGR factor score 3 for analysis 3	Between groups	79.860	5	15.972	16.648	.000
	Within groups	1768.140	1843	.959		
	Total	1848.000	1848			
REGR factor score 4 for analysis 3	Between groups	549.086	5	109.817	155.817	.000
	Within groups	1298.914	1843	.705		
	Total	1848.000	1848			
REGR factor score 5 for analysis 3	Between groups	885.916	5	177.183	339.418	.000
	Within groups	962.084	1843	.522		
	Total	1848.000	1848			
REGR factor score 6 for analysis 3	Between groups	431.296	5	86.259	112.215	.000
	Within groups	1416.704	1843	.769		
	Total	1848.000	1848			
REGR factor score 7 for analysis 3	Between groups	534.868	5	106.974	150.139	.000
	Within groups	1313.132	1843	.712		
	Total	1848.000	1848			
REGR factor score 8 for analysis 3	Between groups	525.766	5	105.153	146.568	.000
	Within groups	1322.234	1843	.717		
	Total	1848.000	1848			
REGR factor score 9 for analysis 3	Between groups	82.785	5	16.557	17.287	.000
	Within groups	1765.215	1843	.958		
	Total	1848.000	1848			

Seven-cluster solution

		Sum of squares	df	Mean square	F	Sig.
REGR factor score 1 for analysis 3	Between groups	384.408	6	64.068	80.633	.000
	Within groups	1463.592	1842	.795		
	Total	1848.000	1848			
REGR factor score 2 for analysis 3	Between groups	699.731	6	116.622	187.080	.000
	Within groups	1148.269	1842	.623		
	Total	1848.000	1848			
REGR factor score 3 for analysis 3	Between groups	318.997	6	53.166	64.050	.000
	Within groups	1529.003	1842	.830		
	Total	1848.000	1848			
REGR factor score 4 for analysis 3	Between groups	531.027	6	88.505	123.788	.000
	Within groups	1316.973	1842	.715		
	Total	1848.000	1848			
REGR factor score 5 for analysis 3	Between groups	737.973	6	122.996	204.101	.000
	Within groups	1110.027	1842	.603		
	Total	1848.000	1848			
REGR factor score 6 for analysis 3	Between groups	485.739	6	80.956	109.466	.000
	Within groups	1362.261	1842	.740		
	Total	1848.000	1848			
REGR factor score 7 for analysis 3	Between groups	1.746	6	.291	.290	.942
	Within groups	1846.254	1842	1.002		
	Total	1848.000	1848			
REGR factor score 8 for analysis 3	Between groups	8.287	6	1.381	1.383	.218
	Within groups	1839.713	1842	.999		
	Total	1848.000	1848			
REGR factor score 9 for analysis 3	Between groups	8.303	6	1.384	1.386	.217
	Within groups	1839.697	1842	.999		
	Total	1848.000	1848			

In summary, this analysis found that the five- and six-cluster solutions were better than the four- and seven-cluster solutions in terms of effectively segmenting the sample. Both the five- and six-cluster solutions were then examined in further detail, and a decision was made to opt for the six-cluster solution, principally because the groups appeared to be more clearly defined and more closely mirrored the qualitative findings.

In addition, the six-cluster solution:

- gave a manageable number of different groups
- provided groups with reasonable base sizes
- was a reasonably efficient solution in terms of minimizing the distance between the cluster group members.



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