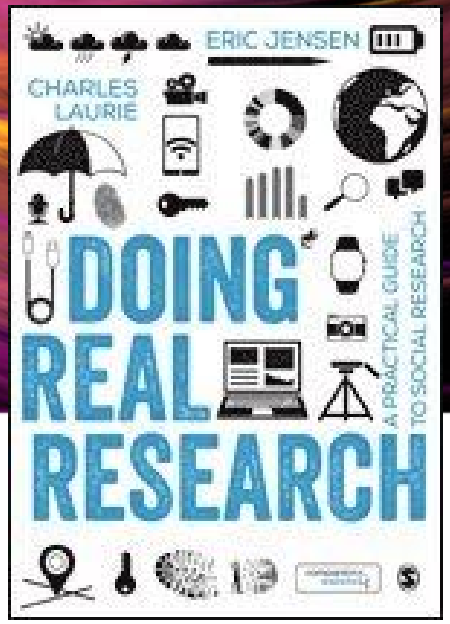
How to design impact evaluation surveys

@JensenWarwick



Dr Eric Jensen

eric@methodsinnovation.org

Background

- Academic background: communication (US), sociology (UK).
- PhD, Sociology

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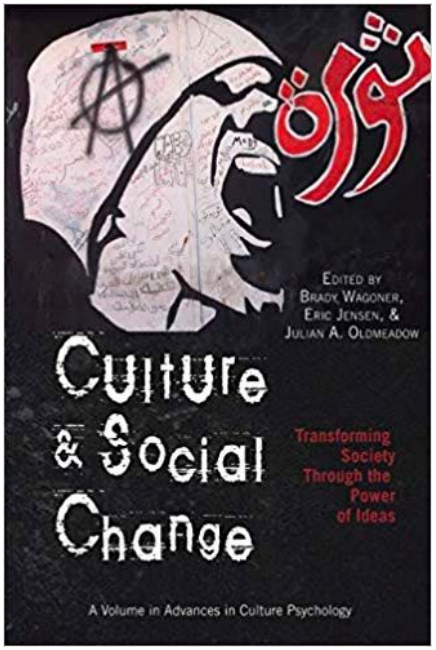

Current roles:

1) Sociology professor, University of Warwick.

   - Teaching social research methods, media audiences, founded MSc in Science, Media & Public Policy.

2) Senior Research Fellow.

   - European Commission-funded projects relating to responsible research and innovation

   (TeRRIFICA.eu; RRING.eu; GRRIP.eu; eu-project-o.eu)

100+ Engagement & Impact-related Publications

Experience

national museum wales

CHESTER ZOO

NATURAL HISTORY MUSEUM

UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF CAMBRIDGE Science Festival

THE TIMES CHELTENHAM FESTIVALS SCIENCE

CAMBRIDGE FESTIVAL OF IDEAS

THE NATIONAL GALLERY

IWM IMPERIAL WAR MUSEUMS

UNIVERSITY OF CAMBRIDGE

UNIVERSITY OF CAMBRIDGE MUSEUMS & BOTANIC GARDEN

OXFORD UNIVERSITY MUSEUM OF NATURAL HISTORY

University of Glasgow

Trinity College Dublin
The University of Dublin

UNIVERSITY OF OXFORD

SCIENCE GALLERY

SCIENCE MUSEUM GROUP

DUBLIN MAKER

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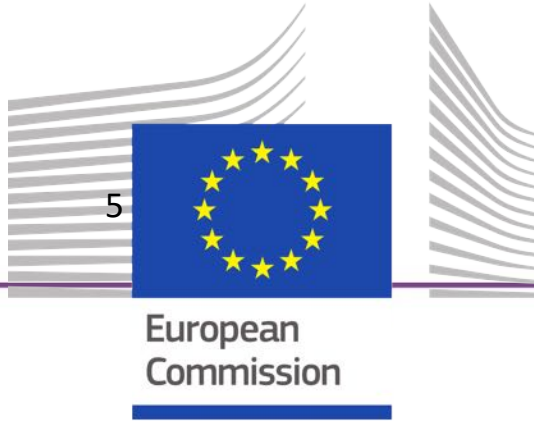
exploratorium

Experience

Australian Research Data Commons

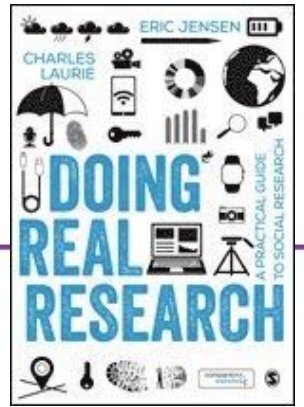
esa

European Space Agency



Why Evaluate?

- *To build* a better understanding of your visiting publics, (e.g. needs, interests, motivations, language).
- *To inform* your plans and *to predict* which engagement or learning methods and content will be most effective.
- *To know* whether you have achieved your objectives (and why or why not).
- *To re-design* your approach to be even more effective in future.




IMPACT!

Context for public engagement and non-academic research impact

Context for science engagement evaluation

Context: ***Current Approaches***

- Surveys: Feedback and Management Information
  - Usually used to measure:
    - Satisfaction
    - Comments on effectiveness of particular activities
    - Audience profile

KEY ISSUE: Representativeness of sample

Surveys: Impact Evaluation

- *Repeated measures design* (gather data from same individuals pre- and post-visit)
- *Experimental design* (requires random assignment to treatment and control groups)

Key issue with either option: Carefully avoid sources of bias and account for alternative explanations

Using Questionnaires for Evaluation

What is a questionnaire?

- Standardized method of data collection.
- Can be used for both qualitative and quantitative data.
- Used to collect data from individuals, not groups or on behalf of someone else.
- Surveys are often used for gathering information about recent actions and experiences, or current thoughts and opinions.

What are surveys good for?

- Can be used for describing patterns in a large population.
- Can determine individuals' characteristics.
- Can be used to assess general population patterns from individuals' perspectives.
- Can compare the perspectives and effects of an intervention on different sets of individuals within a population.

Using surveys for impact evaluation

What is Evaluation?

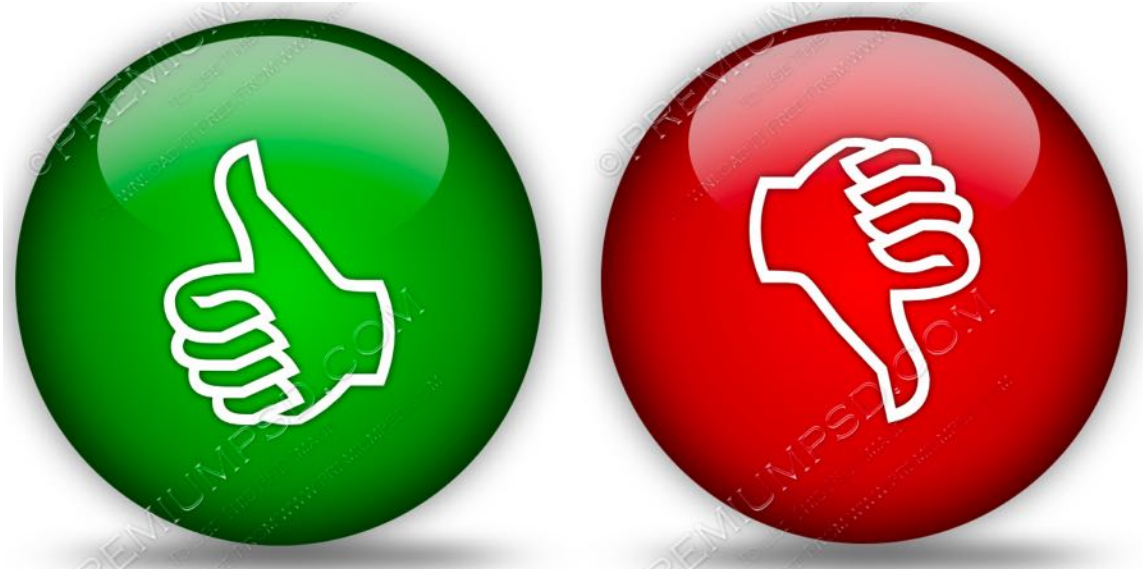
- Evaluation = sub-category of 'social research' (thus principles of good social research apply)
- Distinguishing feature of evaluation: **Focus on objectives / claimed outcomes** (*practitioners must specify these outcomes*)
- In order to evaluate them, practitioner objectives should be Specific, Measurable, Achievable, Realistic and Targeted.

Defining Impact

- Impact is the answer to…
  - What difference have you made in people's lives?
  - What ideas, relationships, interests, motivations have been transformed as a result of your intervention? (and in what ways?)

Impact Evaluation: Defining Impact

- Impact is the overall net outcomes or results of an activity (intended or unintended)
- 'Impacts' can be negative or dysfunctional!



Defining Impact

- Impacts could include:
  - development in learning
  - attitude and behaviour change
  - a greater sense of self-efficacy
  - enhanced curiosity or interest in a subject
  - improved skills
  - greater connectedness with others
  - improved understanding of self and the broader world / universe
  - improved confidence or skills, etc.

Good Impact Evaluation

- Is **SYSTEMATIC**
- Tells you **how** and **why** particular **aspects** of activity are effective

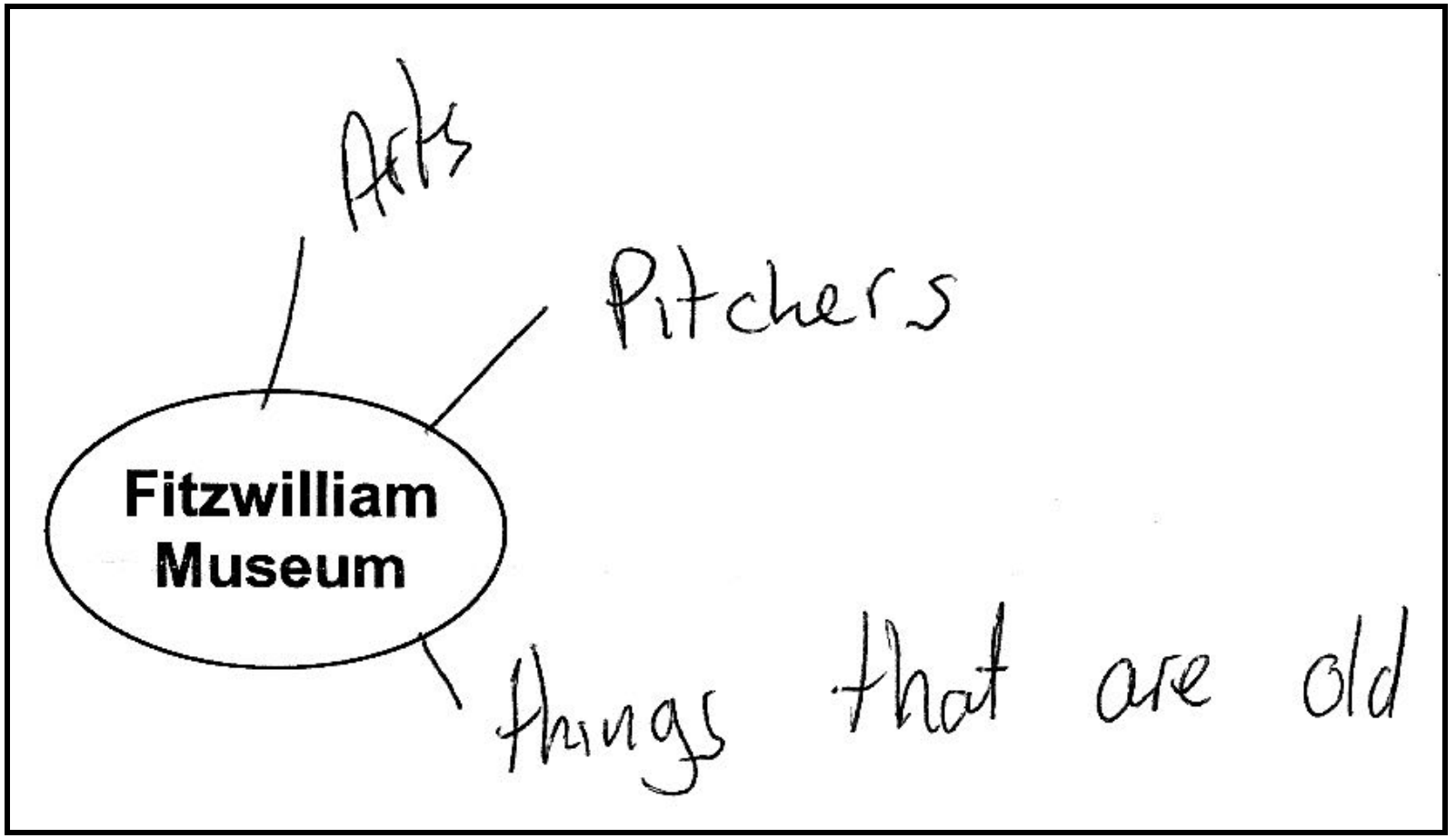
Indicators of good quantitative evaluation

- **Assumptions built into evaluation design**
- **Sampling**
- **Questionnaire Design**
  - Self-report vs. direct measures
  - Relationships between different factors: for example, was the impact pattern different across different groups?

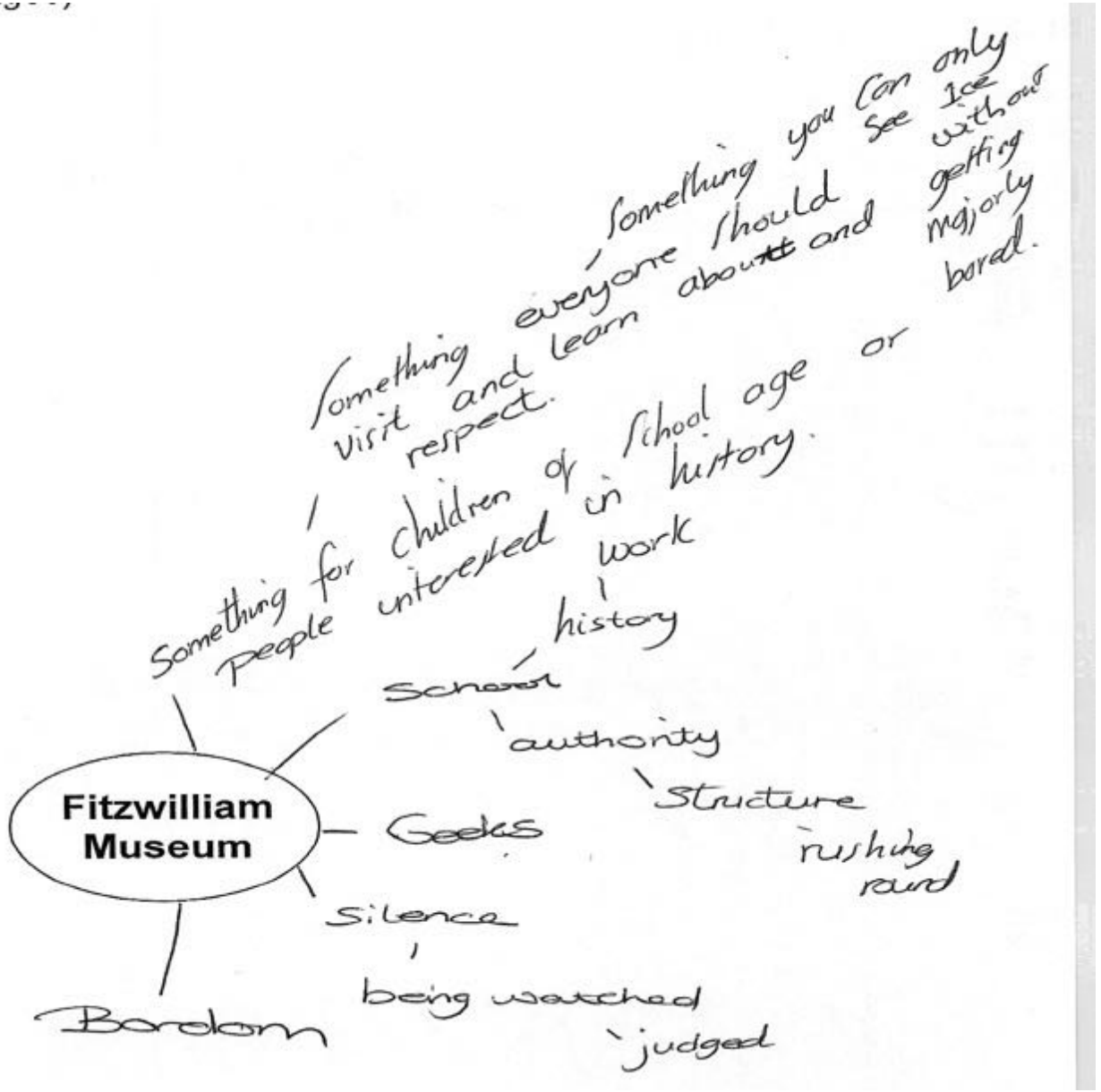
A specific example of impact evaluation using questionnaires

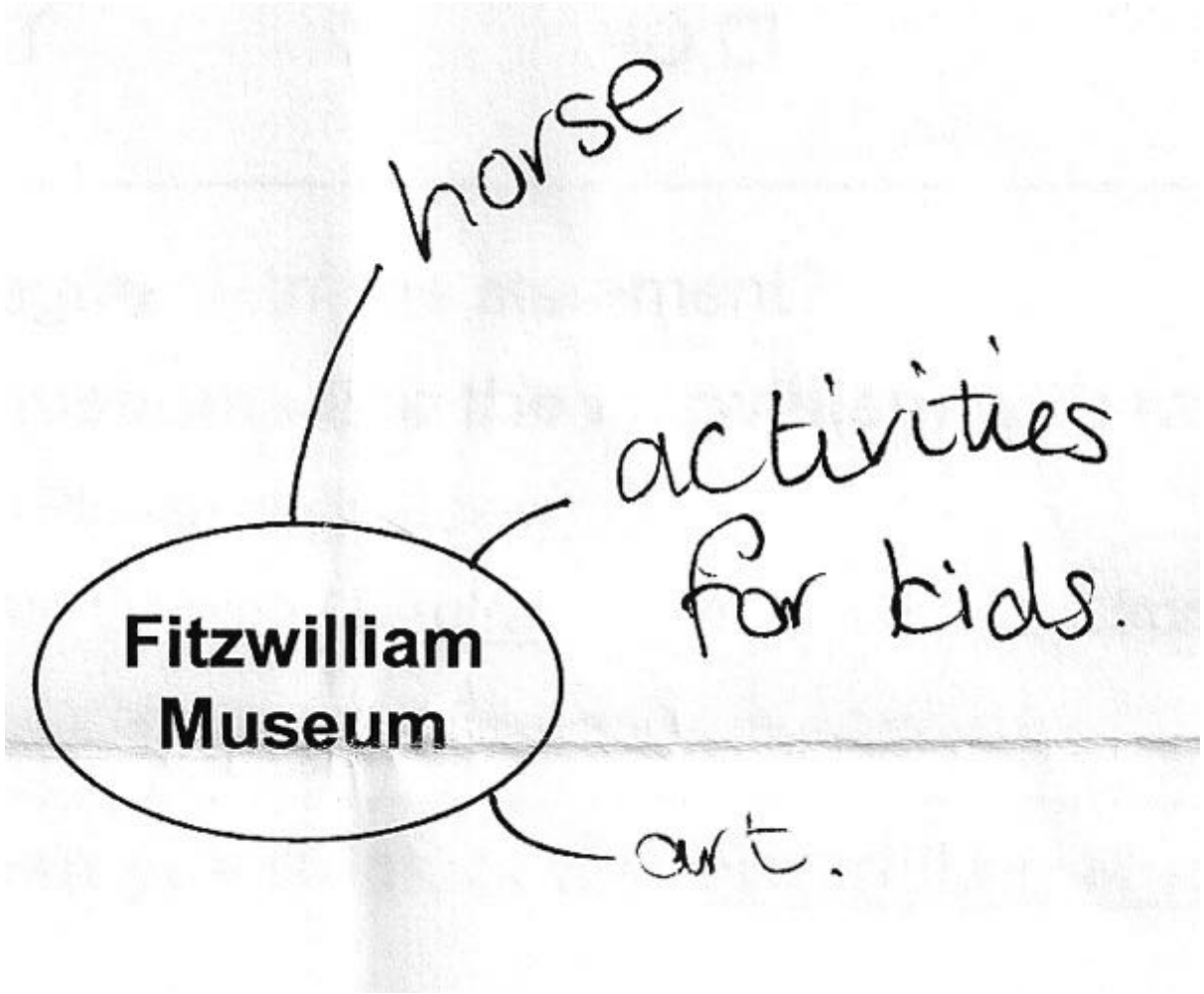
Open-ended survey data example

Pre-visit personal meaning map



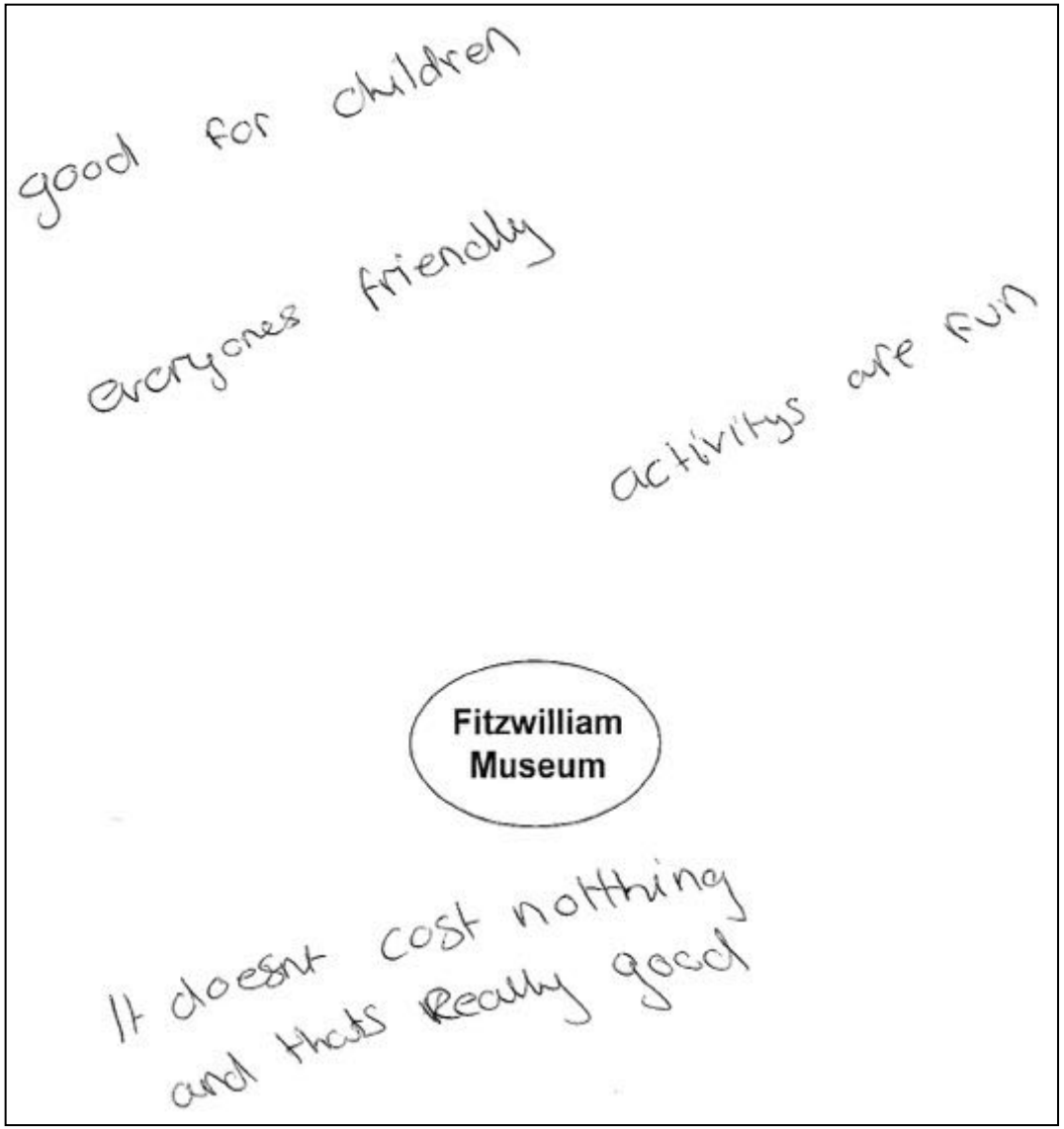
Personal meaning map




horse
activities for kids.
Fitzwilliam Museum
art.

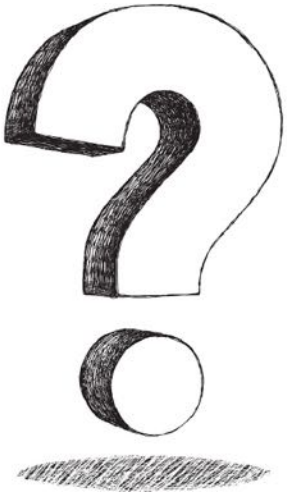

welcoming
fun activities for myself & my child
Fitzwilliam Museum
Bright
educational

Post-visit


good for children
everyones friendly
activitys are fun
Fitzwilliam Museum
It doesnt cost nothing and thats Really good

Over to you! (concept map)

1) Design a concept map survey question focusing on the outcome you identified.
2) How would you analyse the data you collect?

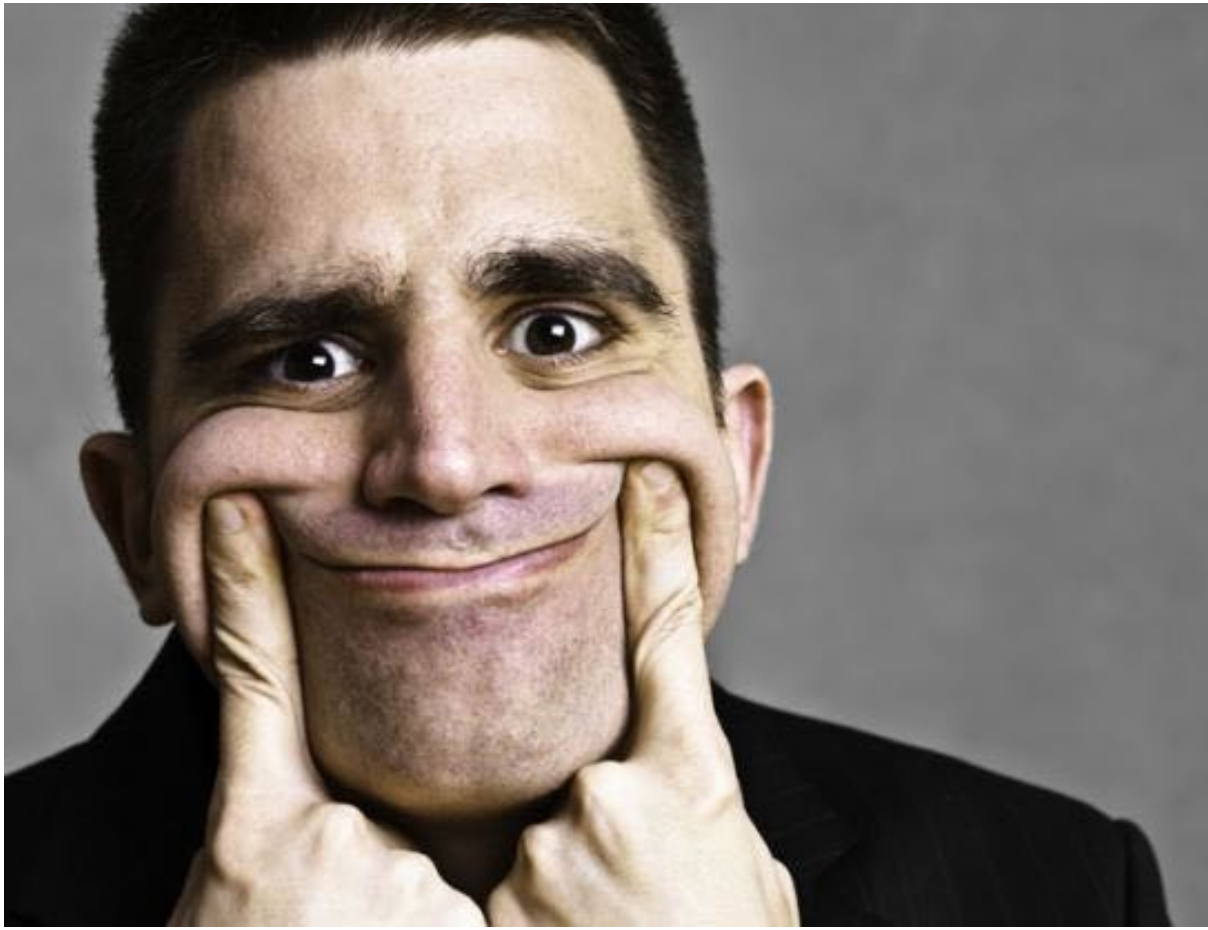


Surveys should be understandable

- Survey questions and instructions should be clear.
- Jargon and complicated wording should be avoided.
- Response categories should generally offer a 'don't know' option:
  - Without a 'don't know' option, respondents may provide inaccurate guesses or select a survey response that does not match their true views.

Unintended Cues can Influence Responses

- Cues that you give to respondents can affect the opinions and thoughts they report.
- Be careful not to influence responses by accidentally hinting about your expected outcomes, etc.



Unintended Cues

- Unintended cues can be imbedded in:
  - the way questions are written,
  - survey layout,
  - whether other people are nearby with a verbally administered survey,
  - who is collecting the data,
  - what data collectors are wearing, etc.

Response Categories

- Unclear questions or confusing response options may result in respondents:
  - Guessing.
  - Selecting a ‘neutral’/‘don’t know’ option.
  - Not answering the question.
- Pilot-testing will help reduce this:
  - Ask test respondents for feedback (any feedback is better than nothing).
  - Use feedback to refine questions.
  - Repeat if necessary.

- **QUESTION DESIGN**

How to write your survey

Question Design

- When designing your survey questions you need to decide:
  - The overall focus of your questions.
  - The type of question response.
  - The content and phrasing of your questions.

Question Types

- There are a broad range of question types than be used in survey design:
  - Open-ended
  - Classification or demographic
  - Ranked response
  - Multiple choice
    - ‘Select one’ vs. ‘Select all that apply’
  - Likert scale

Classification and Demographic Questions

- Gathers objective characteristics of respondents:
  - Gender, ethnicity, religious affiliation.
- Can be asked in different forms:
  - E.g. Age can be an open-ended question, a multiple-choice question or be assessed by enquiring about the date or birth.

Multiple-choice questions: Select one response

- This question type provides pre-determined response options: Respondents must choose one answer.
- Key criteria for this question type is that response options should be:
  - Exhaustive: everyone fits into at least one category.
  - Exclusive: everyone fits into only one category.
  - Unambiguous: response categories mean the same to everyone.

Likert scale questions

- This question type should be used when the outcome being evaluated has multiple levels:
  - E.g. levels of agreement, concern, confidence etc.
- The scale should always have a neutral option:
  - E.g. Strongly agree, agree, neutral, disagree, strongly disagree (also a ‘don’t know’/’no opinion’, etc.).

Likert scale questions

Science engagement indicators [Impact Measures]	7. Please indicate your level of agreement with the following statements:	Likert scale	Strongly Disagree (1) to Strongly Agree (7) and Prefer not to say or no opinion
*Scientific self-efficacy **[Impact Measure]***	*I feel capable of understanding science.*		
*Degree of science interest (reverse) **[Impact Measure]***	*Science is boring.*		

Problems of the Response Process

- When designing your questions, you should consider things that can go wrong.
- Respondents could:
  - misinterpret the question.
  - guess what the question response options mean.

Avoiding Survey Bias

- Using a biased survey reduces the reliability and validity or your survey research.
- You should try to avoid the various forms of bias when designing your survey:
  - Editing, getting feedback and pilot testing are essential to reducing survey bias.

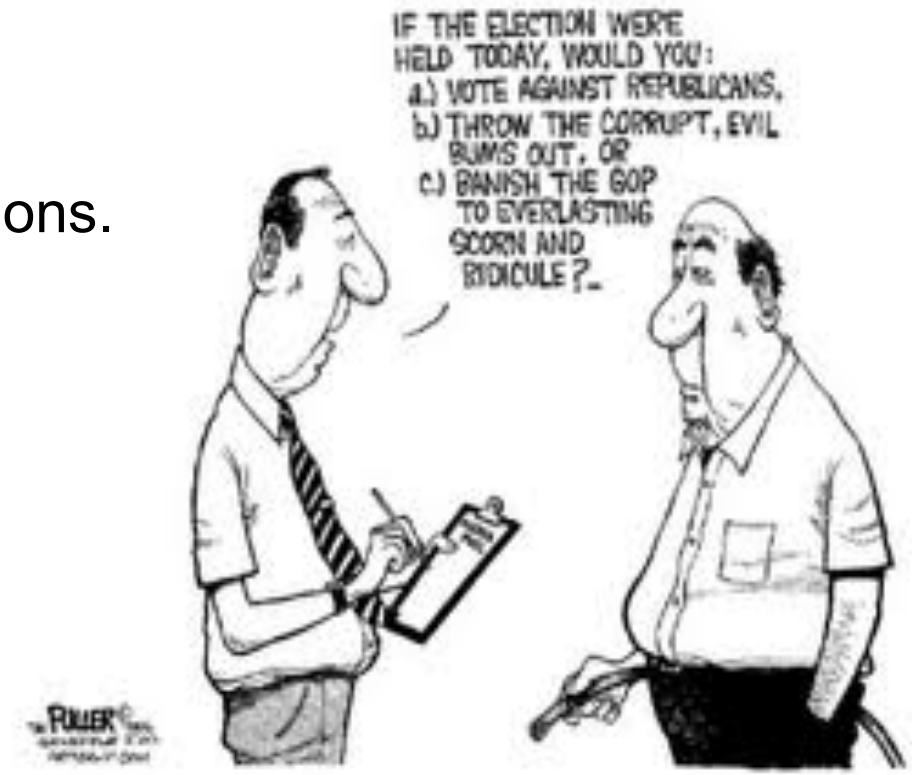
Type of Bias	What is it	Example
Researcher Expectancy Effect	Researchers unintentionally introduce bias by designing survey questions and response options around their existing assumptions.	A business's customer service team expecting positive feedback might unintentionally bias their survey by asking leading questions.
Acquiescence Bias	Respondents tend to agree with Likert scale (level of agreement) statements.	If all such Likert scale statements are framed positively, the results may skew towards agreement.
Demand Characteristics	Respondents may alter their answers based on what they think is the researcher's preferred result.	Being asked to give feedback about a hospital by a uniformed hospital worker may result in more positive responses.
Social Desirability Bias	Respondents may over-report views and behaviours that are widely praised in society and to make themselves look better.	Inaccurately reporting higher levels of recycling or charitable donations in order to appear more caring is typical of this bias.

Table adapted from 'Types of Survey Bias to Avoid' from *Doing Real Research by Jensen, E. and Laurie, C. (SAGE, 2014).*

Survey Design Flaws (Avoid!)

- **Demand Characteristics**: Participants will alter their responses in accordance with what they believe to be the evaluators' expected results.
  - ➢ This can happen when questions make the expected outcome clear, or other cues give away researchers' expectations.
- **Expectancy effect**:

When evaluators unintentionally bias results in accordance with expected results.
(e.g. by asking biased questions)



Survey Design Flaws (Avoid!) continued

- Acquiescence Bias: A bias from respondents' tendency to agree with statements

→ Control for this by including reverse wording items on agreement scales

(e.g. 'I found the presentation confusing')

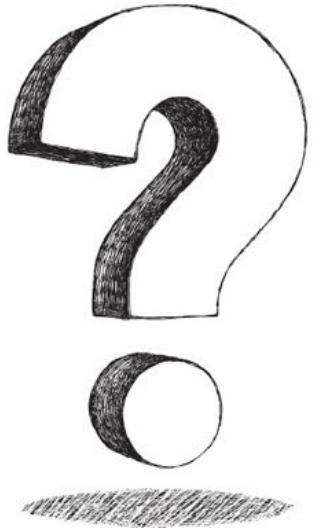
"Put me down for whoever comes out ahead in your poll".

Survey Design Flaws

- Beware of social desirability bias
- Phrase questions e.g. about their prior knowledge or visiting experience in a way that respondents can answer truthfully without feeling stigmatized or awkward.
  - e.g. '*sure, I read all the information signs*'.

"Let's see...number of cheeseburgers eaten in a typical month? three...no, I'll put down four."

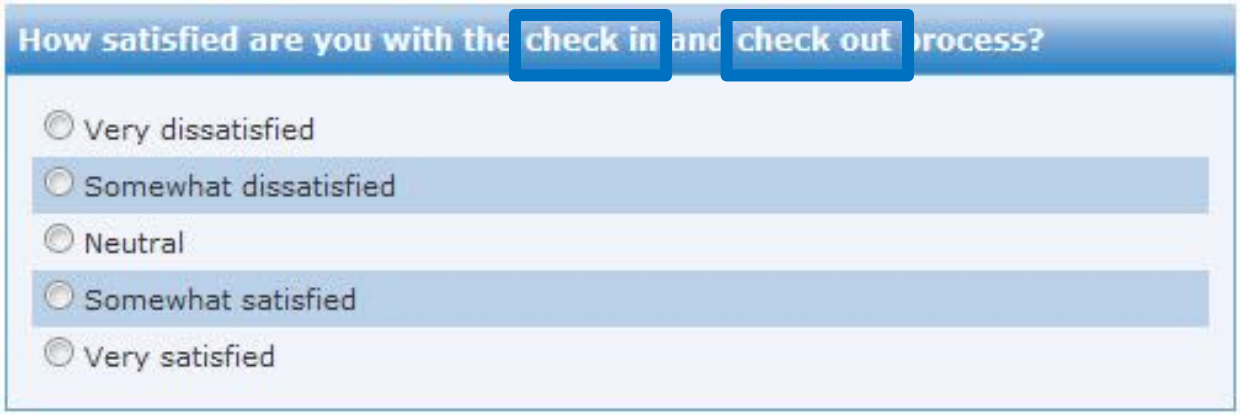
Further Survey Biases to avoid: Double-barrelled questions



How much do you like
milk & **carrot juice**
in your tea?

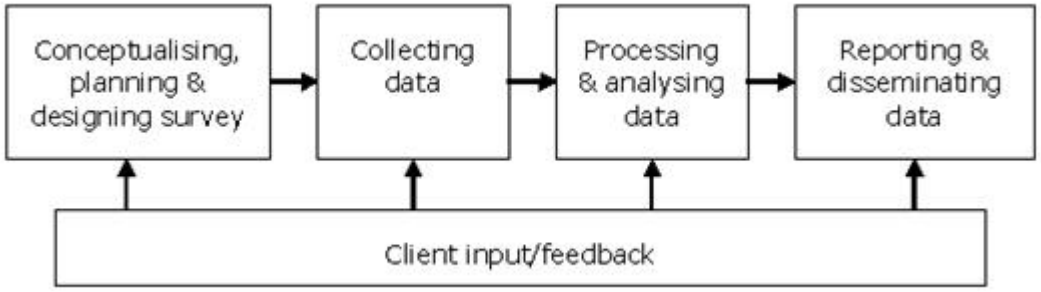
Further Survey Biases to avoid

- Double-barrelled questions, 2 questions in 1:
  - May have 2 different answers.



Further Survey Biases to avoid

- Asking unrealistic questions:
  - Only ask questions it is realistic to expect your sample to know the answer to.
- Getting someone experienced to give feedback is beneficial to your research.



Survey Biases from Self-Report

- Many surveys ask respondents to 'self-report' information about events, beliefs or attitudes.
- Self-report allows for direct access to respondents' views.
- However, self-report can be a source of bias:
  - Report is only ever a representation of the event.
  - If they are asked to report on behalf of someone else.
  - If they are expected to recall unrealistic information.
  - If they are expecting to predict future behaviour.

Tips for good survey design

- Label each of the response options you use to increase reliability (e.g. 1 – Strongly disagree, 2 – Disagree, 3 – Somewhat disagree, etc.)
- Don’t ask about events in the distant past if you want accurate recall
- Use your respondents’ language wherever possible

Important Tips to Remember

- For survey questions, consider:
  - Neutrality
  - Clarity and simplicity
  - Specificity
  - Brevity
  - Using single questions (not double-barrelled)
- Try and use some sort of pilot testing.

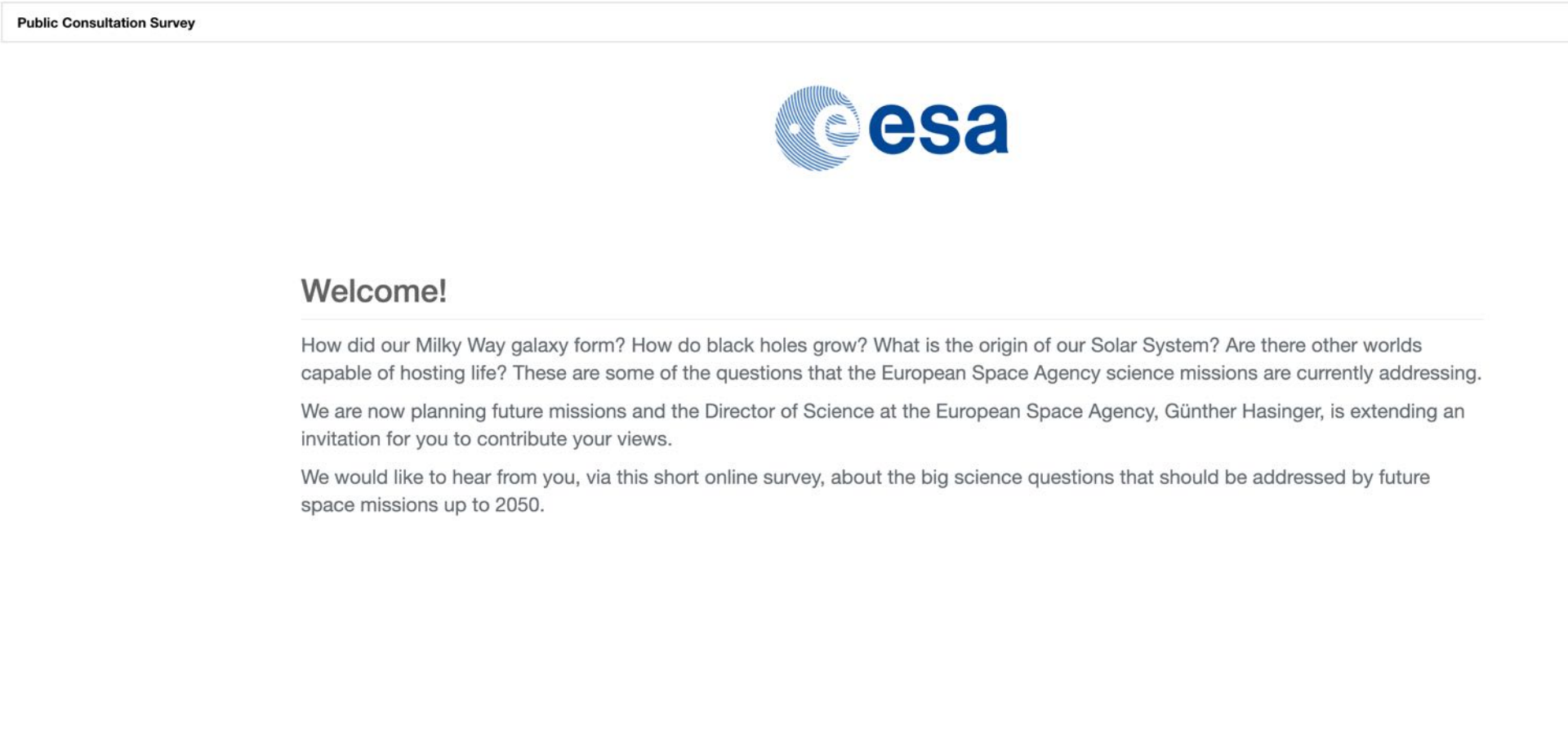
SUMMARY

- A survey is standardized method of collecting data from **individuals**.
- Survey design is a complicated process involving careful consideration, editing and refinement.
- The process will involve many important decisions.
- Questions should be varied in type and avoid mistakes and biases.
- Good to have standard data collection procedures.
- Electronic devices can be used to conduct surveys.

Example: Different types of closed-ended survey questions

ESA public consultation survey

- Survey welcome & GDPR compliance



Survey welcome & GDPR compliance

Participation in this survey

The following information will help to inform you about why you are being asked to complete this questionnaire and what happens to the information you provide. You'll be asked to provide your explicit consent below.

As a "Thank You" for completing this survey, you will be given the opportunity to enter a prize draw for a gift voucher to the value of €100.

How much time is needed to participate?

You will be asked to complete a questionnaire in full after you provide your consent on this page to participate. This questionnaire should take you about 10 minutes to complete. However, you may withdraw from participating in this consultation at any time, for any reason.

What happens to the information you provide?

Providing your consent to participate in this survey means that your responses will only be used for research and evaluation purposes, to understand your views relating to space science and on the European Space Agency's science programme.

If you have any questions or concerns relating to your participation in this survey or would like to withdraw your consent after having completed the survey, please contact survey@methodsinnovation.org.

GDPR compliance

Agreement to Participate

Please read the following statements below:

- I confirm I am 16 years of age or older.
- I understand that my responses to the following survey will be anonymously stored and used for research and evaluation purposes only.
- I understand the information I provide about myself is confidential. My identity will not be disclosed for commercial use by a third party or made public without my explicit consent.
- I understand that my participation is voluntary, and I can withdraw at any time.
- At the end of this survey, I will be given the opportunity to provide personally identifiable information to the European Space Agency (i.e., name and contact information). By doing so, I understand I can revoke my consent at any time and have all information I supplied deleted. Further, I understand that if I do not provide this information, there will be no means by which to identify my responses.
- I agree I have received adequate information about my participation in this survey and understand what will happen to the information I provide.

Please indicate whether you understand the information provided above, that you agree with the statements above, and that you are willing to participate in this survey:*

☐ *Yes,* I understand, agree, and am willing to participate in this survey.

If you would like clarification about any of the information above before starting, or if you have difficulties completing this form, please email survey@methodsinnovation.org.

Likert-type scales (agreement)

Using the response options below, please indicate the extent to which you agree or disagree with each of the statements.

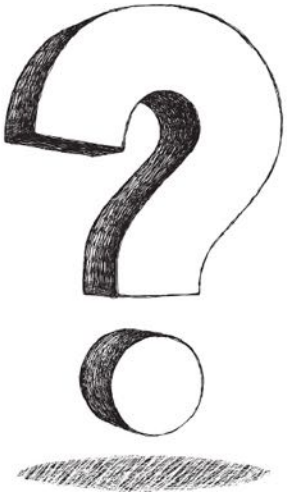
	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree	Not applicable / No Opinion
Space research is a priority for me.	○	○	○	○	○	○	○	○
Space research should be a priority for my generation.	○	○	○	○	○	○	○	○
I have a good understanding of *space*.	○	○	○	○	○	○	○	○
Scientific research should be a priority for my generation.	○	○	○	○	○	○	○	○
I follow *space* stories in the news.	○	○	○	○	○	○	○	○
Scientific research is a priority for me.	○	○	○	○	○	○	○	○
I am able to understand *science*.	○	○	○	○	○	○	○	○

Over to you!

Design a closed-ended survey question focusing on the outcome you identified

Using the response options below, please indicate the extent to which you agree or disagree with each of the statements.

	Strongly Disagree	Disagree	Somewhat Disagree	Neutral	Somewhat Agree	Agree	Strongly Agree		Not applicable / No Opinion



Example: Different types of closed-ended survey questions

Semantic differential

For each pair of words below, please select the point between them that you think best describes **SPACE SCIENCE**.

I think **SPACE SCIENCE** is...

	3	2	1	0	1	2	3	
Uninteresting	○	○	○	○	○	○	○	Interesting
Good	○	○	○	○	○	○	○	Bad
Relevant	○	○	○	○	○	○	○	Irrelevant
Unappealing	○	○	○	○	○	○	○	Appealing
	3	2	1	0	1	2	3	
Essential	○	○	○	○	○	○	○	Unnecessary
Disappointing	○	○	○	○	○	○	○	Satisfying
Useless	○	○	○	○	○	○	○	Useful
Boring	○	○	○	○	○	○	○	Fascinating

Semantic differential

	3	2	1	0	1	2	3	
Stimulating	○	○	○	○	○	○	○	Dull
Valuable	○	○	○	○	○	○	○	Worthless
Mundane	○	○	○	○	○	○	○	Exciting
Unimportant	○	○	○	○	○	○	○	Important

Getting physical exercise every day is…

	3	2	1	0	1	2	3	
Bad	○	○	○	○	○	○	○	Good
Healthy	○	○	○	○	○	○	○	Unhealthy
Boring	○	○	○	○	○	○	○	Fun
Easy	○	○	○	○	○	○	○	Hard

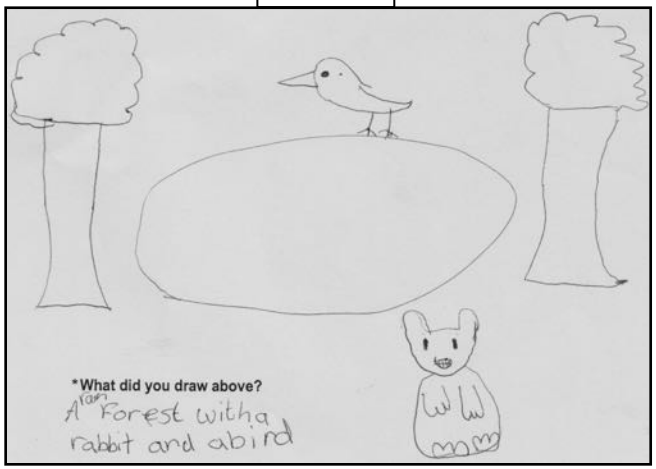
Over to you! (semantic differential)

Design a closed-ended survey question focusing on the outcome you identified

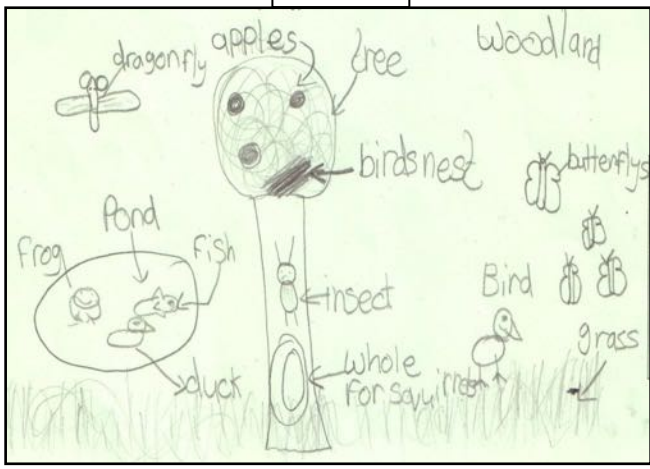
	3	2	1	0	1	2	3	
Stimulating	○	○	○	○	○	○	○	Dull
Valuable	○	○	○	○	○	○	○	Worthless
Mundane	○	○	○	○	○	○	○	Exciting
Unimportant	○	○	○	○	○	○	○	Important

Impact Evaluation examples

BEFORE

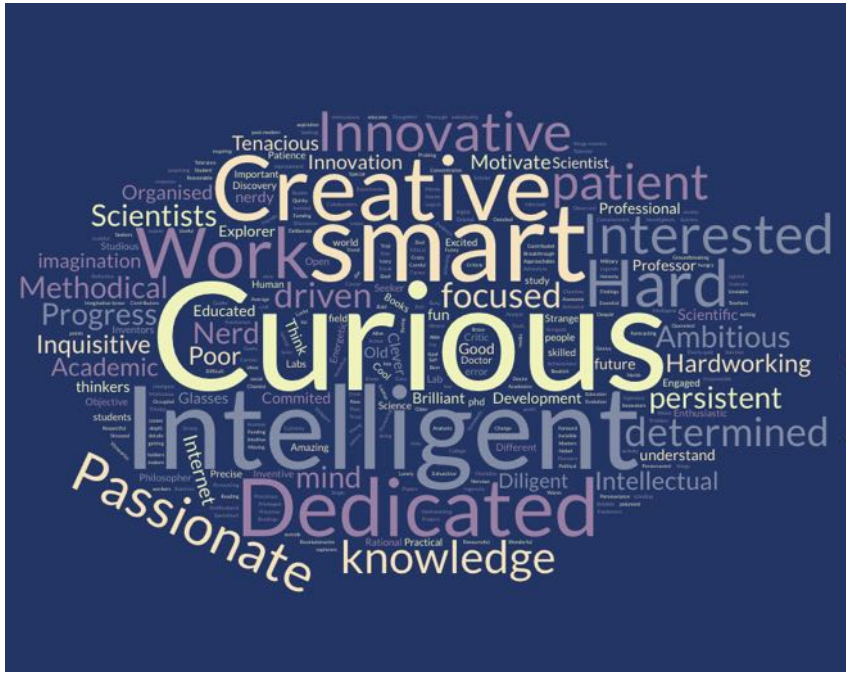


AFTER



‘What comes to mind when you think of researchers?’ (Ireland)

PRE



POST

Positive indicators for attendees

PracticalEvaluation.tips

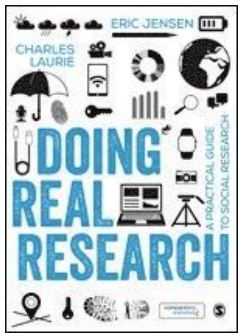
PracticalEvaluation.tips

UNIVERSITY OF CAMBRIDGE MUSEUMS & BOTANIC GARDEN

THE NATIONAL GALLERY

Arts & Humanities Research Council

WARWICK



Current projects:
TeRRIFICA.eu; RRING.eu;
GRRIP.eu; eu-project-o.eu

perform

The Art of Science Learning

perform-research.eu

eric@methodsinnovation.org

Learn more about impact evaluation tools:

methodsinnovation.org

practicalevaluation.tips