

Research Bias





Research Bias

- Research bias results from any deviation from the truth, causing distorted results and wrong conclusions.
- Bias can occur at any phase of your research, including during data collection, data analysis, interpretation, or publication.
- Research bias can occur in both qualitative and quantitative research.

Research Bias

Understanding research bias is important for several reasons:

1. Bias exists in all research, across research designs, and is difficult to eliminate.
2. Bias can occur at any stage of the research process.
3. Bias impacts the validity and reliability of your findings, leading to misinterpretation of data.

It is almost impossible to conduct a study without some degree of research bias. It's crucial for you to be aware of the potential types of bias, so you can minimise them.



Actor — Observer Bias

Actor–observer bias occurs when you attribute the behaviour of others to internal factors, like skill or personality, but attribute your own behaviour to external or situational factors.

Actor – Observer Bias

Scenario:

A project manager (the "observer") notices that a construction worker (the "actor") failed to complete a task on time, such as laying the foundation for a building.



Actor – Observer Bias

Actor-Observer Bias in Action:

Observer's Perspective (Project Manager):

Actor's Perspective (Construction Worker):



Actor – Observer Bias

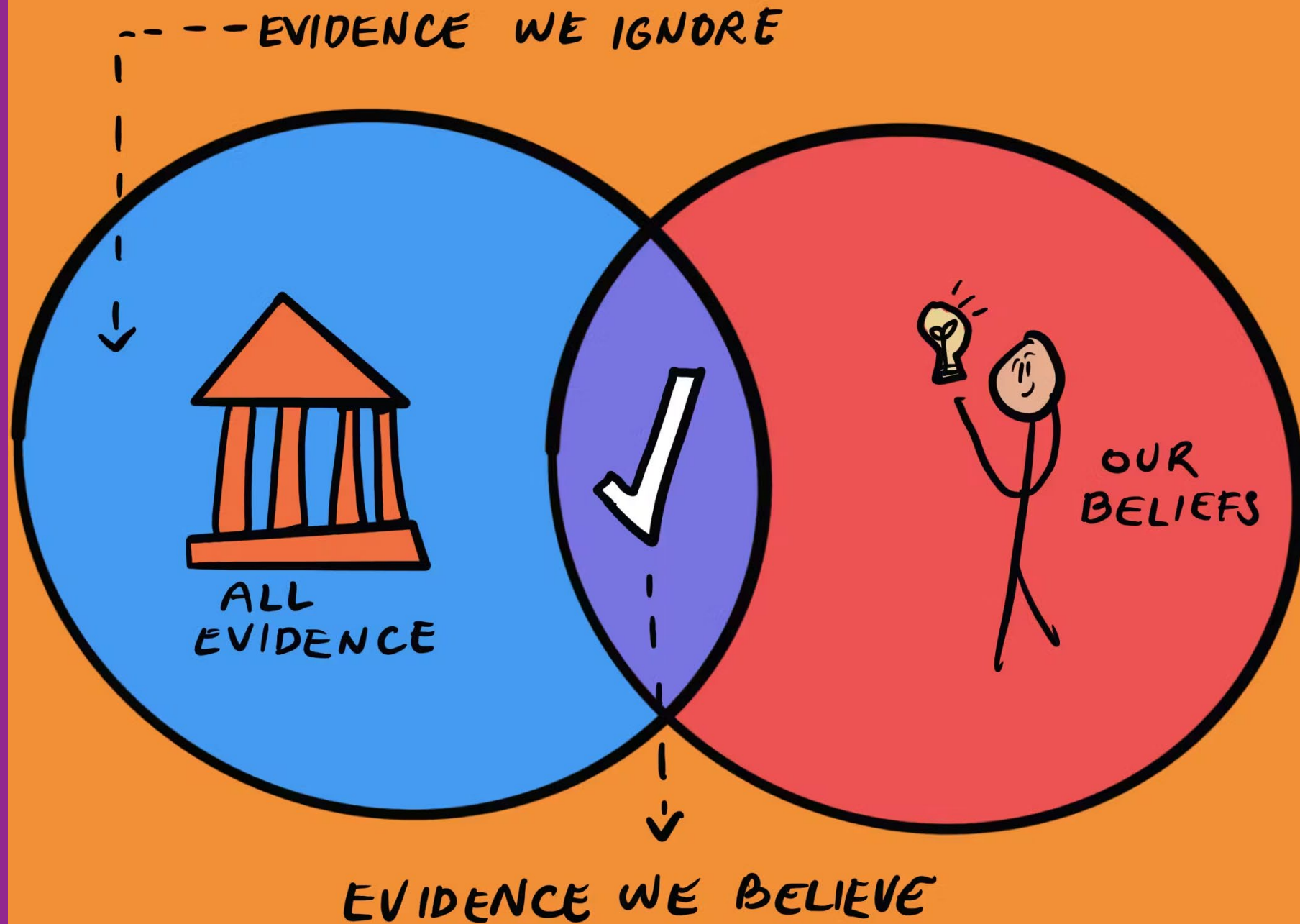
Actor-Observer Bias in Action:

Observer's Perspective (Project Manager): The project manager attributes the delay to the worker's personal traits, such as laziness, lack of competence, or poor time management.

Actor's Perspective (Construction Worker): The construction worker attributes the delay to external factors beyond their control, such as bad weather, equipment failure, or receiving unclear instructions.

Confirmation Bias

Confirmation bias is the tendency to seek out information in a way that supports our existing beliefs while also rejecting any information that contradicts those beliefs.



Confirmation Bias

Scenario:

A construction project manager has a preconceived belief that a particular subcontractor is unreliable based on past experiences or hearsay.



Confirmation Bias

Confirmation Bias in Action:

Selective Attention to Evidence:

Ignoring Contradictory Evidence:

Interpreting Ambiguous Events to Fit Beliefs:



Confirmation Bias

Confirmation Bias in Action:

Selective Attention to Evidence: The project manager notices and remembers instances where the subcontractor delivered work late or made mistakes, reinforcing their belief.

Ignoring Contradictory Evidence: The project manager overlooks instances where the subcontractor completed tasks on time or exceeded expectations.

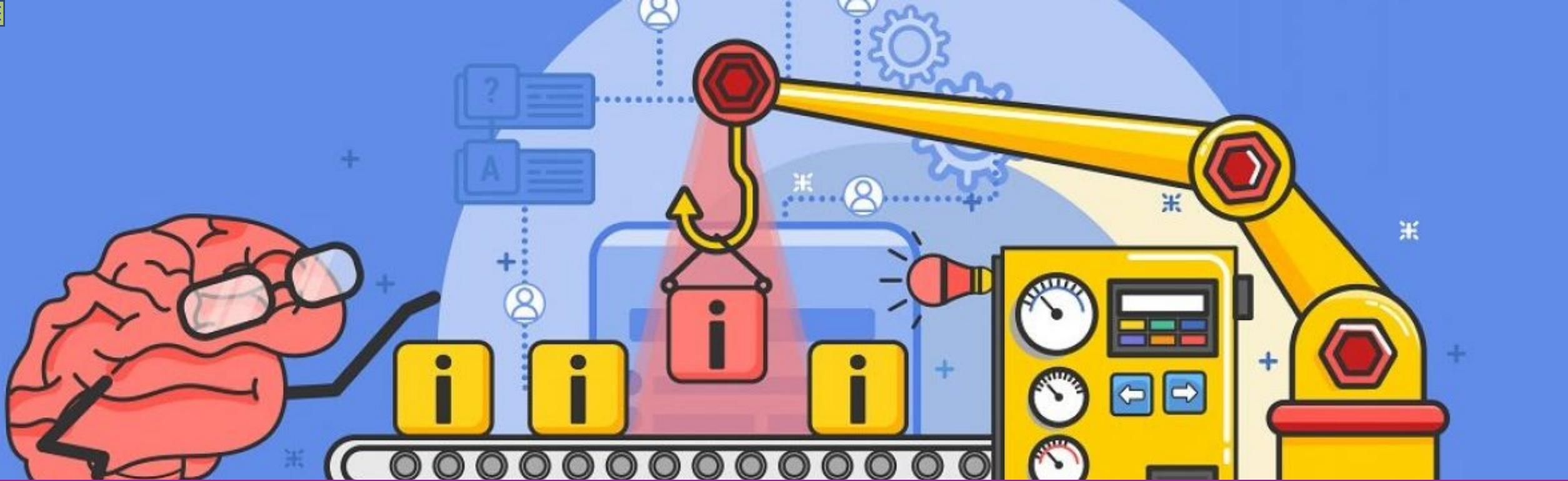
Interpreting Ambiguous Events to Fit Beliefs: If the subcontractor requests clarification on project specifications, the manager interprets this as incompetence rather than diligence.



Confirmation Bias

How can you mitigate confirmation bias?

- Gather Objective Data
- Seek Diverse Perspectives
- Challenge Assumptions



Information Bias

Information bias, also called measurement bias, arises when key study variables are inaccurately measured or classified.

Information Bias

Scenario:

A research team is studying the factors that influence project delays in the construction industry. They collect extensive data on a wide range of variables, including weather patterns, worker productivity, material availability, equipment efficiency, site conditions, and even minor variables like the colour of hard hats worn on-site.



Information Bias

Information Bias in Action:

Collecting Excessive Information:

Focussing on Irrelevant Data:

Diluting Key Findings:



Information Bias

Information Bias in Action:

Collecting Excessive Information: The researchers gather data on every conceivable variable, believing that more information will lead to better insights.

Focussing on Irrelevant Data: The team spends time analysing trivial data, like hard hat colours, that have no logical connection to project delays, distracting from meaningful factors such as weather or material shortages.

Diluting Key Findings: The volume of unnecessary data complicates the analysis, making it harder to identify the critical causes of delays.



Information Bias

How can you mitigate information bias?

- Define Clear Objectives
- Use Theoretical Frameworks
- Prioritise Data Quality Over Quantity
- Streamline Analysis

Recall Bias

Recall bias is a type of information bias. It occurs when respondents are asked to recall events in the past and is common in studies that involve self-reporting.



Recall Bias

Scenario:

Researchers are conducting a study to identify the causes of workplace injuries in the construction industry. They rely on interviews and self-reported data from workers who have experienced or witnessed incidents.



Recall Bias

Recall Bias in Action:

Incomplete / Inaccurate Memories:

Selective Memory:

Over / Under Reporting:



Recall Bias

Recall Bias in Action:

Incomplete / Inaccurate Memories: Workers may fail to recall the details of the incident accurately, especially if the event occurred months or years ago.

Selective Memory: Workers may emphasise certain aspects of the incident that stood out to them, such as blaming equipment failure, while neglecting their own potential contribution (e.g., not following safety protocols).

Over / Under Reporting: Workers might exaggerate the severity of hazards or downplay their own risky behaviours due to fear of judgment or a desire to justify their actions.



Recall Bias

How can you mitigate recall bias?

- Use Objective Data
- Collect Data Soon After Incidents
- Standardise Data Collection Tools
- Triangulate Data



Observer Bias

Observer bias is the tendency of research participants to see what they expect or want to see, rather than what is occurring.

Observer Bias

Scenario:

A safety inspector is conducting an on-site evaluation of worker compliance with safety protocols on a construction site as part of a study to assess adherence to industry safety standards.



Observer Bias

Observer Bias in Action:

Preconceived Notions:

Selective Attention:

Recording Bias:



Observer Bias

Observer Bias in Action:

Preconceived Notions: The inspector believes that workers in a particular company are generally careless and non-compliant with safety regulations due to the company's previous poor safety record.

Selective Attention: The inspector may unconsciously focus on instances of non-compliance (e.g., a worker not wearing a hardhat) while overlooking compliance behaviours (e.g., workers correctly using fall protection systems).

Recording Bias: The inspector might describe non-compliance in more detail while giving only cursory attention to observations of compliance.



Observer Bias

How can you mitigate observer bias?

- Blinding
- Standardised Observational Protocols
- Multiple Observers
- Video Recording

Interviewer Bias

Interviewer bias stems from the person conducting the research study. It can result from the way they ask questions or react to responses.



Interviewer Bias

Scenario:

A research team is conducting interviews with construction workers to study job satisfaction and the impact of safety protocols on their work experience.



Interviewer Bias

Interviewer Bias in Action:

Leading Questions:

Non-Verbal Cues:

Selective Probing:

Bias in Recording Responses:



Interviewer Bias

Interviewer Bias in Action:

Leading Questions: The interviewer unintentionally frames questions in a way that suggests a preferred response.

Non-Verbal Cues: The interviewer's body language, tone of voice, or facial expressions show approval or disapproval, subtly pressuring respondents to provide specific answers.

Selective Probing: The interviewer asks follow-up questions only for responses that align with their expectations or hypotheses, neglecting alternative perspectives.

Bias in Recording Responses: The interviewer paraphrases responses in a way that aligns with their preconceptions.



Interviewer Bias

How can you mitigate interviewer bias?

- Standardised Questionnaires
- Training Interviewers
- Blind Interviews
- Audio or Video Recording

Researcher Bias

Researcher bias occurs when the researcher's beliefs or expectations influence the research design or data collection process.



Researcher Bias

Scenario:

A researcher is conducting a study to assess the effectiveness of a new safety training program in reducing workplace accidents on construction sites. The researcher has previously worked with the company that developed the program and believes strongly in its success.



Researcher Bias

Researcher Bias in Action:

Hypothesis Confirmation:

Selective Reporting:

Interpretation Bias:



Researcher Bias

Researcher Bias in Action:

Hypothesis Confirmation: The researcher has a preconceived belief that the new safety training program is effective. As a result, they may give more weight to data that supports the program's success and overlook or dismiss data that suggests it has little effect on accident rates.

Selective Reporting: The researcher focuses on positive outcomes (e.g., fewer accidents) and minimises or excludes negative findings (e.g., workers' dissatisfaction with the training or difficulties in implementing it).

Interpretation Bias: The researcher interprets ambiguous data in a way that fits their expectations. For instance, if there is a slight drop in accident rates after the training, they may interpret this as evidence of success, even if the drop is not statistically significant.



Researcher Bias

How can you mitigate researcher bias?

- Blinding
- Pre-registration of Hypotheses
- Use of Objective Measures
- Peer Review and Third-Party Evaluation
- Transparent Reporting



Response Bias

Response bias is a general term used to describe several different situations where respondents tend to provide inaccurate or false answers to questions

Response Bias

Scenario:

A researcher is conducting a survey to assess worker satisfaction with new safety protocols on a construction site. The survey includes questions about the perceived effectiveness of safety measures, comfort, and the level of training provided.



Response Bias

Response Bias in Action:

Social Desirability Bias:

Acquiescence Bias:

Framing Effect:



Response Bias

Response Bias in Action:

Social Desirability Bias: Workers may provide answers that they believe are more socially acceptable or expected, rather than their true feelings. For instance, they might report that they feel safe and well-trained to avoid appearing negligent or uncooperative.

Acquiescence Bias: Workers may tend to agree with statements or questions, especially when they are unsure, to avoid conflict or to make the survey process easier. This could lead to over-reporting of positive sentiments about safety protocols.

Framing Effect: The way questions are framed can influence workers' responses. If the survey is worded to highlight the positive aspects of the safety protocols, workers may be more likely to rate the protocols favourably, even if they have reservations.



Response Bias

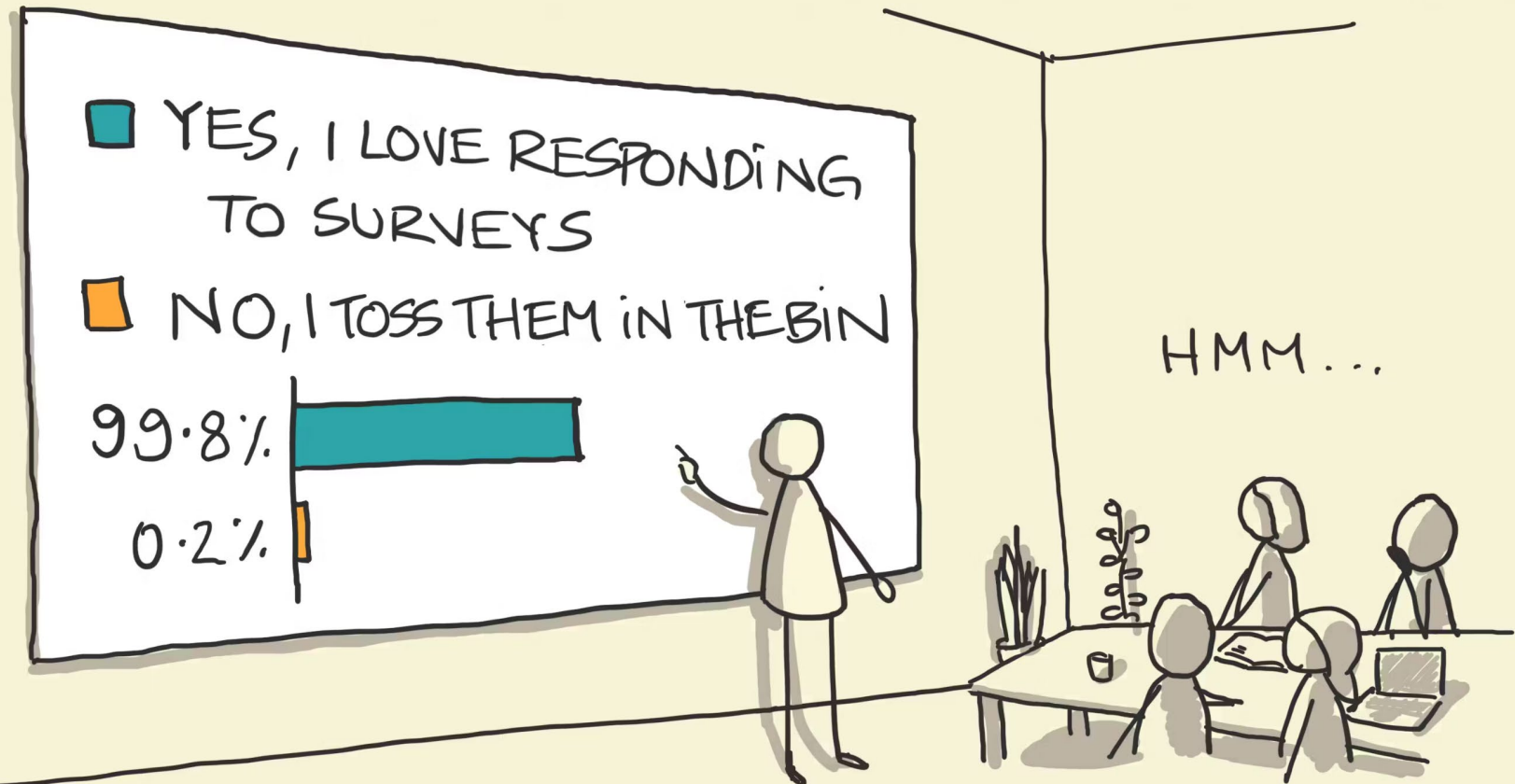
How can you mitigate response bias?

- Anonymous Surveys
- Neutral Question Design
- Multiple Methods of Data Collection
- Provide a Range of Response Options
- Emphasise Honest Feedback

Sampling Bias

Sampling bias occurs when your sample (the individuals, groups, or data you obtain for your research) is selected in a way that is not representative of the population you are analysing.

SAMPLING BIAS



" WE RECEIVED 500 RESPONSES AND FOUND THAT PEOPLE LOVE RESPONDING TO SURVEYS "

Sampling Bias

Scenario:

A researcher is studying job satisfaction among construction workers to identify factors that improve retention rates. The study involves surveying workers from several construction sites.



Sampling Bias

Sampling Bias in Action:

Convenience Bias:

Time Bias:

Self-Selection Bias:



Sampling Bias

Sampling Bias in Action:

Convenience Bias: The researcher selects participants who are easily accessible, such as workers available during breaks at a single site, rather than ensuring a representative sample across different job roles, locations, and project sizes.

Time Bias: The researcher conducts the survey during a specific shift, such as the daytime shift, ignoring workers on night shifts or weekend schedules.

Self-Selection Bias: Participation in the survey is voluntary, and workers who are dissatisfied or have strong opinions are more likely to respond than those who are neutral or content.



Sampling Bias

How can you mitigate sampling bias?

- Random Sampling
- Stratified Sampling
- Include Diverse Sites and Roles
- Expand Accessibility

How to avoid bias

- While very difficult to eliminate entirely, research bias can be mitigated through proper study design and implementation.
- Here are some tips to keep in mind as you get started:

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Clearly explain in your methodology section how your research design will help you meet the research objectives and why this is the most appropriate research design.

How to avoid bias

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In quantitative studies, make sure that you use probability sampling to select the participants.

How to avoid bias

- While very difficult to eliminate entirely, research bias can be mitigated through proper study design and implementation.
- Here are some tips to keep in mind as you get started:

Phrase your survey or interview questions in a neutral, non-judgemental tone. Be very careful that your questions do not steer your participants in any direction.

How to avoid bias

- While very difficult to eliminate entirely, research bias can be mitigated through proper study design and implementation.
- Here are some tips to keep in mind as you get started:

Consider using a reflexive journal. Here, you can log the details of each interview, paying special attention to any influence you may have had on participants. You can include these in your final analysis.