Data Collection

- Observational -- Self-report -- Trace Data Collection
- Primary vs. Archival Data
- Data Collection Settings
- Data Integrity
  - Experimenter expectancy effects
  - Participant Expectancy Effects
  - Single- and Double-blind designs
  - Effects of attrition on initial equivalence

All data are collected using one of three major methods...

Behavioral Observation Data
- Studies actual behavior of participants
- Can require elaborate data collection & coding techniques
- Quality of data can depend upon secrecy (naturalistic, disguised participant) or rapport (habituation or desensitization)

Self-Report Data
- Allows us to learn about non-public “behavior” – thoughts, feelings, intentions, personality, etc.
- Added structure/completeness of prepared set of ?s
- Participation & data quality/honesty dependent upon rapport

Trace Data
- Limited to studying behaviors that do leave a “trace”
- Least susceptible to participant dishonesty
- Can require elaborate data collection & coding techniques

Behavioral Observation Data Collection
It is useful to discriminate among different types of observation ...

Naturalistic Observation
- Participants don’t know that they are being observed
  - requires “camouflage” or “distance”
  - researchers can be VERY creative & committed !!!!

Participant Observation (which has two types)
- Participants know “someone” is there – researcher is a participant in the situation
  - Undisguised
    - the “someone” is an observer who is in plain view
    - Maybe the participant knows they’re collecting data…
  - Disguised
    - the observer looks like “someone who belongs there”
Naturalistic Observation

Advantages & Possibilities
- Probably offers the best external validity
- Participants don’t know they are being observed, and so, “act naturally”
- Experimental or nonexperimental designs can be used
  • RA and Manip can require creativity – but are possible!

Disadvantages & Challenges
- Limited to studying behavior
- Important ethical point → Limited to the observation of “public behaviors”
- Requires reliable/accurate coding to produce useful data

Undisguised Participant Observation

Advantages & Possibilities
- Behavior can be very “natural” after participants are “used to the observer”
  • Habituation -- observer shows up and waits until participant “gets used to” observer and then begins data collection
  • Desensitization -- observer slowly approaches so participant can gradually “get used to” them
- Experimental or nonexperimental designs can be used
  • RA and Manip can require creativity – but are possible!

Disadvantages & Challenges
- Limited to studying behavior
- Important ethical point → Limited to the observation of “public behaviors”
- Some behaviors/participants don’t habituate/desensitize
- Requires reliable/accurate coding to produce useful data

Oops! Observing behavior without changing that behavior is more difficult than we thought!
Disguised Participant Observation

Advantages & Possibilities
– The participant doesn’t know they are being observed, and so, they should “act naturally”
  • access to “less public” behavior “among peers”
– Disguised researcher could change behavior of participants
– Experimental or nonexperimental designs can be used
  • RA and Manip can require creativity – but are possible!

Disadvantages & Challenges
– Limited to studying behavior
– Important ethical point → Researcher is now “intruding” and must be careful about privacy/risk issues!
– Participation can cause loss of “objectivity” or be dangerous
– Requires reliable/accurate coding to produce useful data

How we collect the observational data …
Although “written narratives,” “field notes,” and “checklists” were the standards of observational data collection for decades, we now usually use various kinds of instrumentation to record observational data, including…
• Audio recordings
• Pictures and video recordings
• Non-verbal behaviors – reaction time (RT), eye movements
• Medical/physiological recordings – EEG, EKG, EMG, GSR, MRI & PET scans, hormone levels

Instrumentation increases the availability & accuracy of the data…
• Audio/video recordings are more accurate than written records
• Computerized RT are more accurate than stopwatches
• Physiological recordings of “unseen” body processes

Self-Report Data Collection

We need to discriminate among various self-report data collection procedures…

• Mail Questionnaire
• Computerized Questionnaire
• Group-administered Questionnaire
• Personal Interview
• Phone Interview
• Group Interview (focus group)
• Journal/Diary

In each of these participants respond to a series of questions prepared by the researcher.
Self-Report Data Collection

Advantages & Possibilities
- can get data about “non-observables” or “mental behavior”
  • thoughts, opinions, attitudes, intentions, plans, etc.
- Experimental or nonexperimental designs can be used
  • RA and Manip are readily possible!

Disadvantages & Challenges
- Dependent upon accuracy and honesty of the participant
- Ways to improve response honesty
  • Promises of anonymity and/or confidentiality
  • Rapport between researcher and participant
- Ways to improve response accuracy
  • Careful construction of questions and their sequence

Trace data are data collected from the “marks & remains left behind” by the behavior we are trying to measure.

There are two major types of trace data...
Accretion – when behavior “adds something” to the environment
  • trash, noseprints, graffiti
Deletion – when behaviors “wears away” the environment
  • wear of steps or walkways, “shiny places”

Advantages –
• “unobtrusive measures” – much like naturalistic observation
• seldom “modified” or “biased” on purpose

Disadvantages –
• subject to “differential deposit” & “differential retention” (can’t be sure that nothing has modified the trace)
• limited range of behaviors leave a durable trace

A famous example of trace-based research began the study of Garbageology – the scientific study of society based on what it discards -- its garbage !!!
- Researchers looking at family eating habits used a questionnaire to collect data from several thousand families about how often families ate take-out food
- Responses suggested that people ate take-out food about 1.3 times per week
- These data seemed “at odds” with economic data obtained from fast food restaurants, which suggest more like 3 times per week
- The Solution – they dug through the trash of several hundred families’ garbage cans before pick-up for 3 weeks – suggested about 2.8 take-out meals eaten each week

This is a good example of the use of “multimethod” data collection – as part of programmatic research to provide convergent evidence
Data Sources …
It is useful to discriminate between two kinds of data sources…

Primary Data Sources
– Sampling, questions and data collection completed for the purpose of this specific research
– Researcher has maximal control of planning and completion of the study – substantial time and costs

Archival Data Sources (AKA secondary analysis)
– Sampling, questions and data collection completed for some previous research, or as standard practice
– Data that are later made available to the researcher for secondary analysis
– Often quicker and less expensive, but not always the data you would have collected if you had greater control.

Is each primary or archival data?
• Collect data to compare the outcome of those patients I’ve treated using Behavior vs. using Cognitive interventions
• Go through past patient records to compare Behavior vs. Cognitive interventions
• Purchase copies of sales receipts from a store to explore shopping patterns
• Ask shoppers what they bought to explore shopping patterns
• Using the data from some else’s research to conduct a pilot study for your own research
• Using a database available from the web to perform your own research analyses
• Collecting new survey data using the web

Data collection Settings
Same thing we discussed as an element of external validity…
Any time we collect data, we have to collect it somewhere – there are three general categories of settings

Field
• Usually defined as “where the participants naturally behave”
• Helps external validity, but can make control (internal validity) more difficult (RA and Manip possible with some creativity)

Laboratory
• Helps with control (internal validity) but can make external validity more difficult (remember ecological validity?)

Structured Setting
• A “natural appearing” setting that promotes “natural behavior” while increasing opportunity for “control”
• An attempt to blend the best attributes of Field and Laboratory settings !!!
Data collection Settings identify each as laboratory, field or structured...

- Study of turtle food preference conducted in Salt Creek.
- Study of turtle food preference conducted with turtles in 10 gallon tanks.
- Study of turtle food preference conducted in a 13,000 gallon “cement pond” with natural plants, soil, rocks, etc.
- Study of jury decision making conducted in 74 Burnett, having participants read a trial transcript.
- Study of jury decision making with mock juries conducted in the mock trial room at the Law College.
- Study of jury decision making conducted with real jurors at the Court Building.

Experimenter Expectancy Effects
A kind of “self-fulfilling prophesy” during which researchers unintentionally “produce the results they want”. Two kinds...

Modifying Participants’ Behavior
- Subtle differences in treatment of participants in different conditions can change their behavior...
- Inadvertently conveying response expectancies/research hypotheses
- Difference in performance due to differential quality of instruction or friendliness of the interaction

Data Collection Bias (much like observer bias)
- Many types of observational and self-report data need to be “coded” or “interpreted” before they can be analyzed
- Subjectivity and error can creep into these interpretations – usually leading to data that are biased toward expectations

Data Collection Bias: Observer Bias & Interviewer Bias
Both of these are versions of “seeing what you want to see”

Observer Bias is the term commonly used when talking about observational data collection
- Both observational data collection and data coding need to be done objectively and accurately
- Automation & instrumentation help – so does using multiple observers/coders and looking for consistency

Interviewer Bias is the term commonly used when talking about self-report data collection
- How questions are asked by interviewers or the interviewers’ reactions to answers can drive response bias
- More of a challenge with face-to-face interviews
- Computerized and paper-based procedures help limit this
Participant Expectancy Effects
A kind of “demand characteristic” during which participants modify their behavior to respond/conform to “how they should act”.

Social Desirability
– When participants intentionally or unintentionally modify their behavior to match “how they are expected to behave”
– Well-known social psychological phenomenon that usually happens between individual’s and their “peer group”
– Can also happen between researcher and participants

Acquiescence/Rejection Response
– If participant thinks they know the research hypothesis or know the behavior that is expected of them they can “try to play along” (acquiescence) or “try to mess things up” (rejection response)
– Particularly important during within-groups designs – if participants think study is “trying to change their behavior”

Participant Expectancy Effects: Reactivity & Response Bias
Both of these refer to getting “less than accurate” data from the participants

Reactivity is the term commonly used when talking about observational data collection
– the participant may behave “not naturally” if they know they are being observed or are part of a study
– Naturalistic & disguised participant observation methods are intended to avoid this
– Habituation and desensitization help when using undisguised participant observation

Response Bias is the term commonly used when talking about self-report data collection and describes a situation in which the participant responds how they think they “should”
– The response might be a reaction to cues the researcher provides
– Social Desirability is when participants describe their character, opinions or behavior as they think they “should” or to present a certain impression of themselves
– Protecting participants’ anonymity and participant-researcher rapport are intended to increase the honesty of participant responses

Data collection biases & inaccuracies -- summary

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<tr>
<th>Type of Data Collection</th>
<th>Observational</th>
<th>Self-report</th>
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<tr>
<td>Observer Bias</td>
<td>“inaccurate data recording/coding”</td>
<td>“coaching” or “inaccurate recording/coding”</td>
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<td>Reactivity</td>
<td>“reacting” to being observed</td>
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<td>Interviewer Bias</td>
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Single & Double-blind Procedures
One way to limit or minimize the various biasing effects we've discussed is to limit the information everybody involved has.

In **Single Blind Procedures** the participant doesn't know the hypotheses, the other conditions in the study, and ideally, the particular condition they are in (i.e., we don’t tell how the task or manipulation is designed to change their behavior).

In **Double-blind Procedures** neither the participant nor the data collector/data coder knows the hypotheses or other information that could bias the interaction/reporting/coding of the researcher or the responses of the participants.

Sometimes this simply can’t be done (especially the researcher-blind part) because of the nature of the variables or the hypotheses involved (e.g., hard to hide the gender of a participant from the researcher who is coding the video tape).

Attrition – also known as drop-out, data loss, response refusal, & experimental mortality

**Attrition endangers initial equivalence of subject variables**
- random assignment is intended to produce initial equivalence of subject variables – so that the groups (IV conditions) have equivalent means on all subject variables (e.g., age, gender, motivation, prior experience, intelligence, topical knowledge, etc.)
- attrition can disrupt the initial equivalence – producing inequalities
- “differential attrition” – related to IV condition differences – is particularly likely to produce inequalities
  - e.g., If one condition is “harder” and so more participants drop out of that condition, there is likely to be a “motivation” difference between the participants remaining in the two conditions (i.e., those remaining in the harder condition are more motivated).

So, “attrition” works much like “self assignment” to trash initial equivalence

Both involve a non-random determination of who provides data for what condition of the study!

Imagine a study that involves a “standard treatment” and an “experimental treatment”…
- random assignment would be used to ensure that the participants in the two groups are equivalent
- self-assignment is likely to produce non-equivalence (different “kinds” of folks likely to elect the different treatments)
- attrition (i.e., rejecting the randomly assigned condition) is similarly likely to produce non-equivalence (different “kinds” of folks likely to remain in the different treatments)