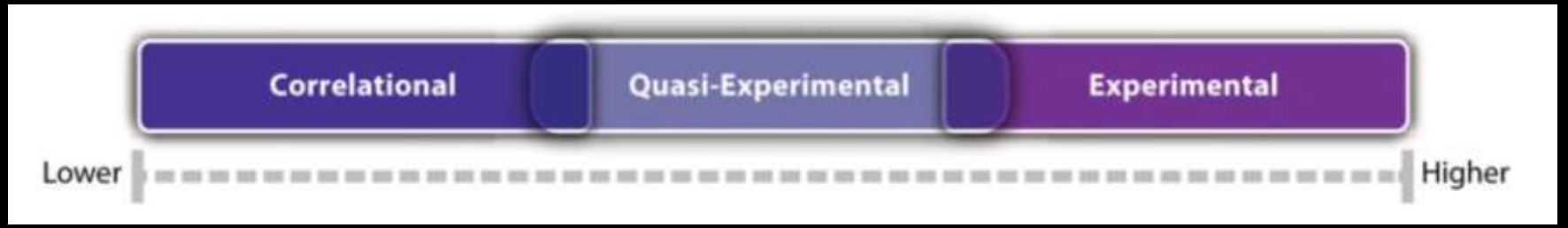
Non-experimental research (Correlations, observations, qualitative research)

pp. 145-160; 164-180

Overview

- When are experiments <u>not</u> feasible?
  - Interested in non-causal relationships
  - Variables are not manipulated due to practical/ethical reasons
  - Exploratory research questions
- Cannot describe **cause → effect** relations (cannot *explain* – only *describe* and *predict*)
- Consists of **correlational, qualitative** and **observational** studies



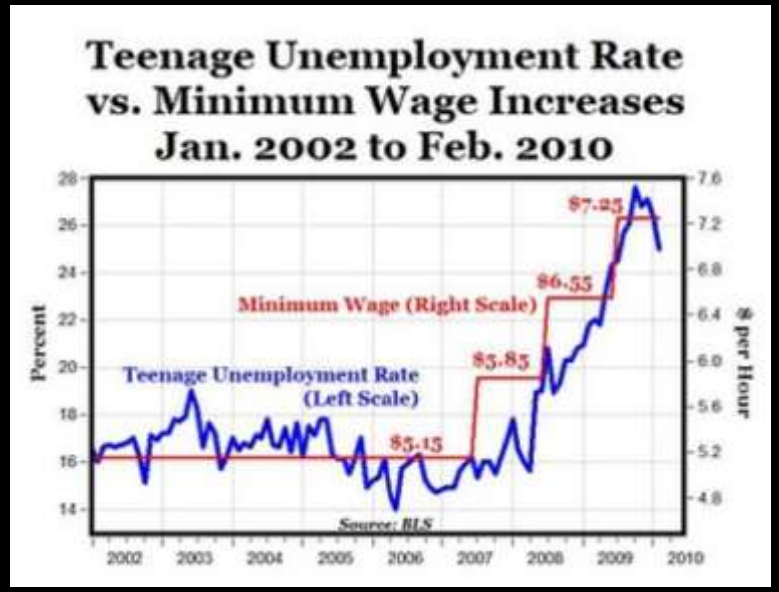
Non-experimental designs

1. **Cross-sectional design** (contrast pre-existing groups that differ along some criterion variable – e.g., *children during different development stages*)
   Limitation: *Cohort effects* (group differences other than target variable – e.g., different nutritional histories)
2. **Longitudinal design** (follow your sample over an extended period of time as they age – e.g., *effects of pre-natal exposure to a suspected carcinogen*) Limitation: Expensive and time-consuming
3. Cross-sequential (combine features of both approaches)

Correlations

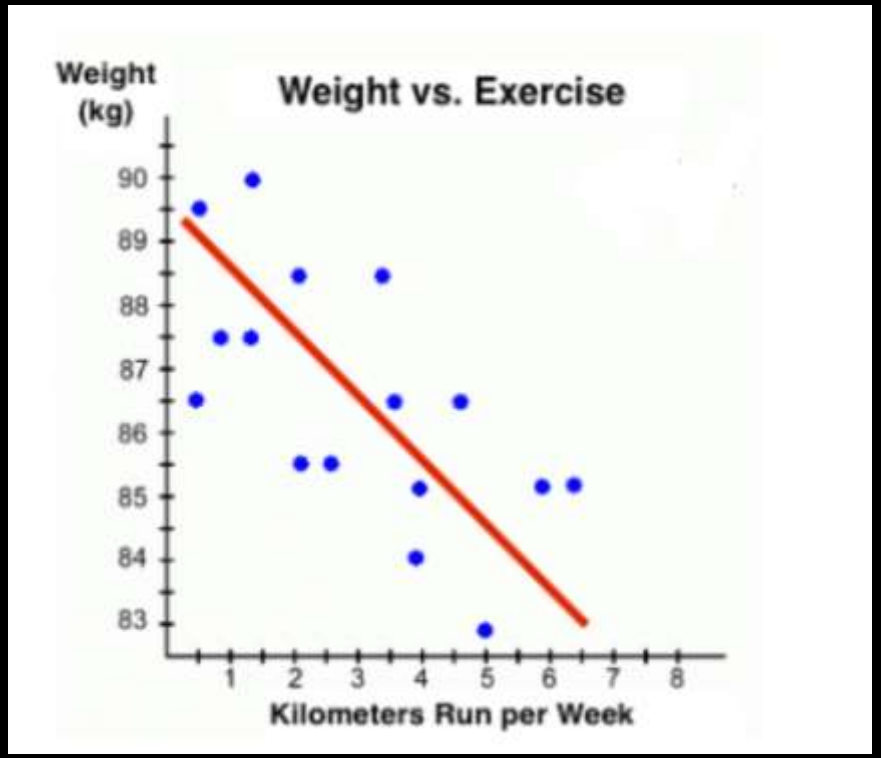
- Are two variables **associated**?
  - What is the **direction** of the association (positive/negative?)
  - What is the **strength** of the association (-1 < 0 < 1)?
- Cannot be used to identify **causes** (but can give you a good idea what they may be)
- Low to moderate **internal validity** but typically **higher external validity**
- Let's look at some examples of correlations…

- Minimum wage increases are *positively* correlated with teenage (low-skilled worker) unemployment rates



Source: pointsandfigures

- Running (exercise) is *negatively* correlated with weight gain



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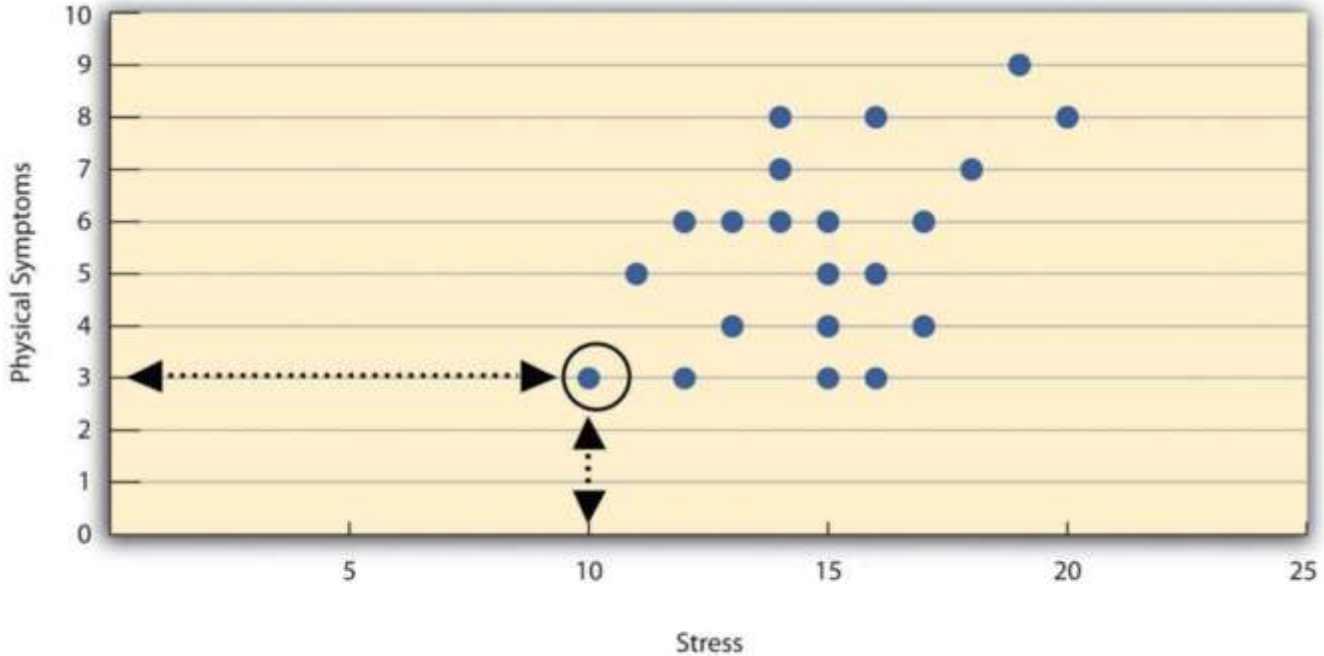


Figure 6.3 Scatterplot Showing a Hypothetical Positive Relationship Between Stress and Number of Physical Symptoms. The circled point represents a person whose stress score was 10 and who had three physical symptoms. Pearson's r for these data is +.51.

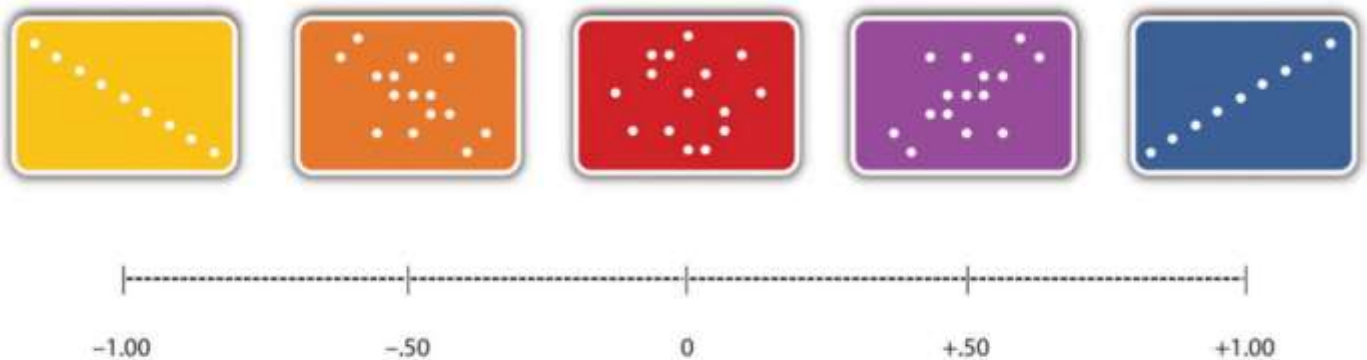
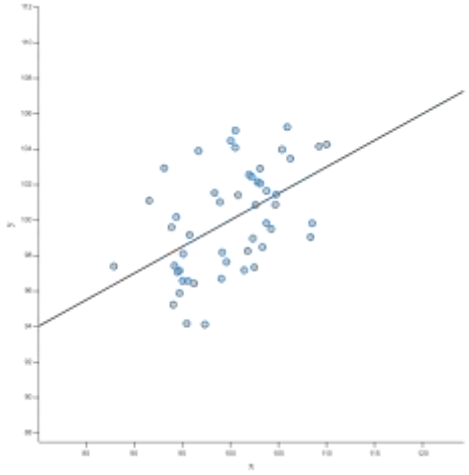
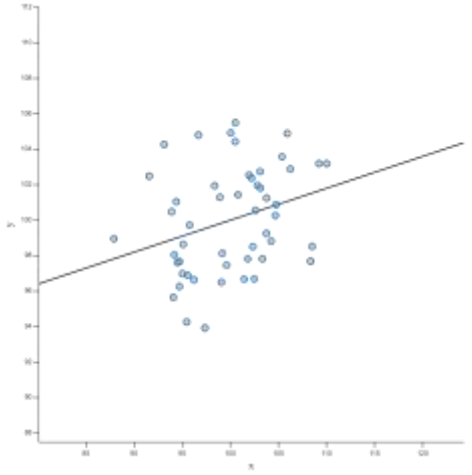
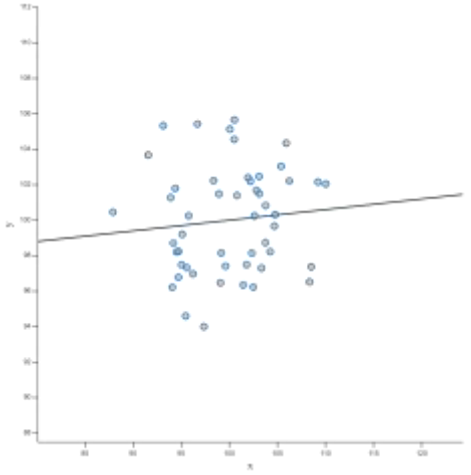


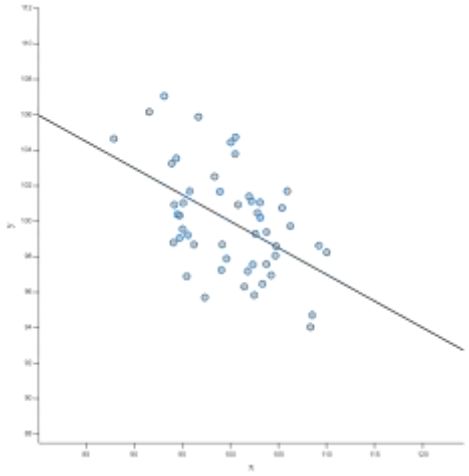
Figure 6.4 Range of Pearson's r, From –1.00 (Strongest Possible Negative Relationship), Through 0 (No Relationship), to +1.00 (Strongest Possible Positive Relationship)

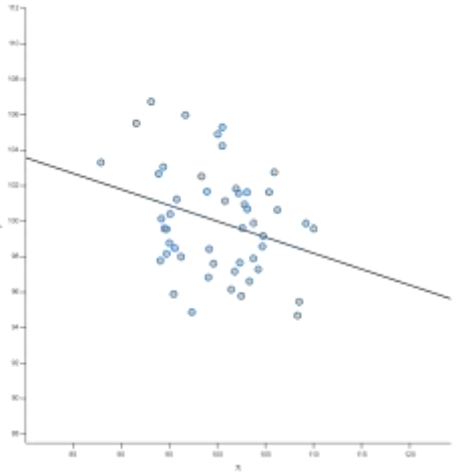
Watch out for correlations which are **spurious**…

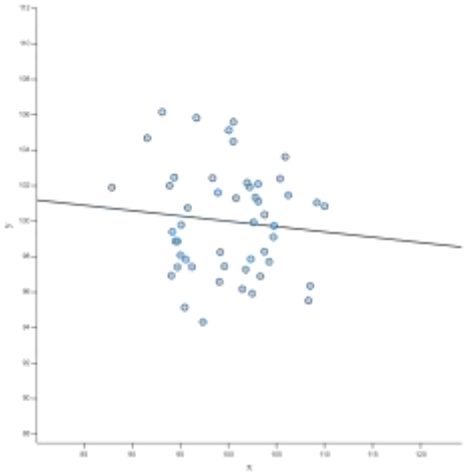












More examples of correlations using R

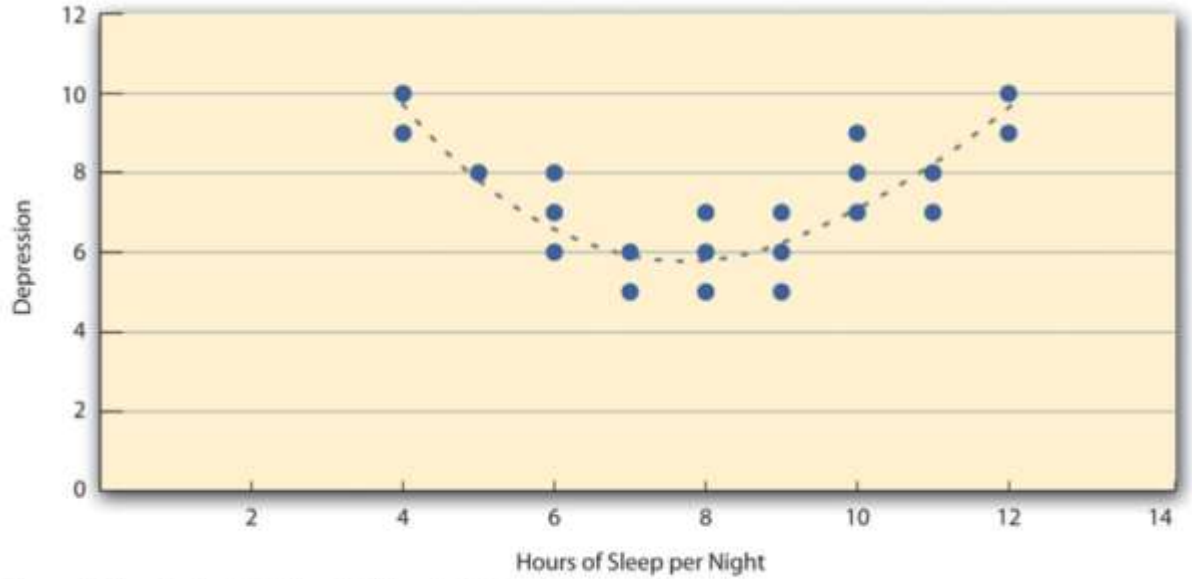


Figure 6.5 Hypothetical Nonlinear Relationship Between Sleep and Depression

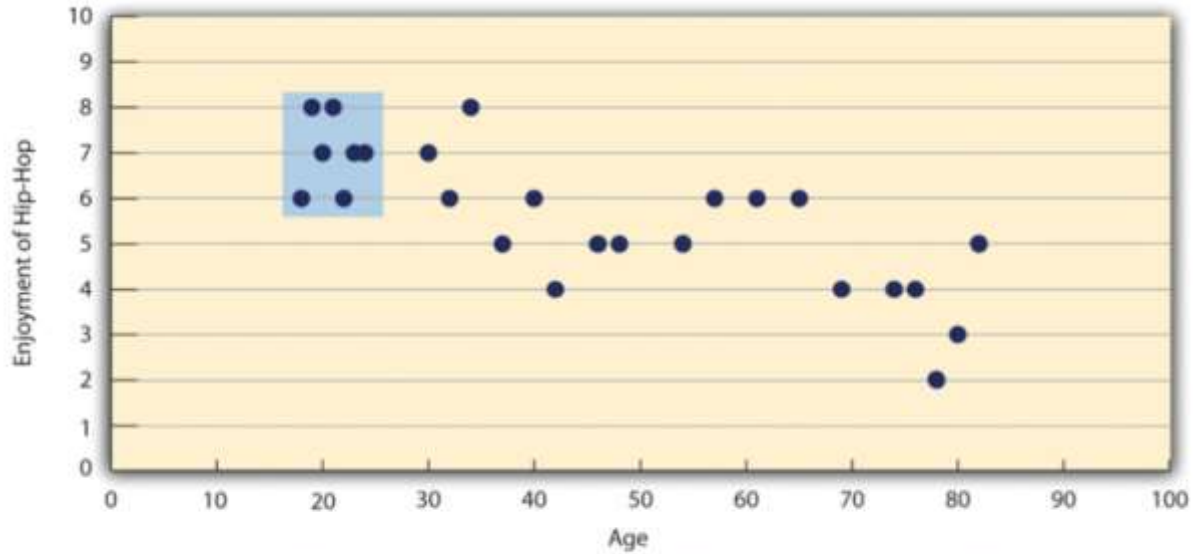


Figure 6.6 Hypothetical Data Showing How a Strong Overall Correlation Can Appear to Be Weak When One Variable Has a Restricted Range. The overall correlation here is –.77, but the correlation for the 18- to 24-year-olds (in the blue box) is 0.

Does mental health funding reduce mental health-related morbidity?

Table 1 Mortality across the OECD (deaths per 100,000)

From: Managing mental health: why we need to redress the balance between healthcare spending and social spending

Year	All-Cause Mortality	Mental-health Mortality
1980	1386.6	8.5
1985	1443.8	12.5
1990	1330.6	14.2
1995	1210.4	19.9
2000	1039.7	17.9
2005	965.8	18.5
2010	854.9	20.2
2015	801.8	28.0
Change	– 42.1%	228.4%

Source: OECD Health Status: Causes of Mortality

"...mean spending on social services across the OECD has risen from 16.5% of GDP to 20.5% since 1990, **an increase of 24%**, whilst spending on healthcare has increased from 6.5% to 8.8% of GDP, **an increase of 35%**. "

Source: Park et al., 2020

Correlation matrix

- When exploring for correlations between multiple variables
  - Cacioppo and Petty (1982) created a *Need for Cognition* Scale to measure the extent to which people like to think and value thinking—they used it to measure the need for cognition along with three other variables: intelligence, socially desirable responding (the tendency to give what one thinks is the "appropriate" response) and dogmatism.

Table 6.1 Correlation Matrix Showing Correlations Among the Need for Cognition and Three Other Variables Based on Research by Cacioppo and Petty (1982)

	Need for cognition	Intelligence	Social desirability	Dogmatism
Need for cognition	–			
Intelligence	+.39	–		
Social desirability	+.08	+.02	–	
Dogmatism	−.27	−.23	+.03	–

Factor analysis

- Cluster variables that are correlated with each other into individual factors (strong *within*-cluster correlation; weak *between*-cluster correlation)
  - Rentfrow & Gosling (2014) submitted 14 genres of music to a factor analysis and identified four distinct factors. These were labelled *Reflective and Complex* (blues, jazz, classical, and folk), *Intense and Rebellious* (rock, alternative, and heavy metal), *Upbeat and Conventional* (country, soundtrack, religious, pop), and *Energetic and Rhythmic* (rap/hip-hop, soul/funk, and electronica)

Table 6.2 Factor Loadings of the 14 Music Genres on Four Varimax-Rotated Principal Components. Based on Research by Rentfrow and Gosling (2003)

	Music-preference dimension			
Genre	***Reflective and Complex***	***Intense and Rebellious***	***Upbeat and Conventional***	***Energetic and Rhythmic***
Blues	**.85**	.01	-.09	.12
Jazz	**.83**	.04	.07	.15
Classical	**.66**	.14	.02	-.13
Folk	**.64**	.09	.15	-.16
Rock	.17	**.85**	-.04	-.07
Alternative	.02	**.80**	.13	.04
Heavy metal	.07	**.75**	-.11	.04
Country	-.06	.05	**.72**	-.03
Sound tracks	.01	.04	**.70**	.17
Religious	.23	-.21	**.64**	-.01
Pop	-.20	.06	**.59**	.45
Rap/hip-hop	-.19	-.12	.17	**.79**
Soul/funk	.39	-.11	.11	**.69**
Electronica/dance	-.02	.15	-.01	**.60**

Note. N = 1,704. All factor loadings .40 or larger are in italics; the highest factor loadings for each dimension are listed in boldface type.

Qualitative research

- Widely used in anthropology and sociology
- Open-ended research questions that can inform subsequent quantitative investigations
  - Mixed method research combines qualitative and quantitative approaches
- "Unfiltered" non-quantitative data that helps generate novel research questions within a relatively unknown area
- Data analysis strategies
  - Grounded theory (start with the data and "build-up" an underlying **theoretical narrative**)
  - Triangulate findings from quantitative and qualitative approaches (*convergence* suggests a well-formed research question; *divergence* can lead to further research questions

Table 6.3 Some contrasts between qualitative and quantitative research

Qualitative	Quantitative
1. In-depth information about relatively few people	1. Less depth information with larger samples
2. Conclusions are based on interpretations drawn by the investigator	2. Conclusions are based on statistical analyses
3. Global and exploratory	3. Specific and focused

Table 6.4 Themes and Repeating Ideas in a Study of Postpartum Depression Among Low-Income Mothers. Based on Research by Abrams and Curran (2009).

Theme	Repeating ideas
Ambivalence	"I wasn't prepared for this baby," "I didn't want to have any more children."
Caregiving overload	"Please stop crying," "I need a break," "I can't do this anymore."
Juggling	"No time to breathe," "Everyone depends on me," "Navigating the maze."
Mothering alone	"I really don't have any help," "My baby has no father."
Real-life worry	"I don't have any money," "Will my baby be OK?" "It's not safe here."

Observational research

- Naturalistic observation (observe where activity naturally occurs)
  - Disguised vs. Undisguised naturalistic observation
  - Limitation: **Hawthorne effect** - reaction to the knowledge of being observed
- Structured observation
  - Observation in more artificial (as opposed to natural) settings, such as an actual prison (though there may be risks in naturalized settings)
  - Emphasis in quantitative data (e.g., how many times does a stranger make eye contact in a bar setting?)
- Participant observation
  - Researchers can be active in the research activity (disguised vs. undisguised)
- Case study (in-depth study of some individual)
  - Common in clinical studies