

**How much TV do you watch per week?**

- a) as much as I can
- b) a lot
- c) some
- d) a little
- e) not at all

**How much is “some” in hours per week?**

**Compared to all other people living in  
Germany, how would you rate your  
health?**

- a) good**
- b) fair**
- c) poor**

**Compared to all other people living in  
Germany, how would you rate your  
health?**

- a) excellent**
- b) very good**
- c) good**
- d) fair**
- e) poor**

**Eating 4 servings of vegetables per day is a good idea**

**5**

**4**

**3**

**2**

**1**

**Strongly Agree**

**Strongly Disagree**

**I eat 4 servings of vegetables per day**

**5**

**4**

**3**

**2**

**1**

**Strongly Agree**

**Strongly Disagree**

**I consider myself to be more outgoing  
than my fellow students**

7

6

5

4

3

2

1

Strongly Agree

Strongly Disagree

# Biases in Questionnaires

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How Do I Lie with Statistics

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# Outline

- Introduction
- Biases in Question Design
- Biases in Questionnaire Design
- Biases in Questionnaire Administration



# Introduction

- **why questionnaires?**
  - cheap
  - quick
  - efficient for large amounts of information
  - measuring beliefs, behavior, attitudes, intentions, preferences...
- **types of questions**
  - open questions => qualitative data
  - closed questions => quantitative data

# Biases in Question Design

How much TV do you watch per week?

- a) as much as I can
- b) a lot
- c) some
- d) a little
- e) not at all

Häufigkeit von Nebenwirkungen		
Häufigkeitsangabe	Zahl der betroffenen Anwender	in Prozent
sehr häufig	mehr als 1 von 10	über 10%
häufig	1-10 von 100	1%-10%
gelegentlich	1-10 von 1.000	0,1%-1%
selten	1-10 von 10.000	0,01%-0,1%
sehr selten	weniger als 1 von 10.000	unter 0,01%

[https://gutepillen-schlechtepillen.de/beipackzettel-hilfe-oder-notwendiges-uebel/?doing\\_wp\\_cron=1573676595.2645270824432373046875](https://gutepillen-schlechtepillen.de/beipackzettel-hilfe-oder-notwendiges-uebel/?doing_wp_cron=1573676595.2645270824432373046875)

How much is “some” in hours per week?

What counts as “watching TV”?

# Biases in Question Design – Problems with Wording

- “vague words in vague questions encourage vague answers”

- watch out for technical terms...

*Do you think priming had an impact on your answers?*

- ...and uncommon words

- complex, lengthy and double-barrelled questions

*Has it happened to you that over a long period of time, when you neither called your parents nor your brother or sister, you got homesick or you impulsively bought a train ticket home for the upcoming weekend?*

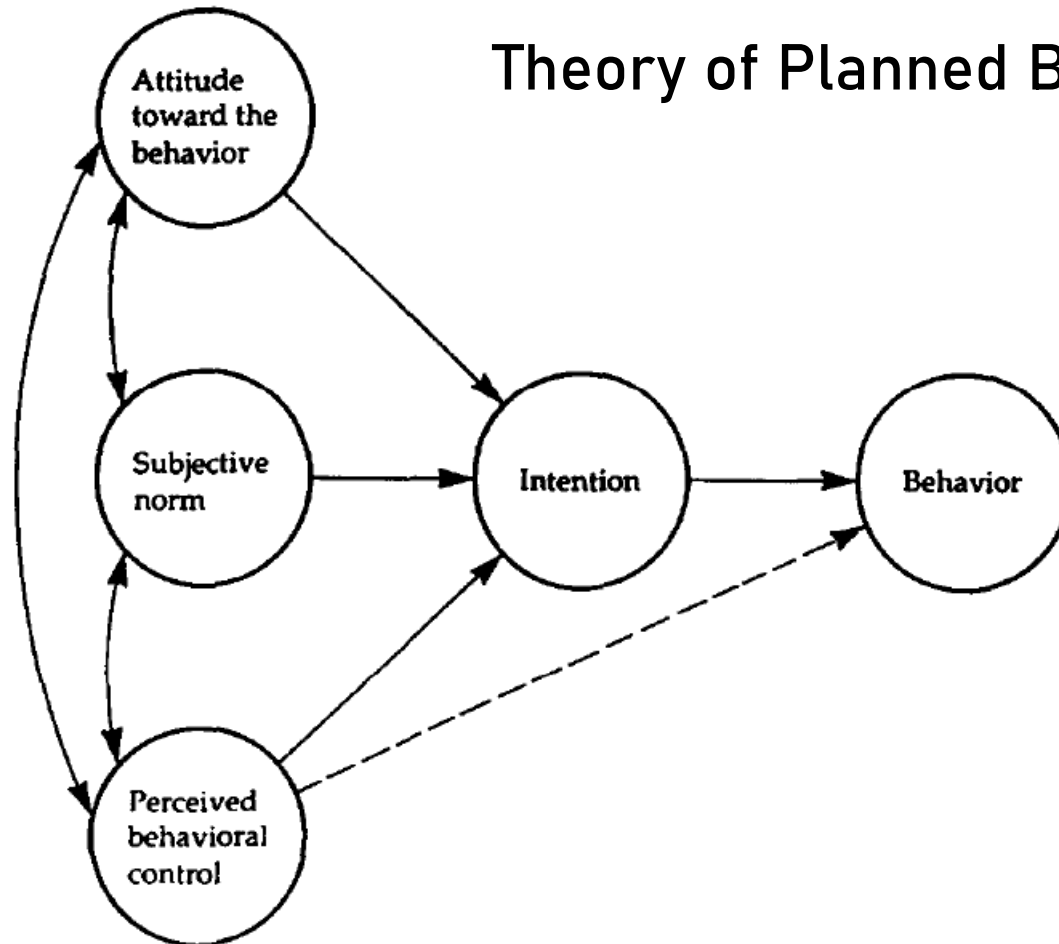


# Biases in Question Design – Adequate Data for Intended Purpose?

- belief vs. behavior
  - hypothetical and personalized questions
  - belief  $\neq$  behavior

# Biases in Question Design – Adequate Data for Intended Purpose?

## Theory of Planned Behavior



Ajzen (1991)

# Biases in Question Design – Adequate Data for Intended Purpose?

- belief vs. behavior
  - hypothetical and personalized questions
  - belief  $\neq$  behavior

- time frame

*Did you have a picnic at the Neckar last month?*

- insensitive, degraded measures

*Is health important to you? - Yes/No*

*How important is health to you?*

*(important) 1-2-3-4-5-6-7 (not important)*

# Biases in Question Design - Inconsistency

- “More and more nitrate in groundwater”
- “From 2013 to 2017 the average nitrate concentration in the top 15 polluted regions has increased by 40mg/l”
- same with ICD (international classification of diseases) codes
  - prevalence of diseases



# **Biases in Question Design - Inconsistency**

**Compared to all other people living in  
Germany, how would you rate your  
health?**



# Biases in Question Design - Inconsistency

- How many of you rated their health excellent or very good?
  - a) good
  - b) fair
  - c) poor
  - a) excellent
  - b) very good
  - c) good
  - d) fair
  - e) poor
- 1985 NCHS-NHIS (National Center for Health Statistics National Health interview survey) vs. 1995 NCHS-NHIS
- same for change of wording

# Biases in Questionnaire Design

- response format

*Your health is:*

Excellent ...  Good ...  Fair ...  Poor ...

*Your health is:*

Excellent .....

Good .....

- left vs. right alignment

*Your health is:*

excellent ...

good .....

fair .....

poor .....

*Your health is:*

excellent

good

fair

poor

better for telefon/face-to-face interviews

better for self-administered questionnaires

# Biases in Questionnaire Design

- **yes-/no-saying => answer all questions with yes/no**
- **response fatigue => too many questions**
  - personal interviews 50-90 minutes
  - telephone interviews 30-60 minutes
  - self-administered questionnaires 10-20 minutes

# Biases in Questionnaire Administration

## – Interviewer

- Rosenthal-Effect

- self fulfilling prophecy

- expectations influence study outcomes

- => double-blind study design

# Biases in Questionnaire Administration

I consider myself to be more outgoing than my fellow students

7

6

5

4

3

2

1

Strongly Agree

Strongly Disagree

# Biases in Questionnaire Administration

## – Respondent Subconscious

- avoid ends of scales

I consider myself to be more outgoing than my fellow students

7

6

5

4

3

2

1

Strongly Agree

Strongly Disagree

- positive answers on items about satisfaction

*Are you satisfied with your family?*

*Are you satisfied with your career?*



# Biases in Questionnaire Administration

## – Respondent Conscious

- **social desirability**

- alter responses in the desired direction

- social desirability scale

*My table manners at home are as good as when I eat out in a restaurant.*

*No matter who I'm talking to, I'm always a good listener.*

- **unacceptability**

- diseases, drug abuse, invading privacy

# Biases in Questionnaire Administration

## – Respondent Conscious

- Hypothesis guessing
  - “help the researcher”
  - “being a good participant”

*Did you sleep well last night?*

*How many hours of sleep did you get last night?*

*Did you wake up with a headache this morning?*

*Did you wake up with a sore throat this morning?*

# Biases in Questionnaire Administration

## – Inaccurate Recall

- primacy and recency effect
  - choose the first options on a list in mail surveys
  - choose later categories in telephone/interview surveys
- answering for others
  - actor-observer bias vs. egocentric bias

# Biases in Questionnaire Administration

- Inaccurate Recall

- memories are reconstructed
  - study “Lost in the Mall”
  - produce wrong memories

# Biases in Questionnaire Administration

- surroundings
  - atmosphere => increase in life satisfaction when participants are in a comfortable room
  - weather => positive effects of solar exposure on subjective well-being measurements

# Biases in Questionnaire Administration

- cultural differences

*What is your monthly income?*

*What is your annual income?*

– culture fair intelligence tests

# How to influence question outcomes – 2 examples

Do you think smoking is fine although other people could be bothered?

Do you think smoking is fine although it drastically increases the risk for lung cancer?

7

6

5

4

3

2

1

Strongly Agree

Strongly Disagree

# How to influence question outcomes – 2 examples

Are you going to wear a helmet for cycling in the future?

In 2018 90.000 bicycle riders died on german streets. Are you going to wear a helmet for cycling in the future?

7

6

5

4

3

2

1

Very Likely

Very Unlikely



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