Moderators of panel conditioning effects. A meta-analysis.

Tanja Burgard
Nadine Kasten
Michael Bosnjak

leibniz-psychology.org

Leibniz Gemeinschaft

Definition and relevance of panel conditioning

An example:

Veroff, Hatchett and Douvan (1992) randomly assigned newlywed couples to one of two groups: one that participated in frequent and intensive interviews (the study group) about marital satisfaction and well-being over the course of four years and another that participated in minimal and infrequent interviews over that period. The authors concluded that "[b]y the fourth year . . . The marriages of the study group couples appeared to be better adjusted on several dimensions of marital quality" (p. 315).

Warren, Halpern-Manners (2012): Panel Conditioning in Longitudinal Social Science Surveys. Sociological Methods and Research 41(4): 491-534.

- Panel Conditioning = Learning effect in panel studies
- Problem: Due to the conditioning of respondents in former survey waves, they are no longer representative for non-respondents in later waves.

Possible moderators of panel conditioning and hypotheses

- H 1: PC effects are strongest for **knowledge questions** as compared to other types of questions (attitudes, behavior, intentions, wellbeing, demographics).
- H 2: PC effects are stronger for **sensitive questions** as compared to insensitive questions.
- H 3: The **more often** a respondent has participated in a survey, the stronger the PC effect.
- H 4: The **shorter the interval** between two waves, the stronger the PC.
- H 5: The strength of PC effects has **decreased over time**. That means, the later the year of data collection, the weaker the PC.

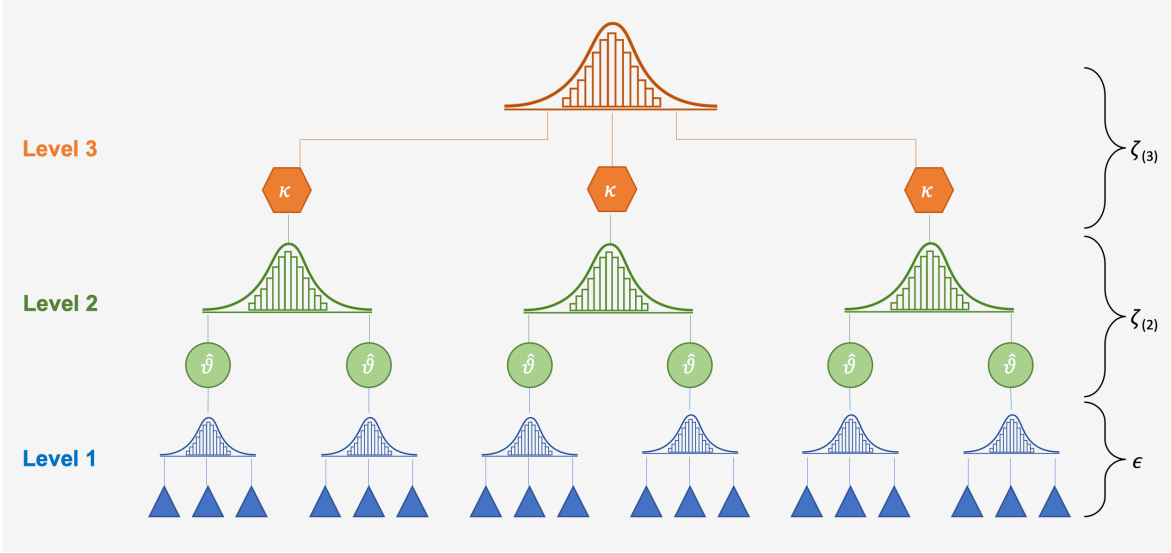
Information search and selection

- First literature search:
  - CLICsearch (broad search interface containing for example PsycInfo, PsycArticles, PubMed, Sociological Abstracts)
  - Search terms: „panel conditioning“, „survey conditioning“, „time in sample“, „rotation group bias“ and 10 related synonyms
- Eligibility criteria: (Quasi-) experiments comparing response behavior of experienced panel respondents with a control group
- Forward and backward search with records from the first search meeting eligibility criteria

  → Total Number of eligible reports: 44
- Information already coded for n=25 reports, containing
  - x=115 studies and
  - k=346 effect sizes (standardized mean differences)

Analysis method

- To account for the hierarchical data structure, a three-level meta-analysis is used



Level	Unit	Variance
3	Studies	Between studies
2	Out-comes	Within studies
1	Partici-pants	Sampling

Source: Harrer, M. & Ebert, D. D. (2018). Doing Meta-Analysis in R: A practical Guide. *PROTECT Lab Friedrich-Alexander University Erlangen-Nuremberg*. https://bookdown.org/MathiasHarrer/Doing_Meta_Analysis_in_R/

- R package used: metafor 2.0-0

Results meta-regression – Overall effect

- k= 346 effect sizes, x=115 studies, n= 25 reports
- Mean effect of panel conditioning (SMD): 0,101; 95% CI: [0,086; 0,115]
- Distribution of heterogeneity:
  - Sampling variance: 0,3 %
  - Within studies: 45,8 %
  - Between studies: 53,9 %

I^2: True heterogeneity (Variance in the true effects)

Moderator analysis – Type of question

H1: PC effects are strongest for knowledge questions as compared to other types of questions (attitudes, behavior, intentions, wellbeing, demographics). ✓

Type of question	k	Estimated PC-effect	95 % - Conf.Interval
Knowledge (Intercept)	21	0,216***	0,161; 0,272
Attitudes	72	-0,113***	- 0,177; - 0,050
Behavior	66	-0,116***	- 0,180; - 0,052
Psych. wellbeing	65	-0,122***	- 0,187; - 0,056
Demographics	112	-0,132***	- 0,191; - 0,074
Other	10	-0,076.	- 0,155; 0,004

k = 346 effect sizes
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Around 26,5 % of the variance between studies can be explained.

Moderator analysis – Summarized findings

Moderator	PC-effect estimator	Conf. Interval	Hypothesis
Sensitivity	-0,011	-0,044; 0,021	2
Frequency	0,003**	0,001; 0,004	3
Interval	-0,000	-0,001; 0,000	4
Year data collect.	-0,007	-0,023; 0,008	5

Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
Results from mixed effects multilevel meta-analysis with k = 309 effect sizes due to exclusion of statistical outliers in moderator variables.

All five moderators explain

- Around 4,5 % of the variance within studies
- Around 20 % of the variance between studies

Conclusions and outlook

- Knowledge questions are affected the most by panel conditioning
- The more often participants are surveyed, the stronger the PC effects
- Panel conditioning effects are heterogeneous and different kinds of PC effects should be investigated further
- Outlook:
  - Extension of database: More studies, direction of PC effects, different manifestations of PC (Satisficing, Opinionation, Knowledge change,…)
  - Expected results:
    - Evidence for different manifestations of PC
    - Conclusions concerning the data quality
    - Recommendations for the conduction of panel studies

Thank you for your attention!

Questions?!?

Manifestations of panel conditioning

Panel conditioning in the context of the answering process in surveys (Tourangeau et al. 2000):

- Stage 1: Comprehension of the question
  → [-] Change in attitudes or behavior due to reflection / increased attention
  (Sturgis et al 2009: Cognitive stimulus model)
  → [+] Less „don‘t know“-answers
- Stage 2: Information retrieval
  → [+] More reliable answers due to better accessibity of relevant information
  (Bergmann, Bath 2017)
- Stage 3: Assessment of available information
  → [-] Freezing of attitudes to appear consistently (Waterton, Lievesley 1989)
- Stage 4: Reporting / Selection of adequate answer
  [+] Reduction of social desirability bias → more honest answering (Waterton, Lievesley 1989)
  [-] Reduction of the cognitive burden of the survey by strategic answering / satisficing (Krosnick 1991):
  - Negative answering of filter questions to avoid follow-up questions
  - Selection of acceptable answers without processing the content

Rationale for the expected time effect of panel conditioning effects

- Pluralism / less bindingness of social norms
  - Social desirability less important for new respondents, too
- Information overload and scarcity of attention
  - Cognitive stimulus due to survey participation less pronounced
  - Information of previous surveys are less accessible due to amount of information
- Increase in surveys and scientific studies
  - More familiarity with the rules of surveys
  - Satisficing and strategic answering is more probable with new respondents, too
- General tendency: Decrease of panel conditioning, because respondents are less affected by the survey participation and thus, differences between new and experienced respondents tend to level out

PRISMA Flow Chart