

Response rates in psychological online surveys. A meta-analysis on the effects of study design and time.

Talk at the Conference of the European Survey Research Association (ESRA)
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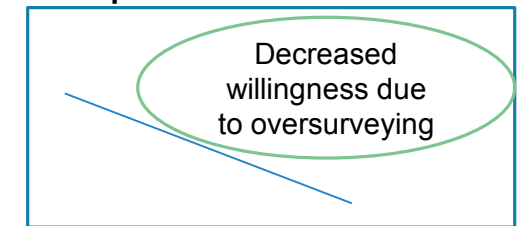
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PROBLEM: DECLINING PARTICIPATION IN PSYCHOLOGICAL SURVEYS

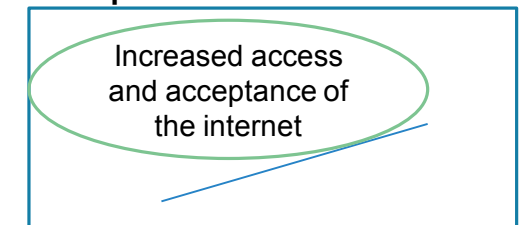
- Nonresponse has increased since the 1990s
 - in social sciences and politics (Brick & Williams, 2013) and
 - in counseling and clinical psychology (Van Horn & al., 2009)
 - Problem: Often systematic → Biased results
- Trend in recent years: Growing popularity of online surveys in psychology
 - Web surveys yield lower response rates than other survey modes (Lozar Manfreda & al., 2008)
 - Web surveys may be less representative
 - Dynamic field: Growing number of internet users and increase in web surveys → Change over time?

Response



Time

Response



Time

RESEARCH QUESTIONS

- How has the willingness to participate in psychological online surveys developed over time?
 - We assume declining initial response rates.
- Which further variables do moderate initial response rates?
 - We explore the influence of the following moderators: Mode of invitation, incentives and length of the questionnaire
 - The findings should guide researchers in how to optimally implement psychological online surveys yielding high response rates
- We focus on samples with a relevant share of people suffering from depression or anxiety disorder → epidemiologically relevant subgroup in psychology

HYPOTHESES ON MODERATORS OF PARTICIPATION

H 1: The initial response rate in psychological online surveys has decreased over time.

- Amount of communication has increased, as well as number of surveys and scientific studies, especially online surveys become more popular → oversurveying
- More information has to be processed, less stimulation and attention to single communication requests

H 2: The higher the number of items in a questionnaire, the lower the initial response rate.

H 3: Initial response rates are higher, if incentives are given for participation.

Cultural change to individualism: Respondents feel less socially obliged and rather base their decision to participate on costs and benefits (Johnson & al., 2002).

H 4: The more personal the contact mode of the invitation, the higher the initial response rate.

In the mass of communication requests, personal address is a way to get attention.

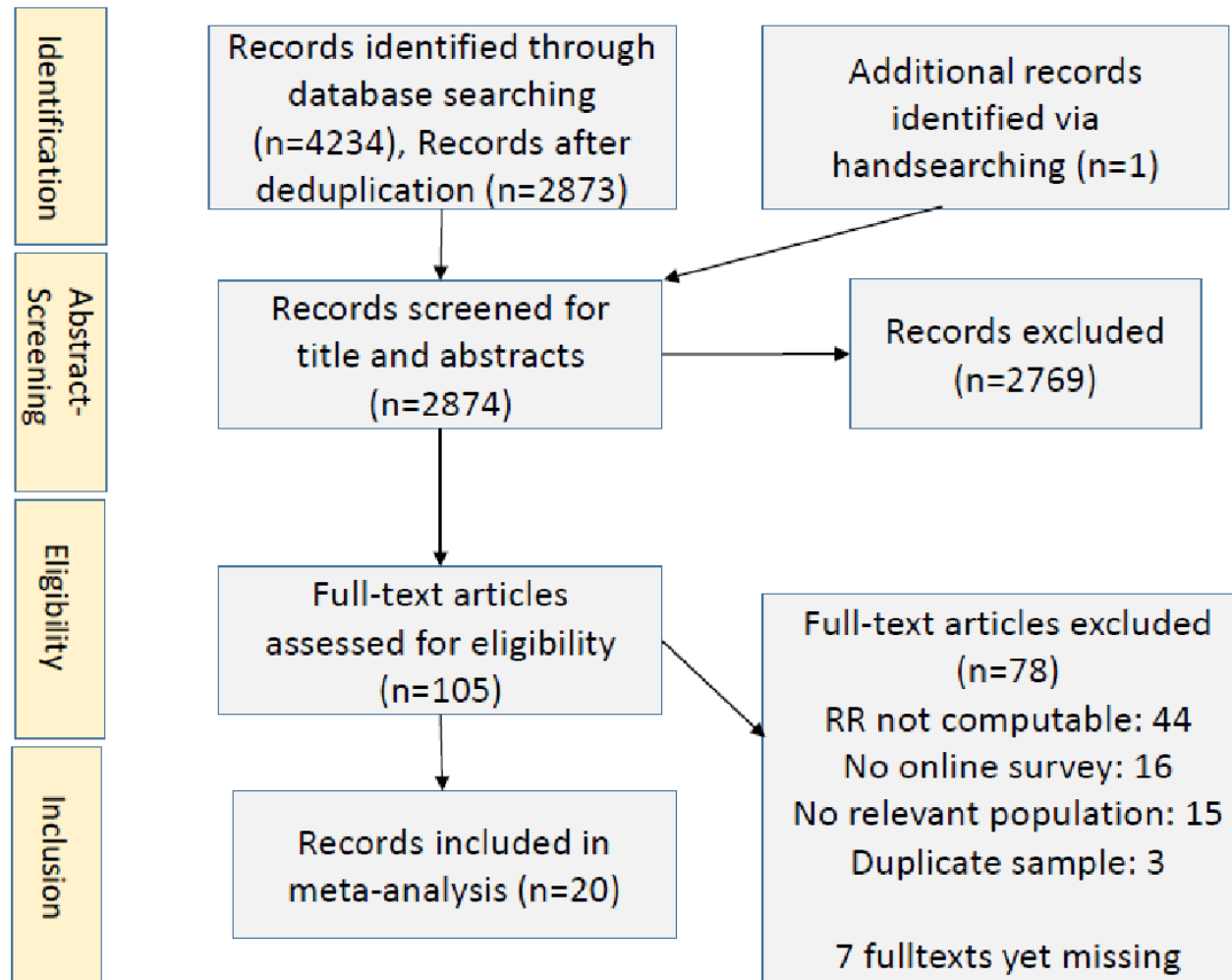
ELIGIBILITY CRITERIA

- Population: At least 30 % of adults (> 18 years) with depression or anxiety disorder, no student samples
- Outcomes: Response rate or information on the flow of participants that allow the computation of the response rate
- Study type: Psychological online surveys reporting on relevant study design characteristics (burden of participation or incentives or contact mode)

LITERATURE SEARCH: DATABASES AND SEARCH TERMS

- 10 databases searched:
PsycInfo, Embase, Medline & In-Process Citations, Medline Ahead of Print & Daily Update, Campbell Library, Science Citation Index, SocIndex, CENTRAL, PubPsych, ReStore
- Conference proceedings searched manually:
ESRA and AAPOR (the past three years)
- Search terms:
("participation rate" OR "response rate")
AND ("online survey" OR "online surveys" OR "internet survey" OR "electronic survey" OR "email survey")
AND (Anxi* OR depress*)

LITERATURE SELECTION PROCESS: PRISMA FLOW



CODING AND DATA EXTRACTION

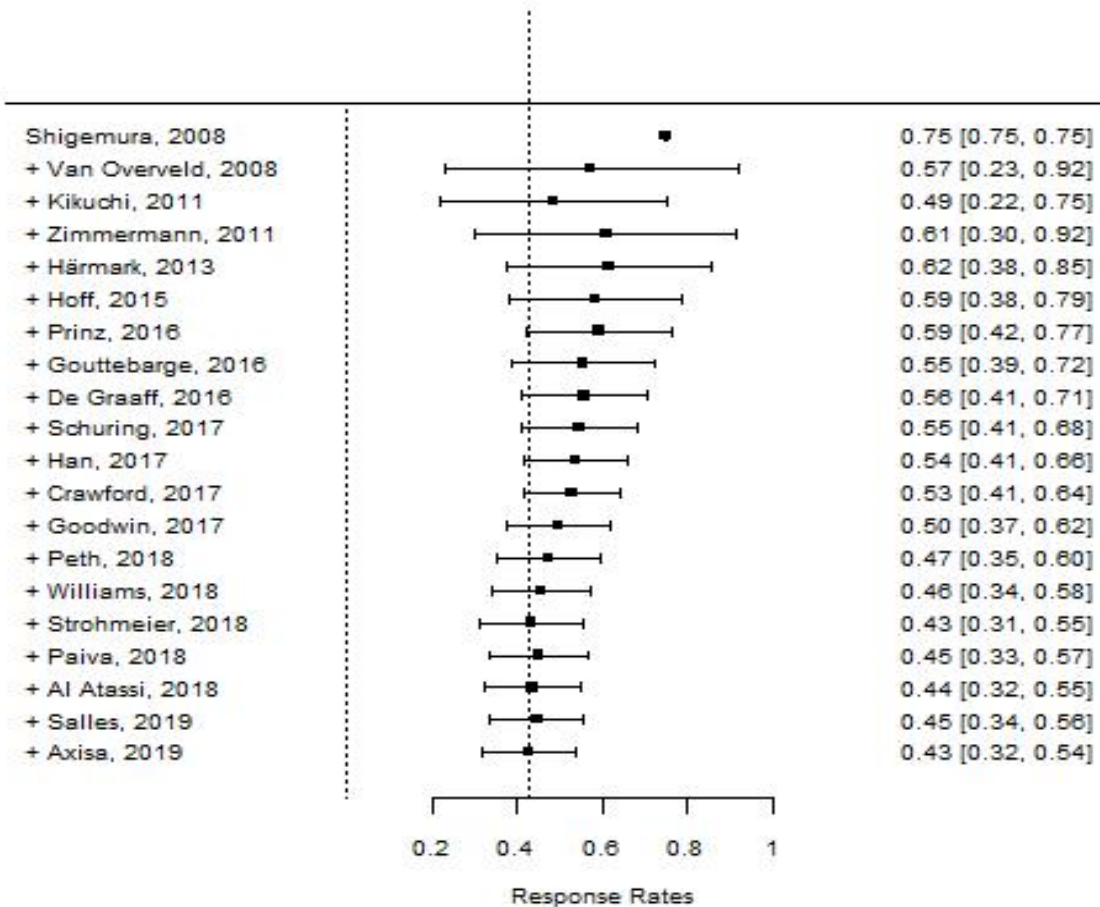
Report	Sample	Study design	Effect sizes
<ul style="list-style-type: none">- First author- Publication year- Publication type- Peer-Reviewed?- Sponsorship	<ul style="list-style-type: none">- Target population- Percentage female- Mean age- Year data collection- Country data collection	<ul style="list-style-type: none">- Type of recruitment (list-based, probability- or access-panel)- Mode of invitation (E-Mail, Mail, Telephone, Other)- Duration of study participation (items)- Incentives (yes, no)- Topic	<ul style="list-style-type: none">- Results from the report: Returned questionnaires, Refusals, Non-contacts, Unknown eligibility, Not eligible (screened out / quota filled)- Effect size: Response rate = Percentage of the target population responding (Cook et al. 2000)

ANALYSIS METHOD

- All analyses are conducted using the metafor package (2.1-0) in R (Viechtbauer 2010)
- We computed four meta-analytic models:
 1. Overall effect: Random-Effects model without moderators
 2. Time effect: Random-Effects model with only publication year as moderator
 3. Effect of study characteristics: Random-Effects model with all hypothesized moderator variables (publication year, mode of invitation, length survey, incentives)
 4. Full model + controls: Model 3 + additionally controlling for type of recruitment, use of funds for study conduction and mean age of the sample

OVERALL EFFECT

Cumulative forest plot



Random-Effects Model (k = 20)

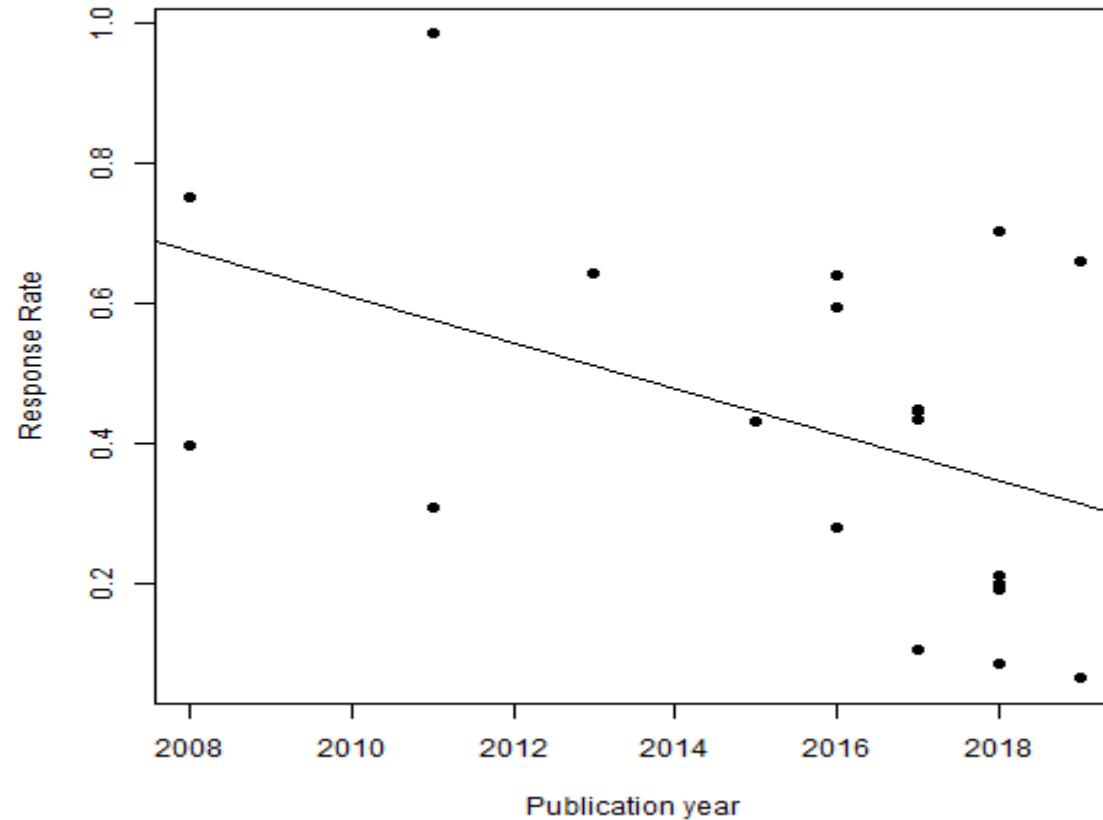
τ^2 : 0.063

I^2 : 99.92%

Test for Heterogeneity: p-val < .001

Overall mean: 0.428 [0.317; 0.539]

TIME EFFECT



Random-Effects Model (k = 20)

Estimated effect of publication year on RR:
-0.112, p-val < .034

15.75 % of heterogeneity are accounted for by
Pubyear

STUDY DESIGN EFFECTS

- The hypothesized study design effects (publication year, number of items, use of incentives and mode of invitation) explain 29 % of the heterogeneity of the dependent variable RR
- If additionally controlled for the type of recruitment, the use of funds and the mean age of the sample, 53 % of the heterogeneity are explained
- All in all, the results of the meta-regression support the hypotheses for the effects of publication year (H1), number of item (H2) and the mode of invitation (H4)
- The hypothesized effect of incentives (H3) cannot be supported

DISCUSSION AND OUTLOOK

- Hypothesized influences on participation mostly confirmed:
 - The mean response rate is about 43 %
 - Response rates are lower in more recent years and in case of longer questionnaires
 - More personal forms of approaching people yield higher response rates than E-Mail invitations
 - Effect of incentives could not be confirmed (perhaps not enough evidence to draw conclusions, due to small number of studies that reported use of incentives)
- Further evidence needed!
 - Meta-analysis restricted to populations with depression or anxiety disorders
→ validation with other populations important!
 - We need more evidence from online surveys using incentives to test this effect, too

LITERATURE

Brick; Williams (2013): Explaining rising nonresponse rates in cross-sectional surveys. *Annals of the American Academy of political and social science*, 645(1), 36-59.

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Johnson; O'Rourke; Burris; Owens (2002): *Culture and Survey Nonresponse*. In: Groves; Dillman; Eltinge; Little (Hrsg.): *Survey Nonresponse*. John Wiley & Sons, New York.

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Tourangeau; Rips; Rasinski, (2000): *The psychology of survey response*. Cambridge University Press.

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DEFINING AND COMPUTING RESPONSE RATES AS MAIN OUTCOME

- Information retrieved from studies (AAPOR 2016)
 - A: Participants providing sufficient information
 - B: Eligible, but non-interview (Refusal, no contact, language barrier)
 - C: Unknown eligibility, non-interview (Nothing returned, undelivered)
 - D: Not eligible (screened out, quota filled)
- Computation of Response Rate (RR)
 - $RR = \text{Number of responders providing usable response (A)} / \text{number of eligible sample units (A+B+C)}$
- Problems:
 - Missing information on flow of participants
 - Online surveys often self-selected, information on population targeted / reached and refusals not available → no response rates computable!





ELIGIBILITY CRITERIA

Criteria	Inclusion	Exclusion
Population	Studies consisting of at least one sample or subgroup with at least 30 % of adults (> 18 years) with depression or anxiety disorder	<ul style="list-style-type: none"> - Student samples - Studies reporting on children or adolescents - Individuals with post-partum depression - Individuals with bipolar disorder
Outcomes	Response rate or information on the flow of participants that allow the computation of the response rate	Studies that do not give information necessary for computing response or participation rates
Study type	Psychological online surveys reporting on at least one of the following study characteristics: <ul style="list-style-type: none"> - Kind of invitation (<i>personalised, non-personalised or none</i>) - Burden of participation (<i>time spent, number of items, cognitive complexity</i>) - Incentives for participation (<i>monetary, non-monetary</i>) 	<ul style="list-style-type: none"> - Studies reporting on any survey type other than online surveys - Studies reporting on mixed survey types that don't explicitly report on an online survey subgroup. - Case reports and case studies reporting on <20 participants. - Panel studies that do not report results from the first wave. - Review articles and editorials.
Studies were not restricted based on publication date, language or publication format.		

OVERVIEW: VARIABLE DISTRIBUTION AND CORRELATION MATRIX

Variable	Mean	SD	Pub year	List-based sample	E-Mail invitation	Number items	Incentives	Resp. Rate
Publ. year	2016	3.44	-	0.298	-0.313	-0.176	-0.037	-0.444
List-based sample	0.80	0.41	-	-	-0.210	0.249	-0.375	0.184
E-Mail invitation	0.85	0.37	-	-	-	-0.485	0.210	-0.018
Number items	54	42.9	-	-	-	-	-0.192	-0.191
Incentives	0.20	0.41	-	-	-	-	-	-0.059
Response Rate	0.43	0.25	-	-	-	-	-	-

META-ANALYTIC MIXED-EFFECTS MODELS

Moderator	Model 3 results	Model 4 results	Hypothesis
Intercept	0.7291 [0.426; 1.033], p<0.001	0.724 [0.398; 1.050], p<0.001	-
Publication year	-0.177 [-0.287; -0.068], p=0.0015	-0.215 [-0.316; -0.113], p<0.001	1 
Number of items	-0.144 [-0.264; -0.024], p=0.0184	-0.149 [-0.270; -0.027], p=0.016	2 
Incentives	-0.055 [-0.295; 0.185], p=0.6542	0.066 [-0.146; 0.277], p=0.541	3 
E-Mail invitation	-0.342 [-0.683; -0.000], p=0.0497	-0.312 [-0.636; 0.013], p=0.060	4 
List-based sample		-0.394 [-0.634; -0.153], p=0.001	-
Funds	-	0.099 [-0.101; 0.299], p=0.333	-
Mean age sample	-	0.052 [-0.045; 0.149], p=0.295	-
I ²	99.72%	99.27 %	
R ²	28.79%	52.58 %	

MODEL PREDICTIONS FOR RESPONSE RATES

Pubyear	Length	E_Mail	Real_Response	Pred_Response	Difference
2008	34	1	0.7496	0.7134	0.04
2008	187	1	0.3966	0.3518	0.04
2017	31	1	0.1053	0.0949	0.01
2011	18	1	0.9839	0.8916	0.09
2017	56	1	0.4457	0.2543	0.19
2019	75	0	0.6602	0.4964	0.16