Recent Advancements of the Item-Count-Technique: Results on the Potential of the Item-Sum- and the Person-Count-Technique

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Outline

1. Introduction: Sensitive Questions in Surveys
2. The Item-Count-Technique (ICT) and Recent Advancements
   - Item-Sum-Technique (IST)
   - Person-Count-Technique (PCT)
3. Our Studies: Design and Variables
4. Results
5. Discussion

Introduction

- Sensitive questions in surveys:
  - Questions that are intrusive, that might involve a threat of disclosure, and/or questions about socially loaded behaviors or attitudes (Tourangeau & Yan 2007).
  - E.g., questions on sexual preference, health, income, self-reported delinquency, deviant behavior, substance abuse, voting, attitudes toward foreigners.

- The main problems of asking sensitive questions in surveys are **nonresponse** and **misreporting**.
  - Nonresponse especially a problem with questions on income.
  - Misreporting:
    - Overreporting of desirable behaviors or attitudes, underreporting of undesirable ones.
    - This yields biased prevalence estimates and biased correlations with other variables if misreporting is related to them.

Introduction

- Response bias: Some findings from validation studies:

Source	Item	True value	Survey estimate
Parry & Crossley 1950	Voter registration	69 %	83 %
	Participation in the presidential election	61 %	73 %
	Possession of library card	13 %	20 %
Weiss 1968	School problem of one‘s child	55 %	38 %
	Participation in elections	29 %	44 %
Locander et al. 1976	Private bancruptcy	100 %	69 %
	Driving under the influence	100 %	52 %
Hadaway et al. 1993	Weekly church attendance	28 %	51 %
Johnson et al. 2012	Cocaine consumption, last year	13 %	6 %
Wolter & Preisendörfer 2013	Convicted under criminal law	100 %	58 %

Introduction

- The most recent example:

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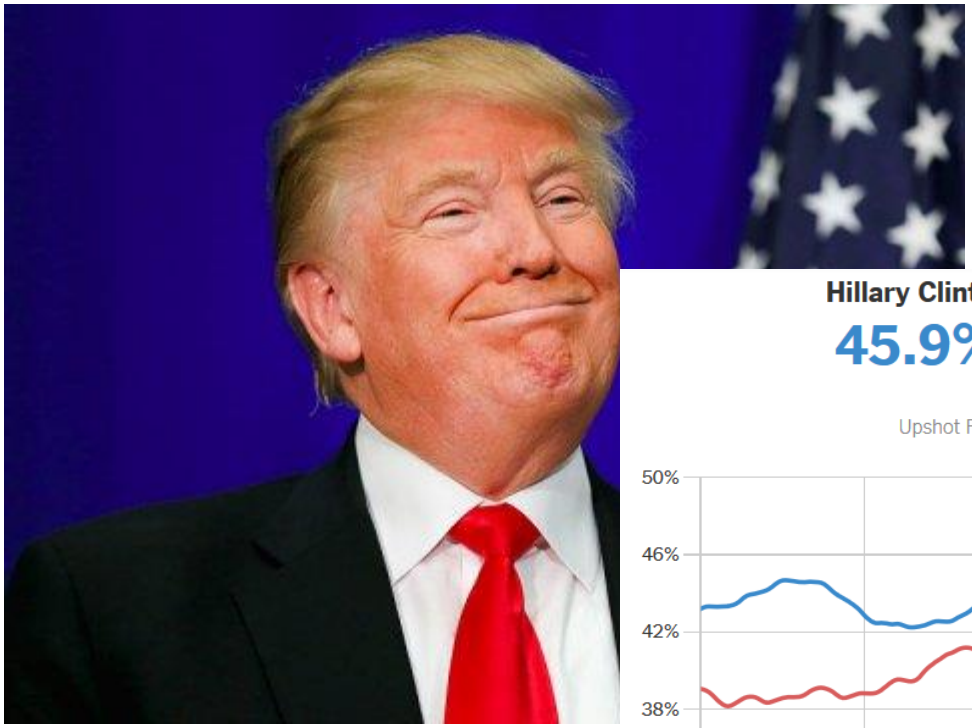

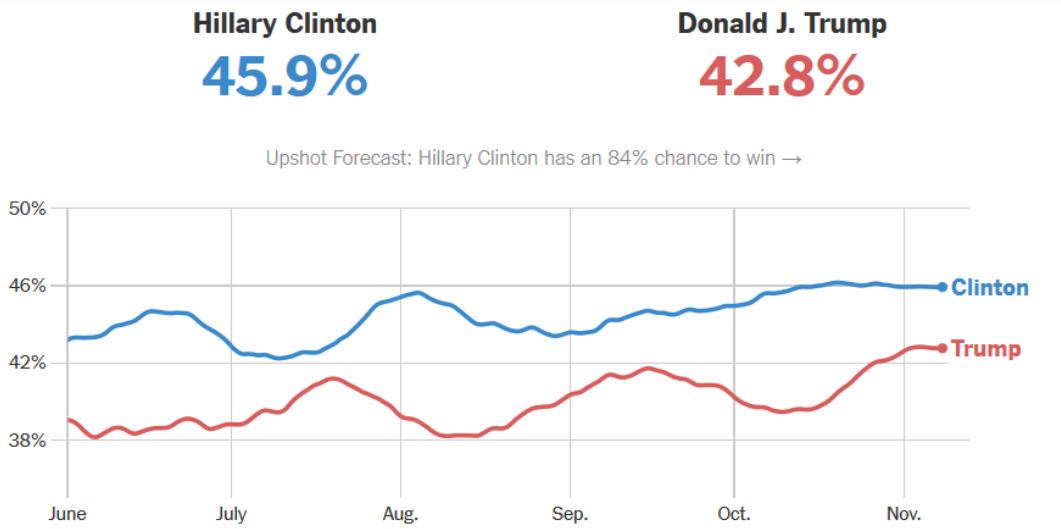

Introduction

- Strategies for tackling these problems:
  - Self-administered data collection modes
  - Data protection assurances
  - Question wording and question context
  - Sealed envelope technique
  - Randomized-response-technique (RRT, Warner 1965) and related (crosswise model, Yu et al. 2008)
  - Item-count methods (ICT, aka list experiment, unmatched-count-technique, Droitcour et al. 1991)

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- This paper: How do recent advancements of the classic ICT design perform as compared to standard direct questioning (DQ)?

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ICT: The Original Design

- Idea: Anonymization of the interview situation by adding random noise to the respondent‘s answer.
- Experimental design with a random split of the sample into (at least) two groups:
  - short-list group
  - long-list group
- Respondents in each group receive a list of (yes-no) questions:
  - harmless filler items in the short-list group.
  - harmless filler items plus the sensitive item in the long-list group.
- Respondents indicate only the number of items that apply.
- Individual answer to the sensitive item is not disclosed (unless no ceiling or floor effects occur, see below).

ICT: The Original Design

- Example (Wolter & Laier 2014), in-person survey:
  - INT: *„For the next questions, we are going to use a special technique that guarantees you complete anonymity. I am going to hand you lists with four [five] questions, which you should please read first. Then, please tell me only the number of questions that you answer with ‚yes', thus, a number between 0 and 4 [5]"*.

Short-list group

- Have you ever been abroad?
- Have you ever used a taxi?
- Have you been using a plane this week?
- Did you wash your car this week?

Long-list group

- Have you ever been abroad?
- Have you ever used a taxi?
- Have you been using a plane this week?
- Did you wash your car this week?
- Have you ever been driving a car although you had drunk too much alcohol?

ICT: The Original Design

- Calculation of the prevalence estimate of the sensitive item ($\hat{\pi}_{ICT}$):

  $\hat{\pi}_{ICT} = \bar{x}_{LL} - \bar{x}_{SL}$, with $\bar{x}_{SL}$ = mean of the short list
  $\bar{x}_{LL}$ = mean of the long list

- Sampling variance:

  $Var(\hat{\pi}_{ICT}) = Var(\bar{x}_{LL}) + Var(\bar{x}_{SL})$

- Assumption: Independence of the subsamples.

Recent Advancements of ICT

- Weak points of the standard ICT:
  - Each sensitive item in the survey requires a new item list.
  - Answering item lists can be cognitively demanding.
  - ICT only for binary sensitive items.
  - ICT estimates have substantially higher standard errors than DQ estimates.

- Person count technique (PCT, Grant et al. 2012, 2014):
  - Use person lists instead of item lists.

- Item sum technique (IST, Trappmann et al. 2014):
  - ICT for quantitative variables.

Person Count Technique (PCT)

- Proposed by Grant et al. (2012, 2014).
- PCT also applies for binary (yes-no) items.
- Short list is a number of persons. Respondents report the number of persons for whom something applies.
- Long list is a number of persons plus the respondent himself.
- All the rest (experimental design, calculation of prevalence estimates) works just as with standard ICT.

Person Count Technique (PCT)

- Design by Grant et al. (2012):

Introduction:

„We want to know that type of candidates people would support for President of the United States. Because this is a sensitive topic, we are not going to single you out.

Instead, please think about three people you see or talk to often and we‘re going to ask you how many of these three people might be willing to vote for each type of candidate.

We‘re going to ask about five candidates: a Republican, a Democrat, a Tea Party candidate, a Mormon, and a woman.

It‘s ok to guess if you are not sure how many of the three people would vote for each candidate. […]“

Short-list group (3 people)

Long-list group (3 people + oneself)

Person Count Technique (PCT)

- Design by Grant et al. (2012):

Short-list group (3 people)

„Thinking of these three people, how many would be willing to vote for a …

- Republican?
- Democrat?
- Woman?
- Member of the Tea Party?
- Mormon?“

Long-list group (3 people + oneself)

„Thinking of you and these three people, how many of you would be willing to vote for a …

- Republican?
- Democrat?
- Woman?
- Member of the Tea Party?
- Mormon?“

Person Count Technique (PCT)

- Benefits of PCT (as compared to standard ICT):
  - One list of persons permits asking many sensitive items.
    → with ICT, a different item list is required for every sensitive item.
  - No fabrication of filler items needed.

- Possible drawbacks of PCT:
  - Floor and ceiling effects:
    - Likely to occur more often than with ICT.
    - Not easily controllable as with ICT.
  - Design effects:
    - We assume that answers regarding the k other persons do not differ between the experimental groups.
    - However, the respondent‘s status for the sensitive item might affect his assessment of the status of the three other persons.

Item Sum Technique (IST)

- Proposed by Trappman et al. (2014).
- Basic principles of IST:
  - Same setup as with ICT (two groups, randomization, etc.)
  - Short lists consists of one or more innocuous quantitative item(s).
  - Long list includes the same innocuous item(s) plus the quantitative sensitive item.
  - Respondents are asked to report the sum of the questions.
- Example from Trappmann et al. (2014):

Short-list group	Long-list group
• How high are your monthly costs for your apartment or your house […]?	• How high are your monthly costs for your apartment or your house […]? • On average, how much do you earn per month from undeclared work?

Item Sum Technique (IST)

- Calculation of a mean estimate of the sensitive item and its standard error:

$$\hat{\mu}_{IST} = \bar{Y}_{LL} - \bar{Y}_{SL}$$

$$SE(\hat{\mu}_{IST}) = \sqrt{Var(\bar{Y}_{LL}) + Var(\bar{Y}_{SL})}$$

PCT and IST: State of Research

- Besides the original studies (Grant et al., unpublished; Trappmann et al. 2014) no empirical research on the effectiveness of PCT and IST.

- Hypothesis of the following analyses:
  Due to the enhanced anonymity in PCT/IST format as compared to DQ format, we expect higher (lower) self-reports of socially undesirable (desirable) behavior and attitudes in PCT/IST formats and a reduction of item-nonresponse to the income question when using IST instead of DQ.

- Note that we rely on the „more-is-better-assumption“.

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	CATI survey	Mail survey	Web Survey
Sample	Random sample of landline telephone numbers in Mainz	Geographic random sample of households in Mainz	Convenience sample (snowball)
Field phase	autumn 2014	autumn 2016	summer 2015
Response rate	17% (RR2), 37% (COOP2)	29% (COOP2)	
N	499	571	525
Exp. Design	50% DQ, 50% IST	50% DQ, 50% IST/PCT	40% DQ, 60% PCT
Sensitive items	DQ-IST: income (NR) alcohol cons.	DQ-IST: income	
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Mail Survey: PCT design

- Long list group:

F27 **Nun geht es um die konkrete Situation in Mainz.**

Dabei werden wir eine spezielle Fragetechnik verwenden. Denken Sie hierzu bitte an drei möglichst verschiedene Personen aus Ihrem Freundes-, Bekannten- oder Verwandtenkreis, die Sie gut kennen, und die auch in Mainz wohnen. Sie können die Anfangsbuchstaben der Vornamen der drei Personen hier in die Felder schreiben, das macht die Sache leichter, aber Ihre Angaben bleiben anonym.

Anfangsbuchstaben meiner drei Personen: ☐ ☐ ☐

Nun werden einige Aussagen genannt, zu denen Sie einschätzen sollen, wie viele Ihrer drei Personen plus Sie selbst der jeweiligen Aussage zustimmen. Die Antwort ist also eine Zahl zwischen 0 (trifft auf keine der Personen zu) und 4 (trifft auf alle drei Personen und Sie selbst zu). Wenn Sie sich nicht sicher sind, können Sie auch raten, das ist kein Problem.

a) **„Ich fühle mich durch die Flüchtlinge in Mainz in meinem Alltag gestört“.**

Zahl der Personen, die zustimmen: ☐

b) **„Flüchtlinge sollten sich nicht in der Mainzer Innenstadt aufhalten, sondern in ihren Heimen bleiben“.**

Zahl der Personen, die zustimmen: ☐

Mail Survey: PCT design

An attempt to avoid ceiling effects

- Long list group:

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Mail Survey: PCT design

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Anfangsbuchstaben meiner drei Personen: ____ ____ ____

Nun werden einige Aussagen genannt, zu denen Sie einschätzen sollen, wie viele Ihrer drei Personen plus Sie selbst der jeweiligen Aussage zustimmen. Die Antwort ist also eine Zahl zwischen 0 (trifft auf keine der Personen zu) und 4 (trifft auf a
Wenn Sie sich nicht sicher sind, können Sie auch raten, da

a) **„Ich fühle mich durch die Flüchtlinge in Mainz in meinem A**

Zahl der Personen, die zustimmen: ____

b) **„Flüchtlinge sollten sich nicht in der Mainzer Innenstadt bleiben“.**

Zahl der Personen, die zustimmen: ____

Motivation:

- Avoid that respondents switch the people thought of in dependence of the question content or the respondent‘s own opinion.
- Pretests have shown this helps respondents.

Mail Survey: PCT design

An attempt to avoid ceiling effects

- Long list group:

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Anfangsbuchstaben meiner drei Personen: [ ] [ ] [ ]

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Zahl der Personen, die zustimmen: [ ]

b) **„Flüchtlinge sollten sich nicht in der Mainzer Innenstadt**
bleiben“.

Zahl der Personen, die zustimmen: [ ]

Nota bene: No motivation of PCT as „anonymizing technique for sensitive questions“ or the like.

Motivation:

- Avoid that respondents switch the people thought of in dependence of the question content or the respondent‘s own opinion.
- Pretests have shown this helps respondents.

Mail Survey: PCT design

Short-list group (3 people)

„How many of the three people would agree with the following statement“:

Long-list group (3 people + oneself)

„How many of the three people plus yourself would agree with the following statement“:

- „I feel bothered by the refugees in Mainz.“
- „Refugees should not stroll around in the city center of Mainz, but stay in their asylums.“
- „I feel bothered if refugees live in my neighborhood.“
- „The opening of a refugee asylum in my neigborhood would bother me.“

Web Survey: PCT design

- Comparable to the design in the CATI survey, but:
  - without the respondents being asked to write down the initial letters of their persons‘ names.
  - Introduction of PCT as „because the following questions might make some people feel uncomfortable, we are going to employ a special technique that guarantees you the maximum possible anonymity“.

Long List: „Da die folgenden Fragen für einige Menschen unangenehm sein können, werden wir nun eine spezielle Technik verwenden, die Ihnen größtmögliche Anonymität garantiert. Denken Sie bitte an drei Personen, die Sie gut kennen, die aber möglichst unterschiedlich sind (Sie müssen sie nicht nennen). Nun werden einige Verhaltensweisen und Einstellungen abgefragt, zu denen ich Sie bitte anzugeben, auf wie viele der Personen, Sie selbst eingeschlossen, diese zutreffen. Die Antwort ist also eine Zahl zwischen 0 (trifft auf keine der Personen zu) und 4 (trifft auf alle drei Personen und Sie selbst zu). Wenn Sie sich in Bezug auf die Verhaltensweisen der drei ausgesuchten Personen nicht sicher sind, können Sie auch raten.

Short List: „Im Folgenden werden wir eine spezielle Fragetechnik verwenden. Denken Sie hierzu bitte an drei Personen, die Sie gut kennen (Sie müssen sie nicht nennen). Nun werden einige Verhaltensweisen abgefragt, zu denen ich Sie bitte, anzugeben, auf wie viele der drei Personen diese zutreffen. Die Antwort ist also eine Zahl zwischen 0 (trifft auf keine der drei Personen zu) und 3 (trifft auf alle der drei Personen zu). Wenn Sie sich in Bezug auf die Verhaltensweisen der drei ausgesuchten Personen nicht sicher sind, können Sie auch raten.“

Web Survey: PCT design

Item	Wording (DQ)*
Marihuana consumption	Have you ever taken marihuana?
Cocaine consumption	Have you ever taken cocaine?
Voter turnout	Did you go voting in the last Bundestag elections?
Fare dodging	Have you ever dodged the fare using public transport?
Driving under the influence	Have you ever been riding a car or motorbike although you had drunk too much alcohol?
Shoplifting	Have you ever commited shoplifting?
Convicted	Have you ever been […] convicted under criminal law?
Anti-homosexual attitude	Would you feel bothered if your son/daughter would be homosexual?
Anti-foreigner attitude	Would you feel bothered if your son/daughter would marry a foreigner?
Anti-refugee attitude	Would you feel bothered if a refugee asylum would open in your neighborhood?

**Note: In PCT mode, the wording was: „How many of the three people including yourself ….“*

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CATI and Mail Survey: IST design

- Self-reported alcohol consumption (CATI survey only):

Short-list group

- On how many days during the last week did you do exercise?

Long-list group

- On how many days during the last week did you do exercise?
- On how many days during the last week did you drink alcohol?

- Income question (CATI & mail survey):

Short-list group

- How far is the next supermarket located from your place of residence?

Long-list group

- How far is the next supermarket located from your place of residence?
- What is the total amount of your average monthly net income?

CATI survey: IST design

Detailed question wording for the income question:

INT.: "The point of the next question is to analyze groups in the population with, for instance, a high, middle, or low income. Because many respondents, however, do not want to report their income in surveys, we are going to employ a special technique that anonymizes your income information completely.

In order to do so, you are simply going to answer two questions without telling me the answer. Each of these questions is answered with a number. Please memorize the answer to each of the two questions or note the answers on a sheet of paper. Then, add up your two answers and only tell me the result.

In so doing, your income information remains secret, because nobody knows how you arrived at your overall result. Also, our researchers at the university, can, later on, only calculate the average income for groups of respondents using special statistical methods.

The first question is: How far is the next supermarket located from your place of residence? Please estimate the approximate distance in meters without telling me the answer" (Interviewer instruction: on inquiry: "*Please consider only larger supermarkets, not kiosks, bread shops, and so on"*).

"The second question is: What is the total amount of your average monthly net income? Now you simply add up your answers to the first and second question and tell me the result"

(Interviewer instruction: Leave a break in order to let the respondent think. If problems arise, ask the respondent to get a pen and paper. Only on inquiry: *"Your average monthly net income is the sum of wage, salary, earnings from activities of a self-employed character, or pensions. Please also add income from social benefits, from letting or leasing, assets, housing and child allowances and other income, and subtract taxes and social security contributions."*

CATI survey: IST design

Detailed question wording for the alcohol question:

INT.: "For the next two questions we are, for the sake of anonymity, once more going to use the secure counting technique. The topic is getting exercise and alcohol consumption, because earlier, we have talked about being disturbed by drunken people.

So, again, I am going to read out two questions that you will please answer for yourself without telling me the answers. Then you will add up your answers again and state only the result to me. In so doing, your separate answers on the respective questions remain secret.

The first question is: On how many days during the last week did you do exercise?

And the second question is: On how many days during the last week did you drink alcohol?

Now you simply add up your answers to the first and second question and tell me the result." An item earlier in the questionnaire asked to what degree the respondent feels disturbed by "noise or other nuisances by drunken people in the public."

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Results: PCT Mail Survey

- Results of the mail survey (attitudes to refugees):
  Item nonresponse:

		Item 1	Item 2	Item 3	Item 4
DQ	% nonresp.	2,49	2,85	2,14	2,14
	N	281	281	281	281
PCT	% nonresp.	5,86	6,21	6,21	6,21
	N (LL)	290	290	290	290
χ^2 (df = 1)		4,03 *	3,71 +	5,88 *	5,88 *

Results: PCT Mail Survey

- Results of the mail survey (attitudes to refugees):
  Prevalence estimates:

		Item 1	Item 2	Item 3	Item 4
DQ	% “yes”	9,49	5,49	23,64	44,00
	s.e.	1,78	1,38	2,56	3,00
	N	274	273	275	275
PCT	% “yes”	30,18	16,21	31,29	52,89
	s.e.	9,51	7,29	9,35	10,54
	N (LL)	273	272	272	272
Diff		20,69	10,72	7,65	8,89
z		2,03 *	1,37	0,73	0,74

Note: I used suest and lincom (Stata) to account for the fact that DQ and PCT samples are not independent (DQ group also answered the short list).

Results: PCT Mail Survey

- Results of the mail survey (attitudes to refugees):
  Floor and ceiling effects (long list group only):

	Item 1	Item 2	Item 3	Item 4
% answering “0”	49,5	74,3	36,0	22,1
% answering “4”	7,0	3,3	6,3	15,1
N	273	272	272	272

Results: PCT Web Survey

- Results of the web survey:
  Prevalence estimates:

	DQ % yes	s.e.	PCT % yes	s.e.	z	N
Ever taken marihuana	56,0	3,8	43,4	12,2	0,88	446
Ever taken cocaine	13,7	2,6	0,66	7,3	1,50	446
Voted in Bundestag elections	69,9	3,5	60,5	10,2	0,80	440
Driving under the influence	30,3	3,5	30,4	9,9	0,01	440
Fare dodging	80,0	3,0	74,5	10,6	0,45	429
Shoplifting	36,2	3,7	37,3	9,1	0,10	436
Convicted under criminal law	8,0	2,1	8,6	5,1	0,10	435
Anti-homosexual attitudes	10,9	2,4	4,9	8,4	0,65	433
Anti-foreigner attitudes	4,6	1,6	10,7	7,1	0,78	429
Anti-refugees attitudes	19,6	3,0	15,3	9,3	0,40	429

Results: PCT Web Survey

- Results of the web survey:
  Floor and ceiling effects (long list group only):

	PCT % „0“	% „4“	N
Ever taken marihuana	26,2	**15,1**	271
Ever taken cocaine	77,9	**0,7**	271
Voted in Bundestag elections	**6,7**	32,2	267
Driving under the influence	34,3	**6,8**	265
Fare dodging	6,3	**39,8**	254
Shoplifting	45,4	**3,4**	262
Convicted under criminal law	79,2	**0,4**	260
Anti-homosexual attitudes	61,0	**2,3**	259
Anti-foreigner attitudes	71,1	**0,8**	256
Anti-refugees attitudes	52,6	**3,6**	253

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Sample	Random sample of landline telephone numbers in Mainz	Geographic random sample of households in Mainz	Convenience sample (snowball)
Field phase	autumn 2014	autumn 2016	summer 2015
Response rate	17% (RR2), 37% (COOP2)	29% (COOP2)	
N	499	571	525
Exp. Design	50% DQ, 50% IST	50% DQ, 50% IST/PCT	40% DQ, 60% PCT
Sensitive items	DQ-IST: income (NR) alcohol cons.	DQ-IST: income	
		DQ-PCT: attitudes to refugees (4 items)	DQ-PCT: various sensitive topics (10 items)

Results: IST

- Results: **item nonresponse:**

		CATI survey (alcohol consumption)
DQ	% nonresp.	0,8
	N	245
IST	% nonresp.	0
	N (LL)	254
χ^2 (df = 1)		2,08

Results: IST

- Results: **item nonresponse:**

		CATI survey (alcohol consumption)	CATI survey (income)
DQ	% nonresp.	0,8	21,2
	N	245	245
IST	% nonresp.	0	5,9
	N (LL)	254	254
χ^2 (df = 1)		2,08	25,18 ***

Results: IST

- Results: **item nonresponse:**

		CATI survey (alcohol consumption)	CATI survey (income)	Mail survey (income)
DQ	% nonresp.	0,8	21,2	8,9
	N	245	245	281
IST	% nonresp.	0	5,9	8,3
	N (LL)	254	254	290
χ^2 (df = 1)		2,08	25,18 ***	0,07

Results: IST

- Results: **mean estimates of sensitive items:**

		CATI survey (alcohol consumption)	CATI survey (income)	Mail survey (income)
DQ	mean	1,54		
	s.e.	0,11		
	N	243		
IST	mean	1,78		
	s.e.	0,22		
	N (LL)	254		
Diff		0,24		
z		0,98		

Note: I used suest and lincom (Stata) to account for the fact that DQ and PCT samples are not independent (DQ group also answered the short list).

Results: IST

- Results: **mean estimates of sensitive items:**

		CATI survey (alcohol consumption)	CATI survey (income)	Mail survey (income)
DQ	mean	1,54	2163,7	2108,5
	s.e.	0,11	156,3	122,27
	N	243	192	255
IST	mean	1,78	2285,0	2168,6
	s.e.	0,22	160,3	118,0
	N (LL)	254	239	266
Diff		0,24	121,3	60,1
z		0,98	0,54	0,35

Note: I used suest and lincom (Stata) to account for the fact that DQ and PCT samples are not independent (DQ group also answered the short list).

Outline

1. Introduction: Sensitive Questions in Surveys
2. The Item-Count-Technique (ICT) and Recent Advancements
   - Item-Sum-Technique (IST)
   - Person-Count-Technique (PCT)
3. Our Studies: Design and Variables
4. Results
5. Discussion

Discussion

- PCT:
  - PCT performs as expected in the mail survey.
  - With respect to the „more-is-better-assumption“, PCT not strikingly better than DQ (but not worse, too).
  - PCT is „brand new“, so we need more knowledge and experience about its properties:
    - statistical properties (power etc.)
    - design issues: Ceiling effects? Design effects?
      Asking respondents to write down their peoples‘ names seems to be a good idea.
- IST:
  - Encouraging results, especially with respect to the reduction of income nonresponse in the CATI survey.
- ICTs in general:
  - Main drawback: large standard errors / low statistical power.
  - Plus factors are that all PCT/IST designs worked well in the field. Respondents have no difficulties in coping with the demanded tasks.

Thank you for listening!

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ICT: State of Research

ICT better than direct questioning (DQ)?

- Meta analysis (7 studies) by Tourangeau & Yan (2007):
  Overall positive ICT effect, but not significant.
- Literature review by Wolter & Laier (2014):
  17 out of 22 studies with results at least partially in favor of ICT (plus our own study).

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„more-is-better-assumption“!

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„more-is-better-assumption“!

- (Aggregate) validation studies:
  - Comşa & Postelnicu (2013): Voting in the 2009 EU parliament election:
    - DQ estimate = 75%
    - ICT estimate = 65%
    - Actual turnout = 28% – 36 % (official and re-estimated turnout figures for the sample)
  - Rosenfeld et al. (2015): ICT better than DQ, but still off the true value.

Appendix

- Literature review by Wolter & Laier (2014):
  - 22 comparative ICT studies (including our own results).
  - ICT better than DQ: 10 studies
    mixed evidence where multiple items tested: 7 studies
    ICT = DQ: 3 studies
    ICT worse than DQ: 2 studies
  - 17 out of 22 studies (77%) with results at least partially in favor of ICT.

Appendix

- Distribution of answers for PCT-items in the mail survey:

	Item 1 (%)		Item 2 (%)		Item 3 (%)		Item 4 (%)	
	SL	*LL*	*SL*	*LL*	*SL*	*LL*	*SL*	*LL*
0	57	49	77	74	44	36	28	22
1	23	24	16	13	31	30	31	20
2	14	11	4	7	16	19	23	25
3	6	8	3	3	8	9	18	18
4		7		3		6		15
N	262	273	263	272	263	272	262	272

Results: PCT Mail Survey

- Results of the mail survey (attitudes to refugees):
  Item nonresponse:

		Item 1	Item 2	Item 3	Item 4
DQ	% NR	2,49	2,85	2,14	2,14
	N	281	281	281	281
PCT	% NR LL	5,86	6,21	6,21	6,21
	N	290	290	290	290
	% NR SL	6,76	6,41	6,41	6,76
	N	281	281	281	281
	% NR total	6,30	6,30	6,43	6,48
	N	571	571	571	571

(No significant differences between short list and long list).

Appendix

- Estimates for attitudes to refugees by gender (mail-survey):

		Item 1		Item 2		Item 3		Item 4	
		male	*female*	*male*	*female*	*male*	*female*	*male*	*female*
DQ	%	11,9	5,6	4,8	4,9	26,4	20,0	48,0	39,3
	s.e.	2,9	1,9	1,9	1,8	4,0	3,3	4,5	4,1
	N								
IST	%	46,6	21,1	29,9	7,4	46,2	25,7	65,9	48,3
	s.e.	14,6	12,6	11,5	9,3	14,5	12,1	15,5	14,4
	N								
Diff		34,7	15,5	25,1	2,5	19,8	5,7	17,9	8,9
z		2,2*	1,17	2,1*	0,3	1,2	0,4	1,0	0,6

Appendix

- Response rates of the CATI survey:

	N	% Total	% Eligible
Total sample	7,350	100	
Not Eligible:			
Non-working/disconnected number	3,901	53.07	
Other	545	7.42	
Unknown Eligibility, Non-Interview:			
No answer, other (incl. technical problems, etc.)	1,344	18.29	
Eligible, Non-Interview:			100
Refusal	771	10.49	49.42
Telephone answering device, other, break-off	290	3.95	18,59
Interview:			
Partial	5	0.07	0.32
Complete	494	6.72	31.67

Results: IST

- Results: **item nonresponse:**

		CATI survey (alcohol consumption)	CATI survey (income)	Mail survey (income)
DQ	% NR	0,8	21,2	8,9
	N	245	245	281
IST	% NR LL	0	5,9	8,3
	N (LL)	254	254	290
	% NR SL	0	0	2,14 **
	N (SL)	245	245	281
	% NR (total)	0	3,41	5,25
	N (total)	499	499	571

*Note: Stars designate significant differences between short list and long list. ** $p < 0,01$.*

Appendix

		Mean
Income	Short list (distance supermarket)	588.99
	Long list	2874.00
Alcohol Consumption	Short list (days exercises)	1.78
	Long list	3.56

Appendix

- Estimates for alcohol consumption by gender and education (CATI-survey):

		Male	Female	Low education	High education
DQ	mean	1,75	1,32	1,14	1,74
	s.e.	0,18	0,13	0,16	0,14
	N	97	141	78	163
IST	mean	2,56	1,11	0,95	2,29
	s.e.	0,35	0,27	0,38	0,26
	N	109	136	88	161
Diff		0,81	−0,21	−0,19	0,55
z		1,96 *	0,71	0,45	1,82 +

Appendix

- Sociodemographics in the CATI survey:

Table 2: Descriptive Characteristics of Respondents

	All	DQ	IST	χ^2/t	n
Gender (0 = male, 1 = female)	57.44	59.41	55.51	0.75	484
Age	50.42	48.74	52.08	2.22 *	491
Employed (0 = no, 1 = yes)	55.58	59.26	52.00	2.63	493
Years of education	13.90	13.96	13.84	0.37	490
Housing situation: rental (0 = no/owner, 1 = yes)	47.27	48.56	46.03	0.32	495

Note: DQ = direct questioning, IST = item sum technique. In order to test for significant differences between DQ and ICT, χ^2 tests were used for categorical variables and t tests (assuming equal variances) for quantitative variables. Data: Wolter and Schiener (2014).

DQ Alkohol	Freq.	Percent	Cum.
0	85	34.98	34.98
1	59	24.28	59.26
2	47	19.34	78.60
3	25	10.29	88.89
4	12	4.94	93.83
5	4	1.65	95.47
7	11	4.53	100.00
Total	243	100.00	

IST Alkohol/DQ Sport	Fragebogenversion DQ	ICT	Total
0	87	38	125
1	37	19	56
2	55	44	99
3	29	44	73
4	13	38	51
5	8	18	26
6	2	20	22
7	14	10	24
8	0	5	5
9	0	5	5
10	0	6	6
11	0	3	3
12	0	1	1
14	0	3	3
Total	245	254	499

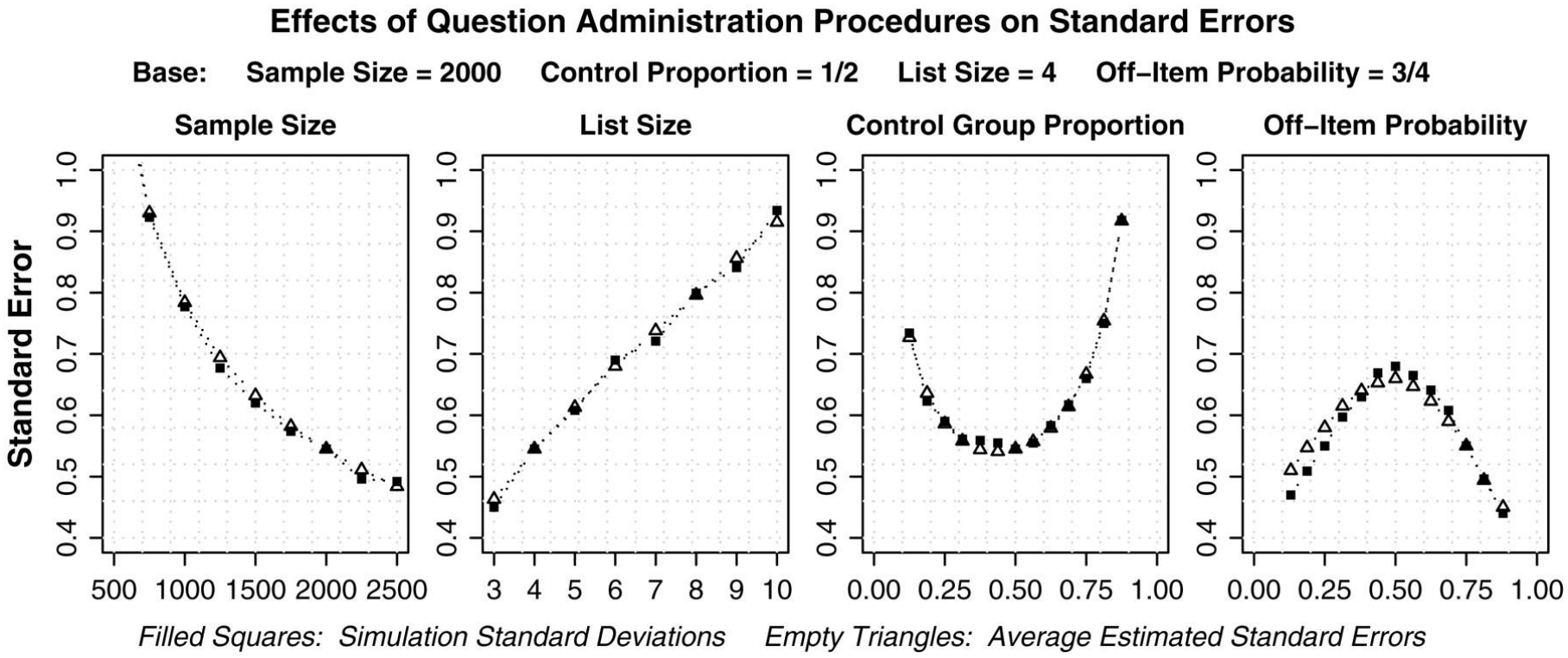
```
. gen notiert = (f27name1~="" & f27name2~="" & f27name3~="")

. tab notiert, mis
```

notiert	Freq.	Percent	Cum.
0	93	16.29	16.29
1	478	83.71	100.00
Total	571	100.00	

Statistical Power of ICT

- Simulations by Corstange (2009: 53):



Practicability/understanding of ICT

- A test question in our 2014 CATI survey:

INT: [After an introduction and explanation of the ICT procedure]:
„We are first going to do a simple and funny example in order to practice things. How many of the following tongue-in-cheek questions do apply to you?

- Were you born at the north pole?
- Do you live in the … district? [note: this question had been posed earlier in the interview]
- Is your name Donald Duck?
- [Have you ever been on the Mars?] [note: this item figures only in the long-list group]
- Are you younger than 100 years?

„How many questions did you answer with ‚yes'?"

Practicability/understanding of ICT

- A test question in our 2014 CATI survey:

- Results:

ICT Test	Freq.	Percent	Cum.
1	13	2.63	2.63
2	476	96.16	98.79
3	5	1.01	99.80
4	1	0.20	100.00
Total	495	100.00	

  - no relationship between misunderstanding of ICT and gender, nationality, age, education, and employment status.