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**Reducing Response-Order Effects in Check-All-That-Apply
Questions by Use of Dynamic Tooltip Instructions**

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Reducing Response-Order Effects in Check-All-That-Apply Questions by Use of Dynamic Tooltip Instructions

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Background

Check-all-that-apply questions in Web surveys



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- Check-all-that-apply questions allow respondents to select multiple answers to one question
 - Problem of response-order effects as kind of satisficing behavior
 - Respondent's motivation as a key factor to prevent satisficing
 - Prevention of response-order effects:
 - Randomization of items
 - Forced-choice question formats
 - Motivating instructions

Previous Findings

Dynamic tooltip instructions in Web surveys



- Effectiveness of clarifying information (definitions, instructions, examples) mainly depends on:
 - (a) attracting the respondent's attention,
 - (b) without increasing the effort required to obtain additional information.

 - Enhancing respondent's attention to clarifying information by
 - (a) providing information exactly when respondents need it (Dillman, 2000)
 - (b) dynamic 'respondent-initiated' presentation ('on demand')
 - is more effective when the effort for retrieval is low
(Conrad et al., 2006)
 - gets less attention than static information ('always visible')
(Conrad, Schober, & Coiner, 2007; Galesic et al., 2008; Peytchev et al., 2010)
- ➔ Here: dynamic 'system-initiated' tooltip instruction for prevention of response-order effects in check-all-that-apply questions.

Dynamic Tooltip Instruction

Screenshot



Which of the following statements best apply personally to you?
Please consider all statements when answering.

For me personally, the internet is:

Please consider all
statements when answering.

- support on my work
- medium offering fast communication
- useful medium
- possibility to find answers
- has become indispensable
- alternative to the telephone
- completely unnecessary
- danger to me
- annoying and cumbersome
- danger to society
- opportunity to meet people
- new territory
- alternative to books, reference works, etc.

Research Questions



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1. Are motivating instructions effective in reducing response-order effects in check-all-that-apply questions?
 2. Compared to conventional static instructions, is the use of a dynamic 'system-initiated' tooltip instruction more effective when appearing
 - a. exactly at the time the information is needed,
 - b. without any additional effort, and
 - c. inevitably if a respondent decides to answer.
 3. Is there an increased effect of combining a static and dynamic instruction?

Methods

Web survey



- Sample: university applicants (n=5.977)
- Field phase: 04.-30.08.2012
- Response rate (AAPOR RR2): 32%

- Design: 2 x 4 between-subjects experiment (randomly assigned)

item order

original
reverse

instruction type

no instruction
static instruction
dynamic tooltip instruction
static & dynamic instruction combined

- Topic: Attitude towards the Internet (list of 13 items)

Results

Mean number of items quoted



Mean number of items quoted, by order and instruction type

item order	instruction type				total (n)
	none	static	tooltip	static & tooltip	
original	5.2	5.1	5.3	5.2	5.2 (1482)
reverse	5.6**	5.7***	5.5	5.6**	5.6 (1471)
total (n)	5.4 (725)	5.4 (744)	5.4 (733)	5.4 (751)	5.4 (2953)

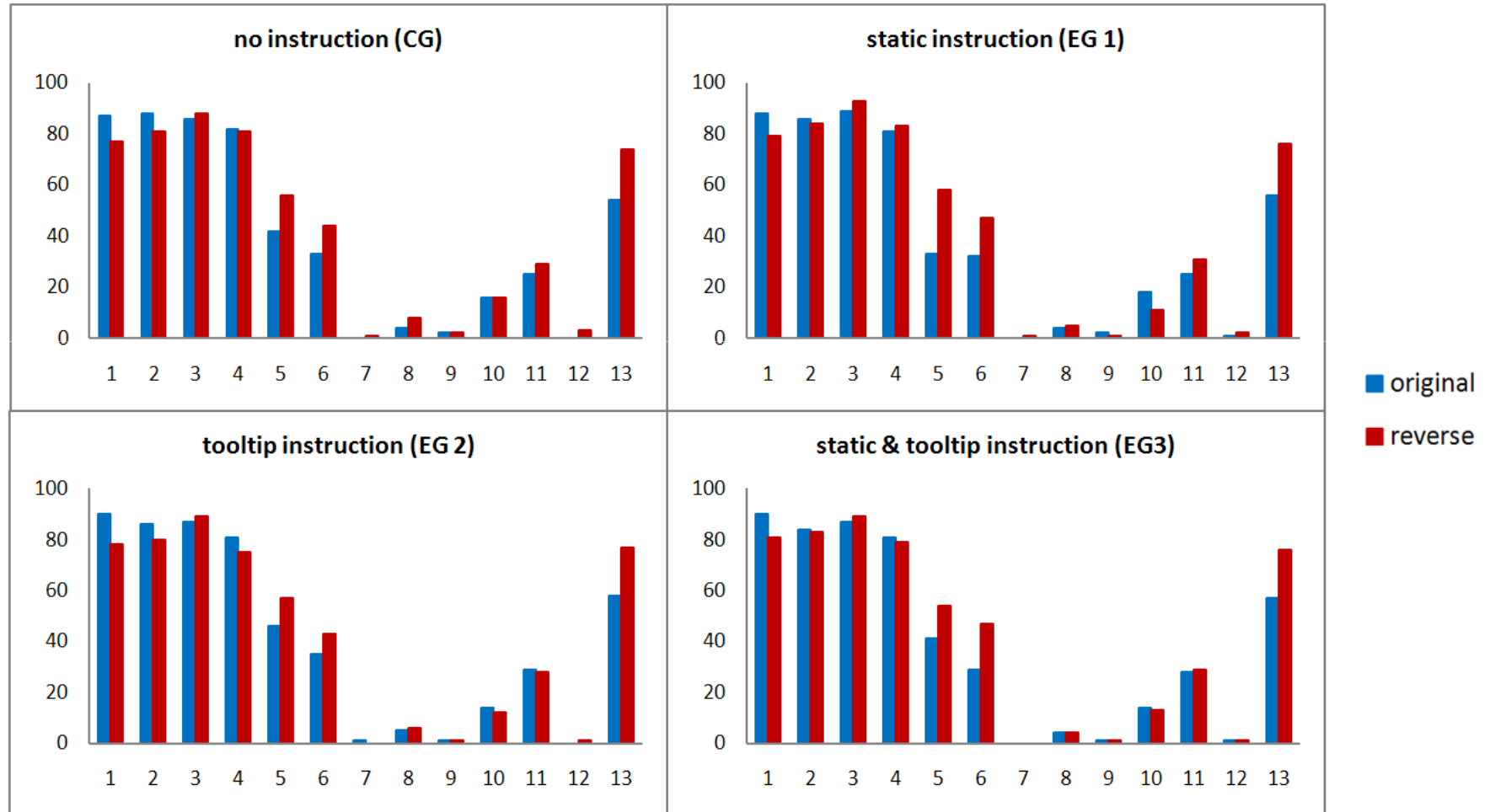
Notes: Analysis restricted to respondents with at least one item selected; item order: pairwise comparison
 *** $p < .001$, ** $p < .01$.

Results

Percent of each item quoted by order and instruction type

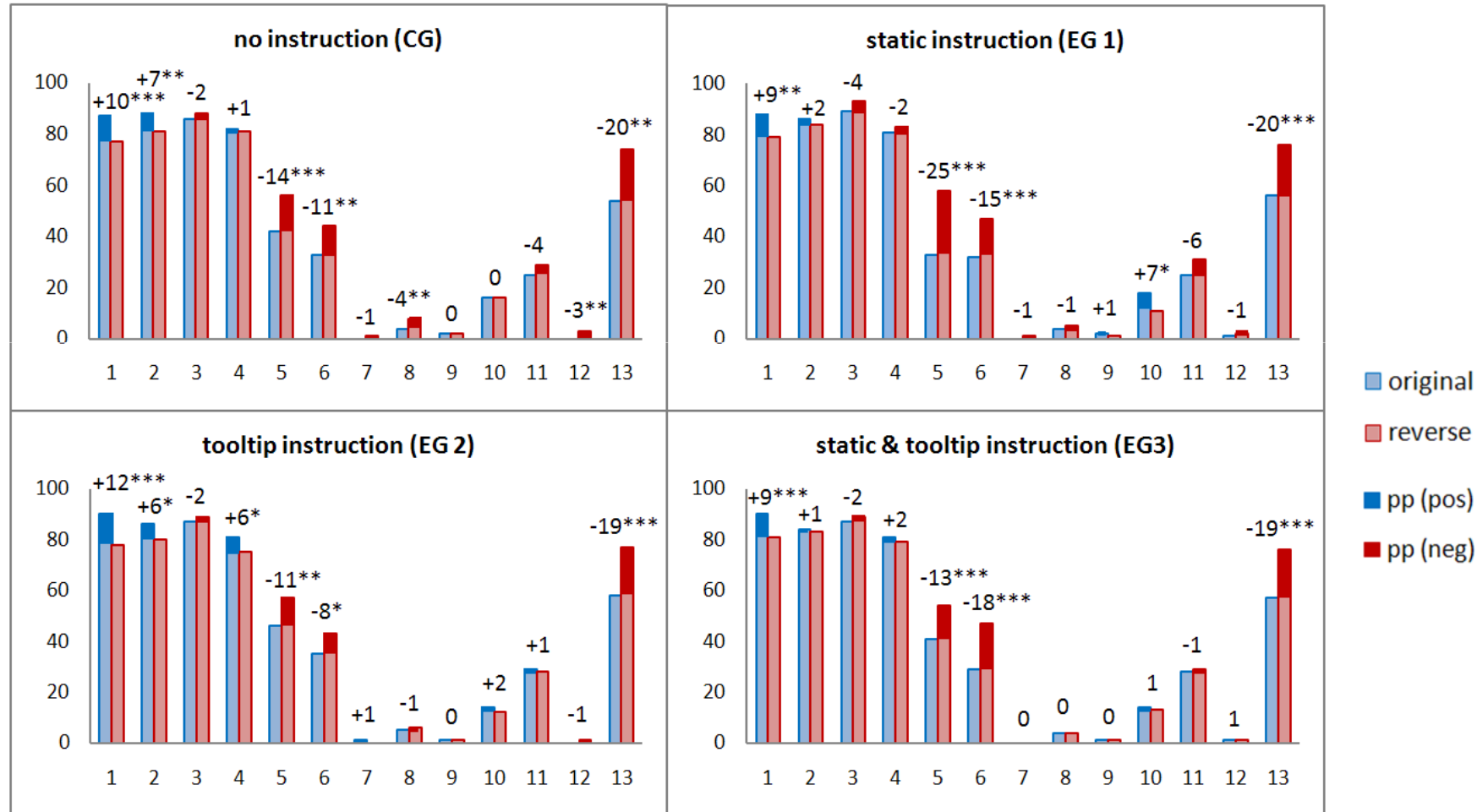


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Results

Response-order effects on item level (pp), by instruction type



Results

Average response-order effects



Mean number of items quoted within top and bottom half of the list, by order and instruction type

	instruction type							
	none		static		tooltip		static & tooltip	
	top	bottom	top	bottom	top	bottom	top	bottom
item order – all items¹⁾								
original	4.2	1.0	4.1	1.1	4.3	1.1	4.1	1.0
reverse	4.3	1.3***	4.4***	1.3***	4.2	1.3**	4.3*	1.3**
item order – 4 items (first 2, last 2)								
original	1.8	0.5	1.7	0.6	1.8	0.6	1.7	0.6
reverse	1.6***	0.8***	1.6*	0.8***	1.6***	0.8***	1.6*	0.8***

Notes: Analysis restricted to respondents with at least one item selected; ¹⁾ Analysis restricted to the first 6 items (top) and the last 6 items (bottom), item #7 excluded due to a prevalence close to zero; item order: pairwise comparison
 *** p<.001, ** p<.01, * p<.05.

Results

Response-order effects: number of significant differences



Number of significant differences between percent of items quoted in original vs. reverse order, by instruction type and number of items quoted (in total, below and above the mean)

	instruction type			
	none	static	tooltip	static & tooltip
# of items quoted ¹⁾	1+	1+	1+	1+
all items	7	5	6	4
4 items (first 2, last 2)	4	2	3	2

Notes: ¹⁾ Analysis restricted to respondents with at least one item selected (1+), with 5 or less (≤ 5) or with more than 5 items selected (>5) due to a median of 5.

Results

Response-order effects: number of significant differences



Number of significant differences between percent of items quoted in original vs. reverse order, by instruction type and number of items quoted (in total, below and above the mean)

# of items quoted ¹⁾	instruction type											
	none			static			tooltip			static & tooltip		
	1+	≤ 5	>5	1+	≤ 5	>5	1+	≤ 5	>5	1+	≤ 5	>5
all items	7	4	5	5	4	5	6	5	3	4	5	2
4 items (first 2, last 2)	4	3	2	2	3	2	3	3	1	2	3	1

Notes: ¹⁾ Analysis restricted to respondents with at least one item selected (1+), with 5 or less (≤ 5) or with more than 5 items selected (>5) due to a median of 5.

Results

Mean response times



Mean response times in seconds, by order and instruction type

item order	instruction type			
	none (a)	static (b)	tooltip (c)	static & tooltip (d)
original	31 ^{c,d}	34 ^{c,d}	37 ^{a,b}	38 ^{a,b}
reverse	34 ^{** ,d}	34 ^d	39	42 ^{a,b}

Notes: Analysis restricted to respondents with at least one item selected, cases excluded with a deviation of ± 2 std.dev. from group mean; item order: pairwise comparison * $p < .05$ or less, instruction type: ^{a,b,c,d} $p < .05$ or less.

Results

Response-order effects: number of significant differences depending on response time



Number of significant differences between percent of items quoted in original vs. reverse order, by instruction type and response time (below and above the mean)

response time ¹⁾	instruction type							
	none		static		tooltip		static & tooltip	
	≤mean	>mean	≤mean	>mean	≤mean	>mean	≤mean	>mean
all items	6	6	5	4	5	3	4	3
4 items (first 2, last 2)	3	4	2	1	3	2	2	1

Notes: Analysis restricted to respondents with at least one item selected; ¹⁾ response time below group mean (≤mean) or above (>mean).

Result Overview



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- In general, motivating instructions help reducing response-order effects on item level in check-all-that-apply questions to some degree without increasing the number of items selected or changing overall response distribution.
 - Concerning dynamic tooltip instructions:
 - Average response-order effects are not reduced by means of dynamic tooltip instructions.
 - The number of significant response-order effects on item level is slightly reduced due to tooltip instruction and considerably reduced by a combination of static and dynamic instruction.
 - This applies in particular to respondents who select a high number of items.
 - Mean response times are increased which is associated with a decrease in the number of significant response-order effects on item level.

Conclusions



- Dynamic tooltip instructions are an effective method to reduce response-order effects in check-all-that-apply questions.
- Dynamic tooltip instructions encourage deeper cognitive processing and more careful responding reflected in increased response times.
- Dynamic tooltip instructions are especially recommended for longer item lists.
- Dynamic tooltip instructions are most effective in combination with conventional static instructions.



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Thank you.

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