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Instant Interactive Feedback in Grid Questions: Insights from Eye Tracking Data

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Interactive Feedback

Background



- Grid questions are especially prone to various satisficing behaviors (e.g., nondifferentiation, speeding).
- Interactive feedback may prevent satisficing behaviors in Web surveys.
- Interactive feedback is most useful (Conrad et al., 2005):
 - ➔ when it is provided immediately after the relevant action, and
 - ➔ when no additional effort is required to obtain the feedback.
- Interactive feedback can be provided either
 - (1) after a respondent has already submitted a grid ('delayed feedback'), or
 - (2) while a respondent is still in the process of answering grid items ('instant feedback').

Instant Interactive Feedback

Previous Findings



→ Delayed feedback

- speed prompts (Conrad et al., 2011; Hudson et al., 2013):
longer response times; mixed findings on straight-lining and survey breakoff
- speed & nondifferentiation prompts in grid questions (Zhang, 2013):
reduction of speeding and nondifferentiation by either prompt

→ Instant feedback

- speed & nondifferentiation prompts in grid questions (Kunz & Fuchs, 2014):
both prompts reduced speeding and nondifferentiation; no increase of item nonresponse or survey breakoff

Suggestions:

Instant feedback encourages meaningful instead of superficial behavioral changes.

Research Questions



1. How effective is instant feedback in reducing speeding and nondifferentiation in grid questions?

2. How much attention is given to instant feedback?
 - a. one-off or repeated attention?
 - b. conscious or superficial awareness?

3. How does instant feedback affect the processing of grid questions?

Methods



- Lab experiment:
 - „Studies and Occupation“ Web survey (Jan/Feb, 2013)
 - Students recruited on campus (N=124)
 - Between-subjects design with random assignment
(with 26 of 39 survey questions being part of experimentation)

- Eye tracking equipment:
 - Monocular, remote mounted eye tracking system
 - 19 inch monitor
 - 60 Hz sampling rate

Design

Experimental Conditions

In your view, how important are the following aspects for an employer's decision to employ a graduate?

	very important	important	quite important	partly/ partly	quite unimportant	unimportant	very unimportant
subject of study	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
specialization	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
thesis	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
degree (i.e., Bachelor, Master, Diploma, Doctorate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
final grade	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
practical experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Feedback Instruction
(Q28, 14 items)

CG: No feedback

EG: Nondiff prompt
nondiff (click_i) < .60
(McCarty&Shrum, 2010)

Please try to
differentiate more
between your
answers.

How important are the following job aspects for you personally?

	very important	important	quite important	partly/ partly	quite unimportant	unimportant	very unimportant
flexible working hours	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
sufficient time for leisure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
to be stimulated by daily challenges	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
sufficient time for my family	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
to be faced repeatedly with new tasks	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Feedback Instruction
(Q33, 14 items)

CG: No feedback

EG: Speed prompt
time span (click_i – click_{i-1}) <
3500ms

Please take
some more time
for your answer.

Results

Survey Data I

	Feedback Instruction	n	Nondifferentiation (McCarty & Shrum)	Response Time (Seconds)
Q28	no prompt	41	.704	60.9
	nondiff prompt	52	.739	68.6
	<i>F-test</i>		< .05	< .05
Q33	no prompt	48	.678	58.8
	speed prompt	39	.703	93.3
	<i>F-test</i>		<i>ns</i>	< .001

➔ Both feedback instructions reduced nondifferentiation and speeding.

Results

Survey Data II



	Feedback Instruction	n	mean index	F-test
Q28	no prompt	41	2.79	<i>ns</i>
	nondiff prompt	52	2.91	
Q33	no prompt	48	2.67	<i>ns</i>
	speed prompt	39	2.73	

➔ Both feedback instructions did not affect substantive responses.

Eye Tracking Data

Areas of Interest (AOI)

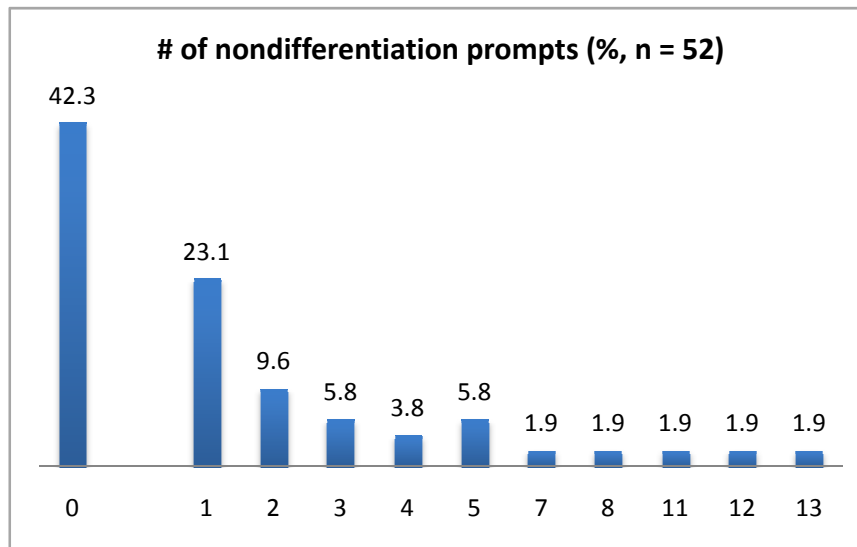
In your view, how important are the following aspects for an employer's decision to employ a graduate?

	very important	important	quite important	partly/ partly	quite unimportant	unimportant	very unimportant
subject of study	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
specialization	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
thesis	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
degree (i.e., Bachelor, Master, Diploma, Doctorate)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
final grade	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
practical experience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Please try to
differentiate more
between your
answers.

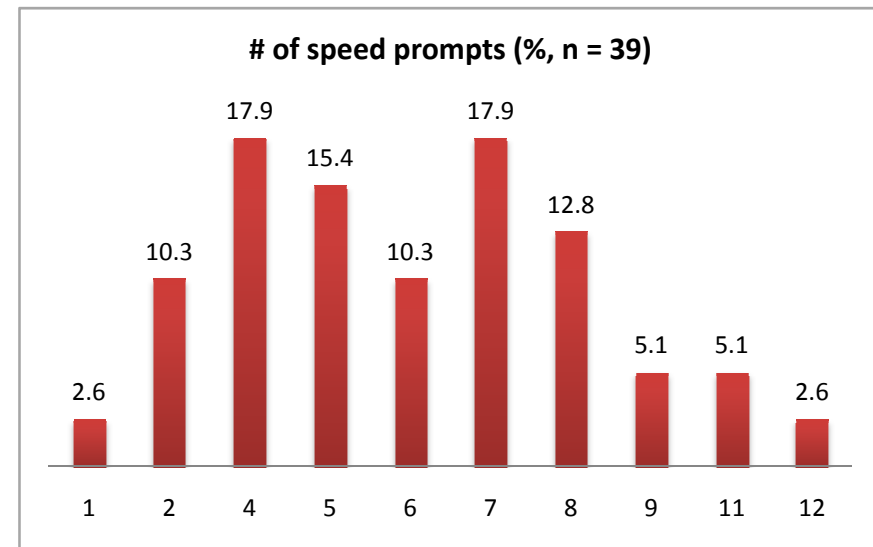
Results

Incidence of Prompts (Percent)



58 percent of the respondents received at least 1 prompt.

On average, 3.5 prompts appeared for those who received at least 1 prompt.

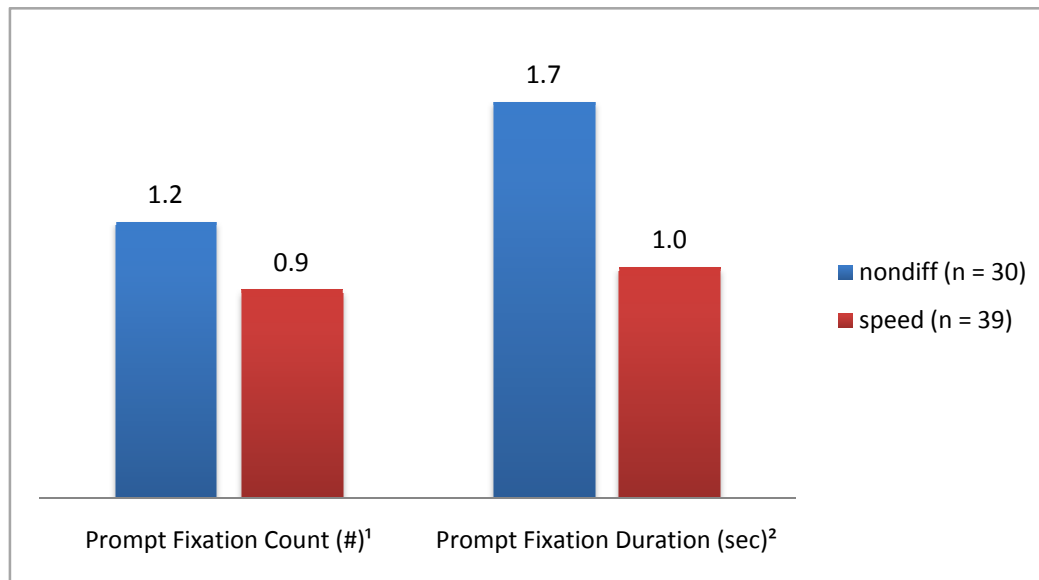


100 percent of the respondents received at least 1 prompt.

On average, 5.9 prompts appeared.

Results

Respondent Attention to Prompts (overall, mean)



Overall, 92 percent of the respondents fixated the speed prompt at least once compared to 70 percent the nondiff prompt.

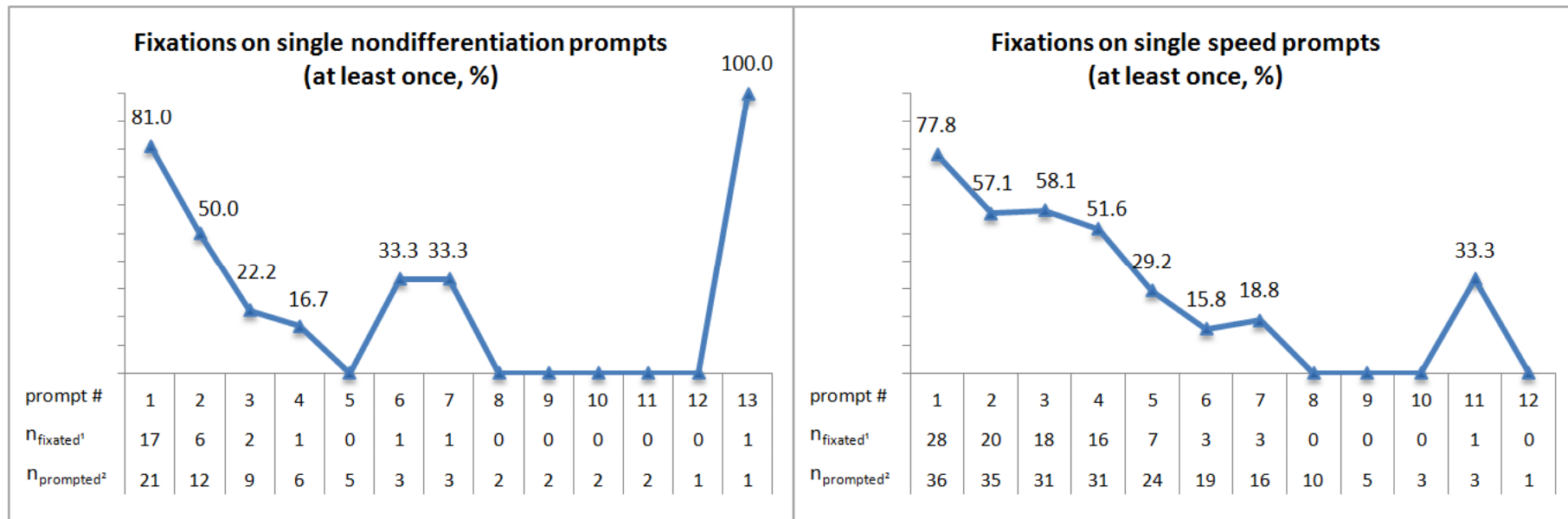
Provided that a prompt was fixated at all, a nondiff prompt was fixated more frequently and longer than a speed prompt.

Note. Fixation counts and durations were divided by the total number of prompts.

¹) Respondents completely ignoring the prompts (9 for nondiff and 3 for speed) were included in the calculation of mean fixation count, but ²) excluded from calculations of mean fixation duration.

Results

Respondent Attention to Prompts (single, mean)



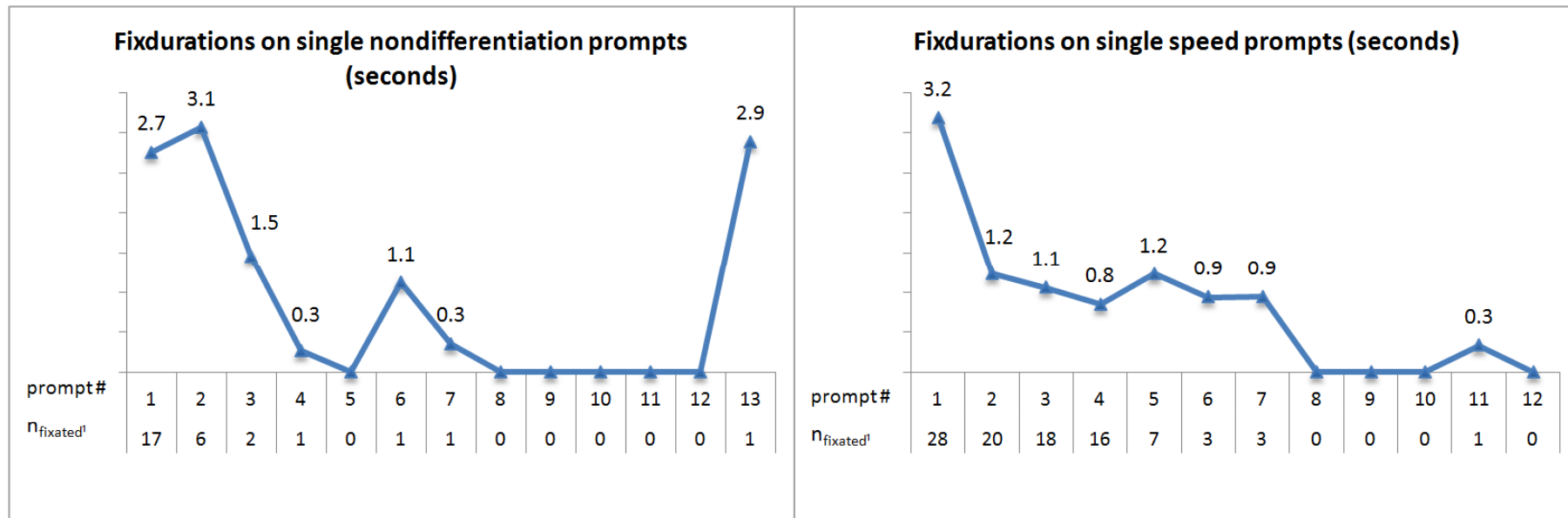
Note. ¹⁾ Number of respondents who fixated the 1st, 2nd, 3rd, etc. prompt at least once; ²⁾ Number of respondents who received a 1st, 2nd, 3rd, etc. prompt at all.

➡ One-off attention to nondiff prompts

➡ Repeated attention to speed prompts

Results

Respondent Attention to Prompts (single, mean)



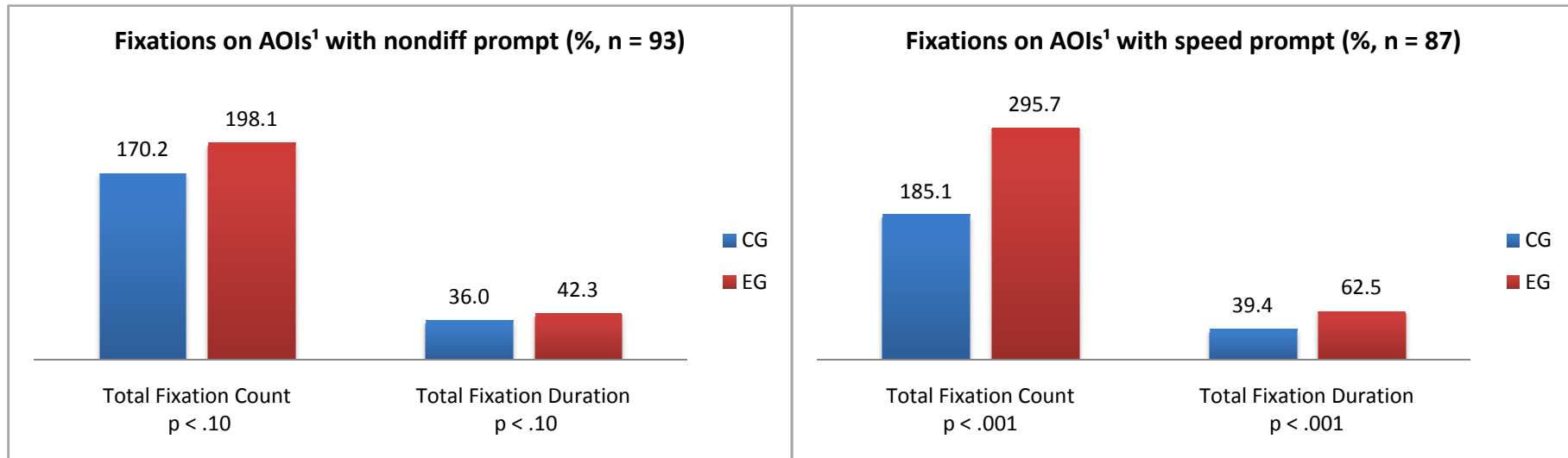
Note. ¹) Number of respondents who fixated the 1st, 2nd, 3rd, etc. prompt at least once.

➡ One-off attention to nondiff prompts

➡ Repeated attention to speed prompts

Results

Respondent Attention to AOIs (overall, mean)

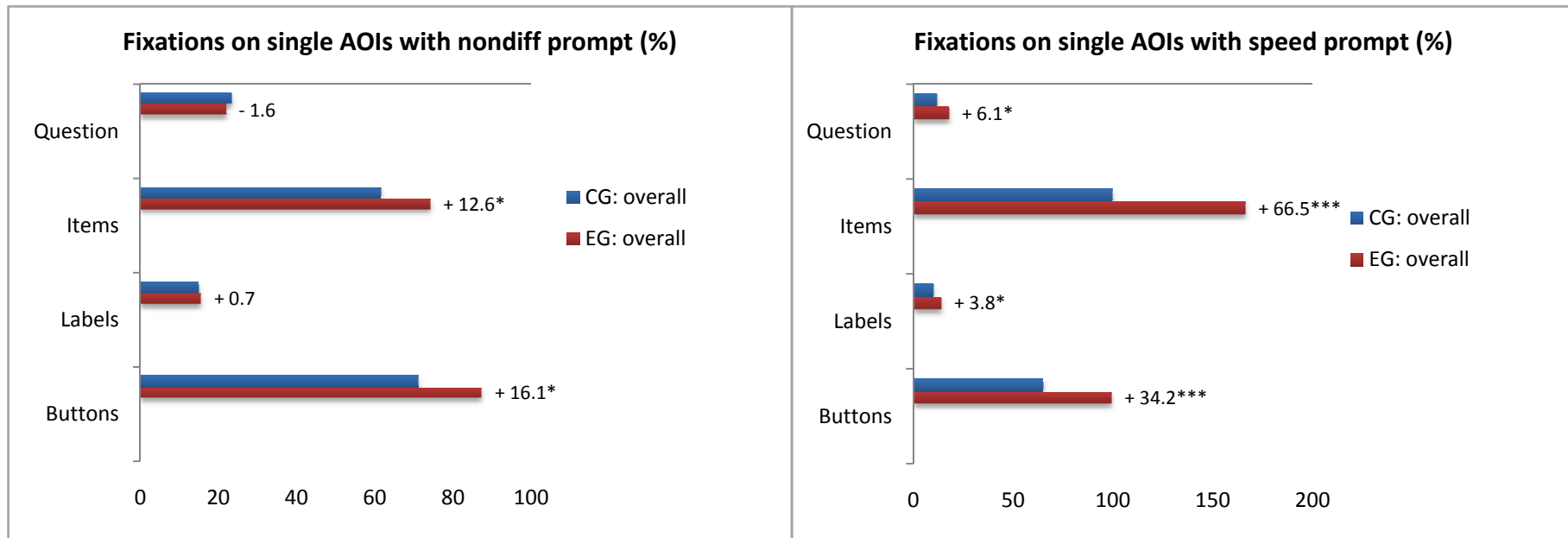


Note. ¹) AOIs 'question text', 'items', 'response option labels', and 'radio buttons' were included in the analysis.

➔ Respondent attention to relevant question components was increased due to both feedback instructions.

Results

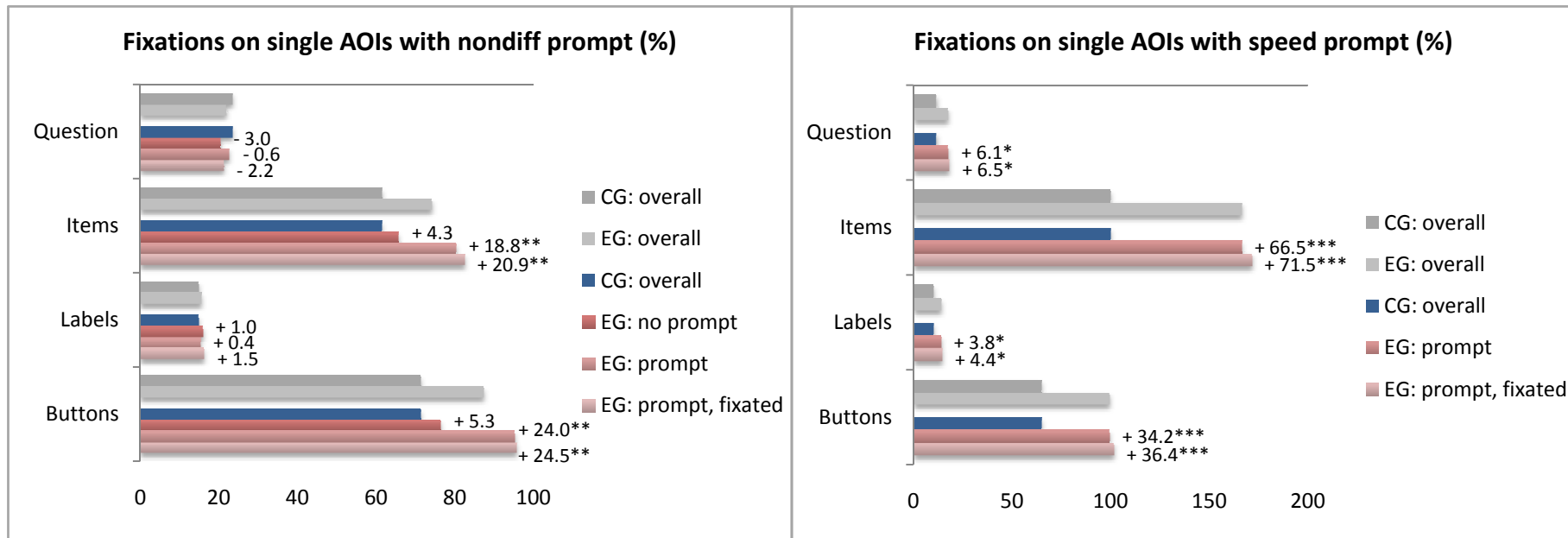
Respondent Attention to AOIs (single, mean)



Note. *** $P < .001$, ** $P < .01$, * $P < .05$.

Results

Respondent Attention to AOIs (single, mean)

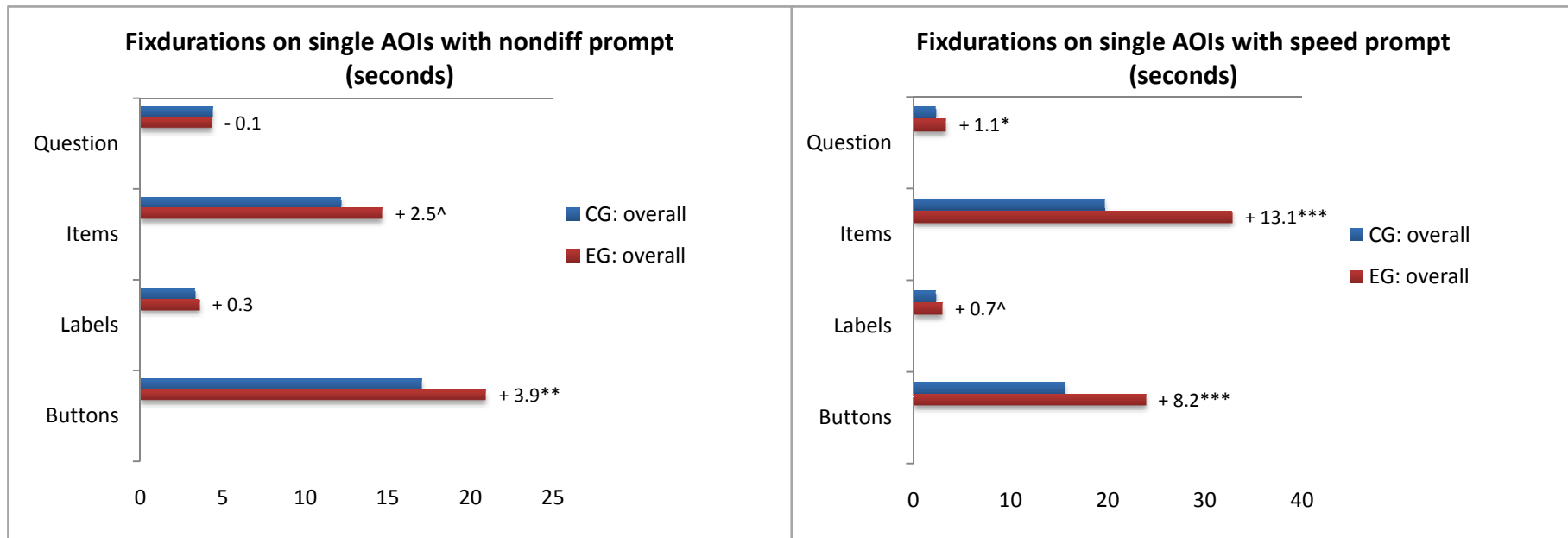


Note. *** $P < .001$, ** $P < .01$, * $P < .05$.

➔ Both feedback instructions encouraged respondents to pay more attention to the items and the radio buttons.

Results

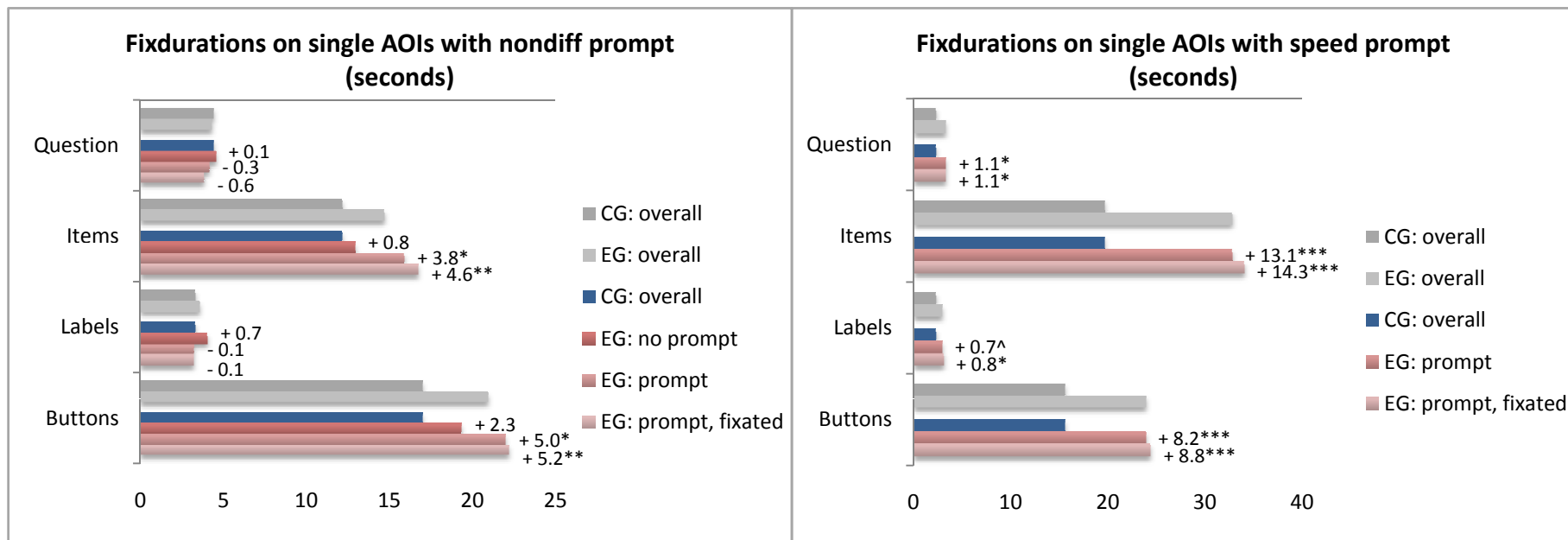
Respondent Attention to AOIs (single, mean)



Note. *** $P < .001$, ** $P < .01$, * $P < .05$, [^] $P < .10$.

Results

Respondent Attention to AOIs (single, mean)



Note. *** $P < .001$, ** $P < .01$, * $P < .05$, ^ . $P < .10$.

➔ Both feedback instructions encouraged respondents to concentrate longer on the items and the radio buttons.

Results

Summary



Survey data revealed:

1. Nondifferentiation and speeding could efficiently be reduced by means of instant feedback on either nondifferentiation or speeding.
2. Substantive responses remained unaffected by feedback instructions.

Eye tracking data indicated:

1. Respondents' attention to the nondifferentiation prompts was one-off and induced higher attention to item content and radio buttons.
2. Respondents' attention to the speed prompts was repeated and encouraged higher attention to all relevant components of a survey question.

Conclusions



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- ➔ Overall respondent attention to instant feedback is considered high.
 - ➔ Respondent attention to speeding feedback is more pronounced than their attention to nondifferentiation feedback.
 - The effectiveness of repeated nondifferentiation prompting is limited.
 - Instant feedback on speeding is more effective with increasing incidence of prompting.
 - ➔ Instant feedback on nondifferentiation and speeding promotes higher respondent attention to grid questions.
 - ➔ More precisely, respondents are encouraged to consider the content of the items and their own responses more carefully.



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Thank you.

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