The impact of font on typo detection: a novel visual search paradigm

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Introduction

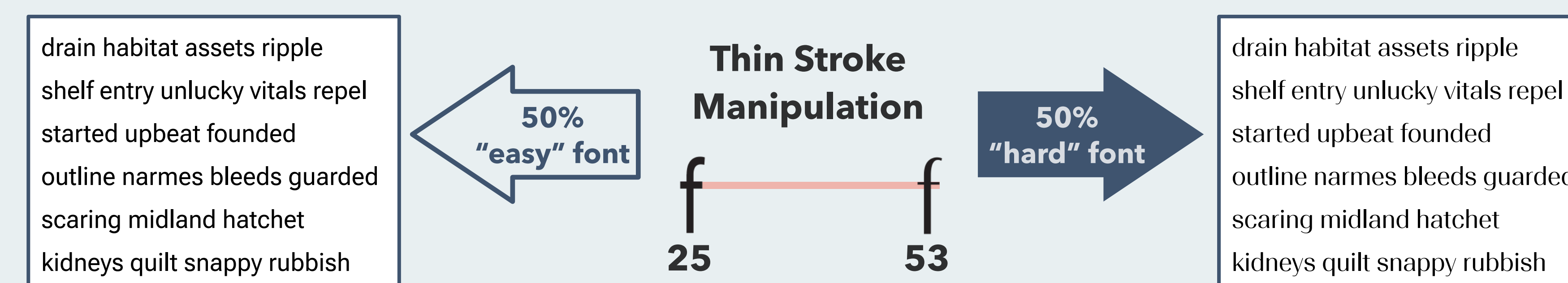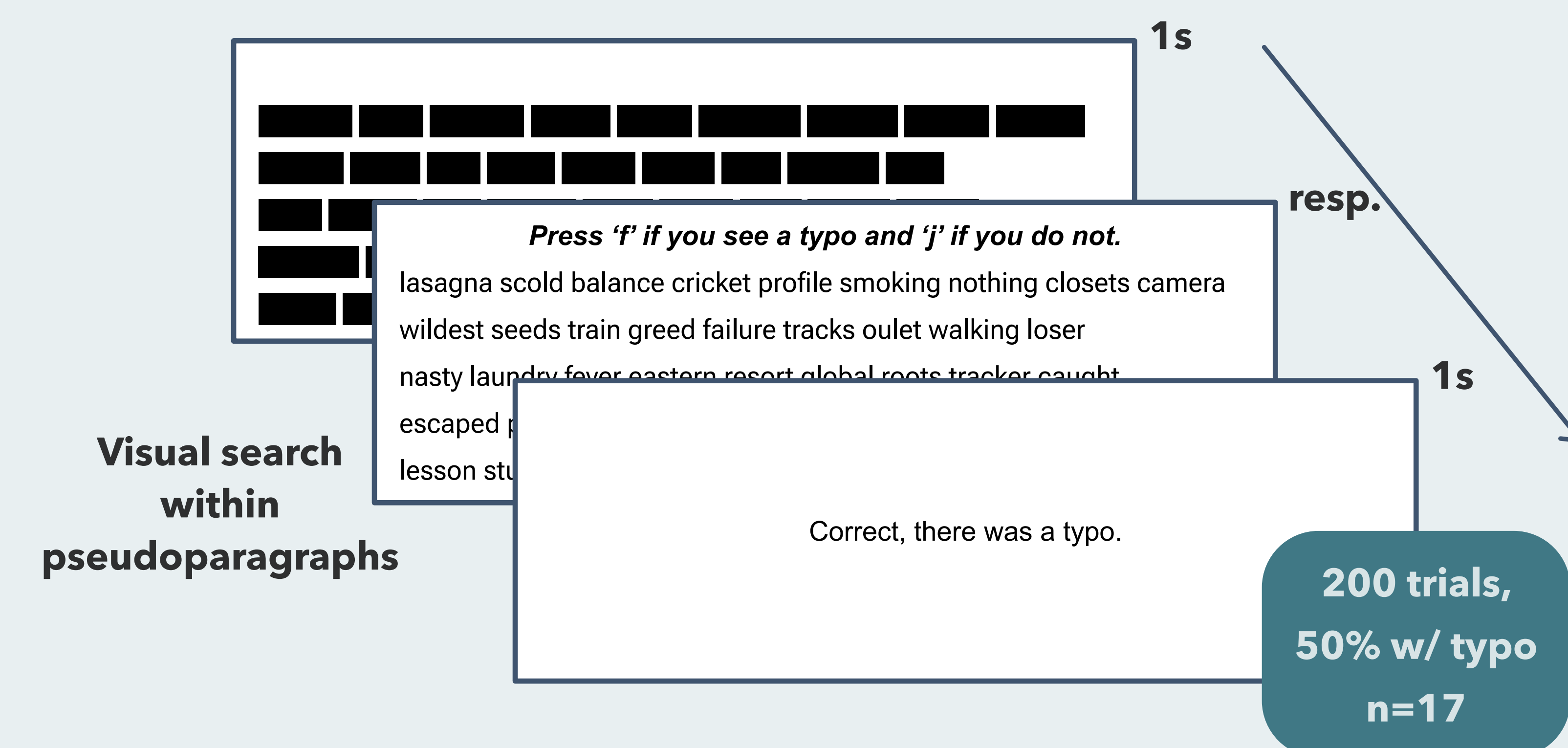In visual search tasks, we scan our enviroment to identify a target.

"Look but fail to see" (LBFTS) errors ocur when we can clearly see, but fail to to respond to, this target[1].

Typo detectjon is an everyday task we can use to explore factors that lead to success and failure in viisual search.

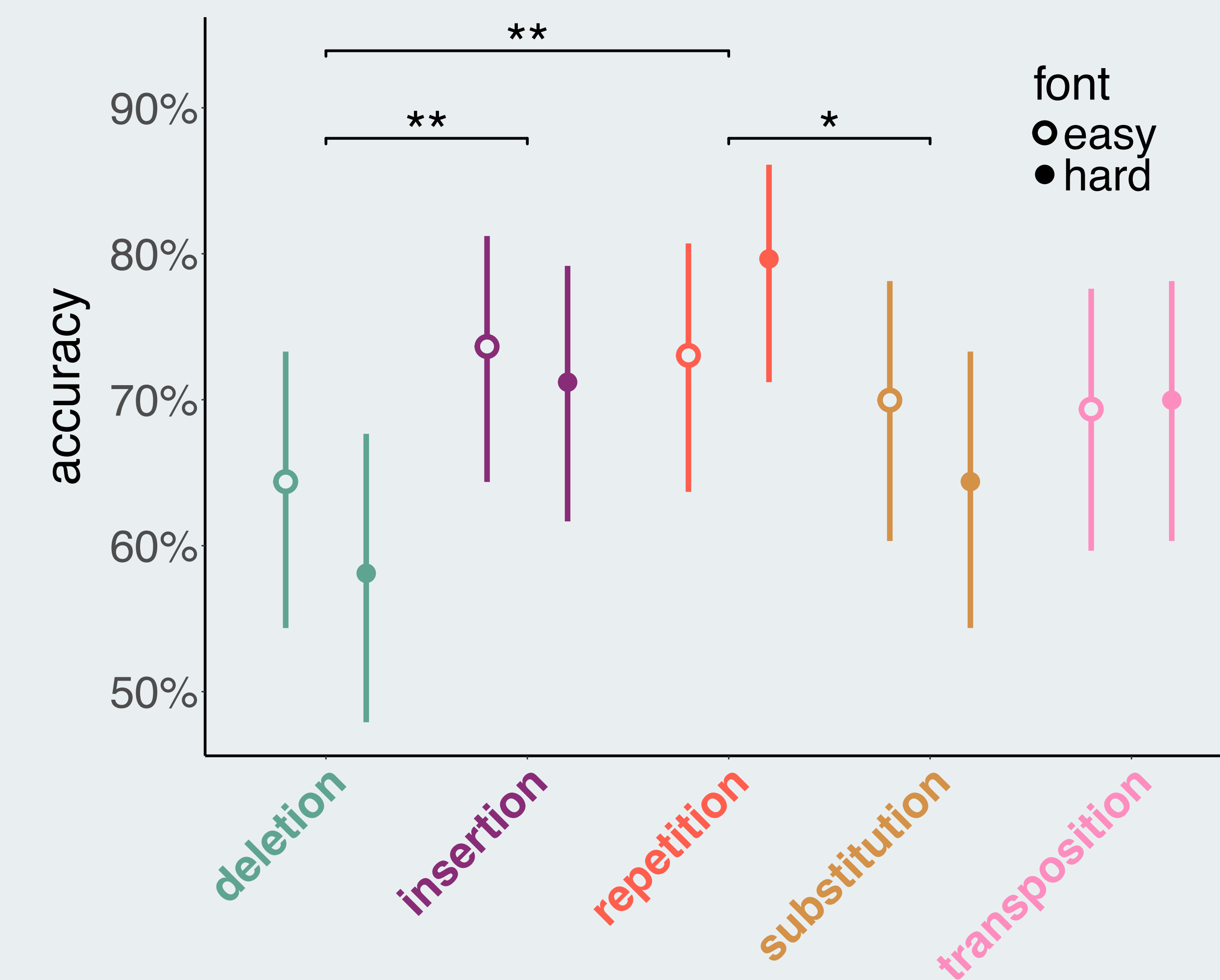This introduction has **5 typos**
Can you spot them?

How do the visual properties of text interact with attentional processes to influence visual search?

Methods

Visual search within pseudoparagraphs

Press 'f' if you see a typo and 'j' if you do not.

lasagna scold balance cricket profile smoking nothing closets camera
wildest seeds train greed failure tracks oulet walking loser
nasty laundry fever eastern resort global roots tracker caught
escaped ...
lesson stu...

1s / resp. / 1s

Correct, there was a typo.

200 trials, 50% w/ typo n=17

drain habitat assets ripple shelf entry unlucky vitals repel started upbeat founded outline narmes bleeds guarded scaring midland hatchet kidneys quilt snappy rubbish

Thin Stroke Manipulation

50% "easy" font — f — 50% "hard" font
25 — 53

drain habitat assets ripple shelf entry unlucky vitals repel started upbeat founded outline narmes bleeds guarded scaring midland hatchet kidneys quilt snappy rubbish

Types of Typos (20 of each)

deletion	insertion	repetition	substitution	transposition
(vison)	(visijon)	(visionn)	(visiqn)	(visino)

How do font and typo type impact accuracy?
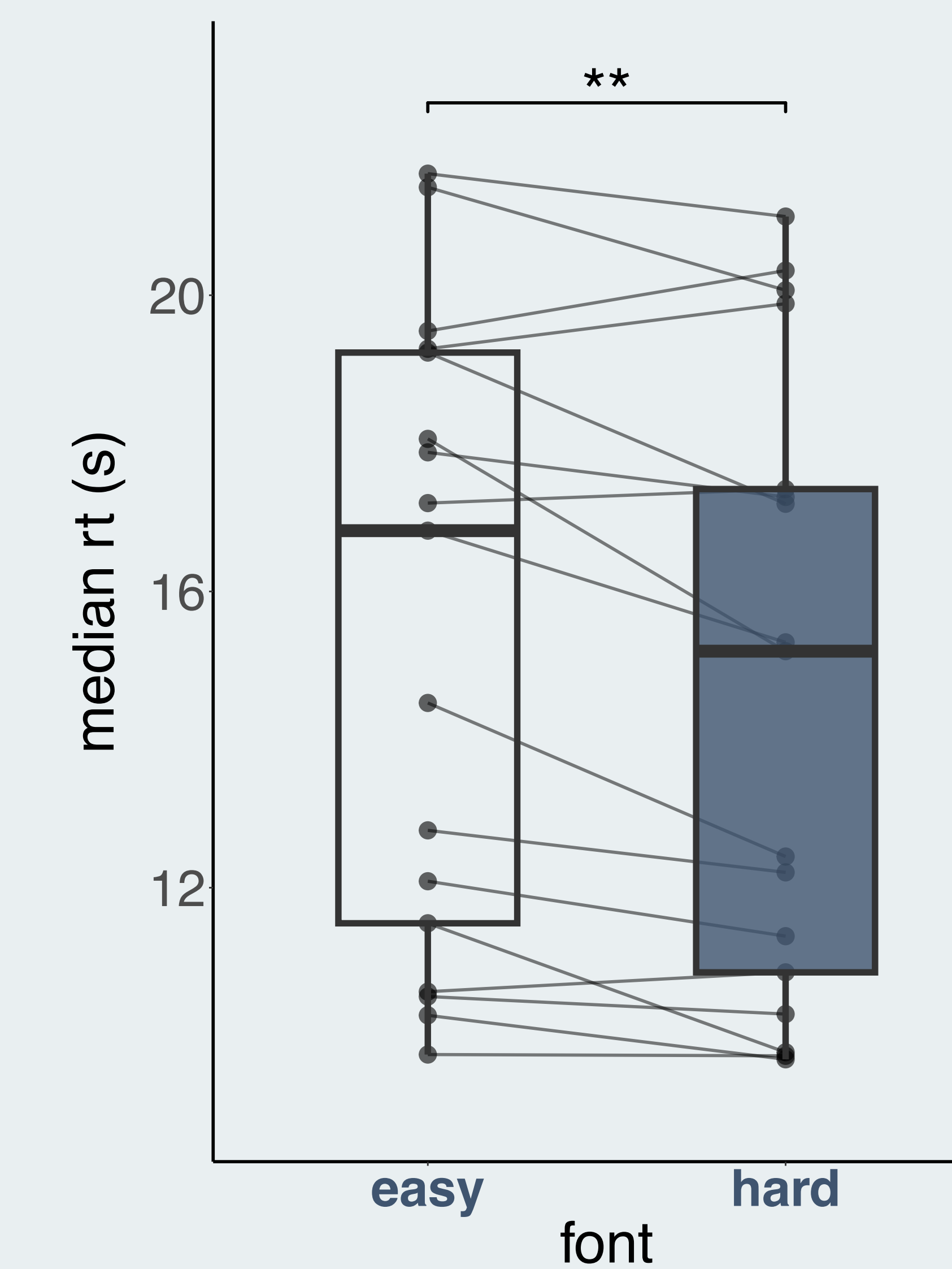

Detection is relatively **harder** for deletion and substitution.

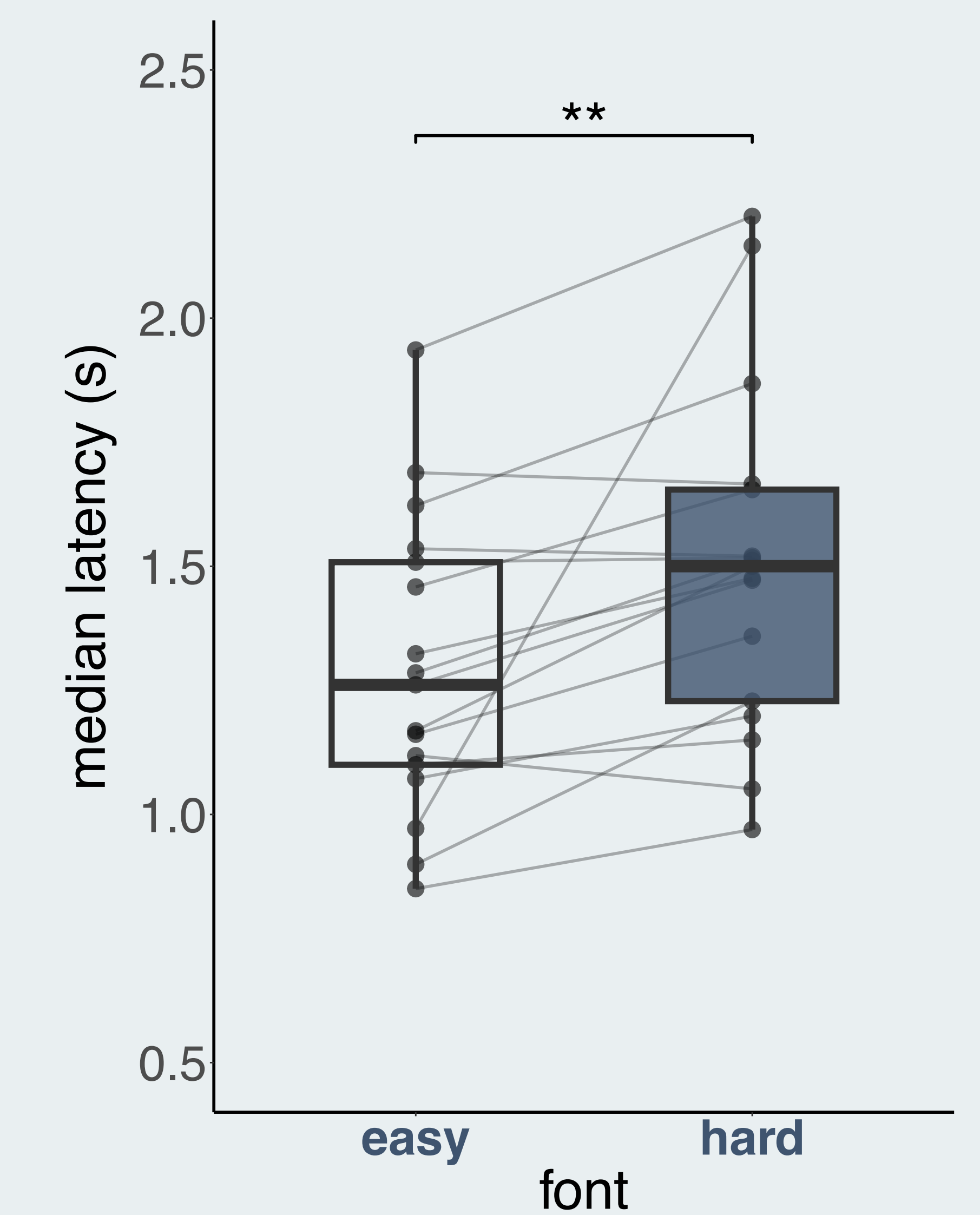Detection is relatively **easier** for insertion and repetition.

No effect of font.

When do people stop searching?

Longer search times for easy vs. hard font on typo-absent trials.
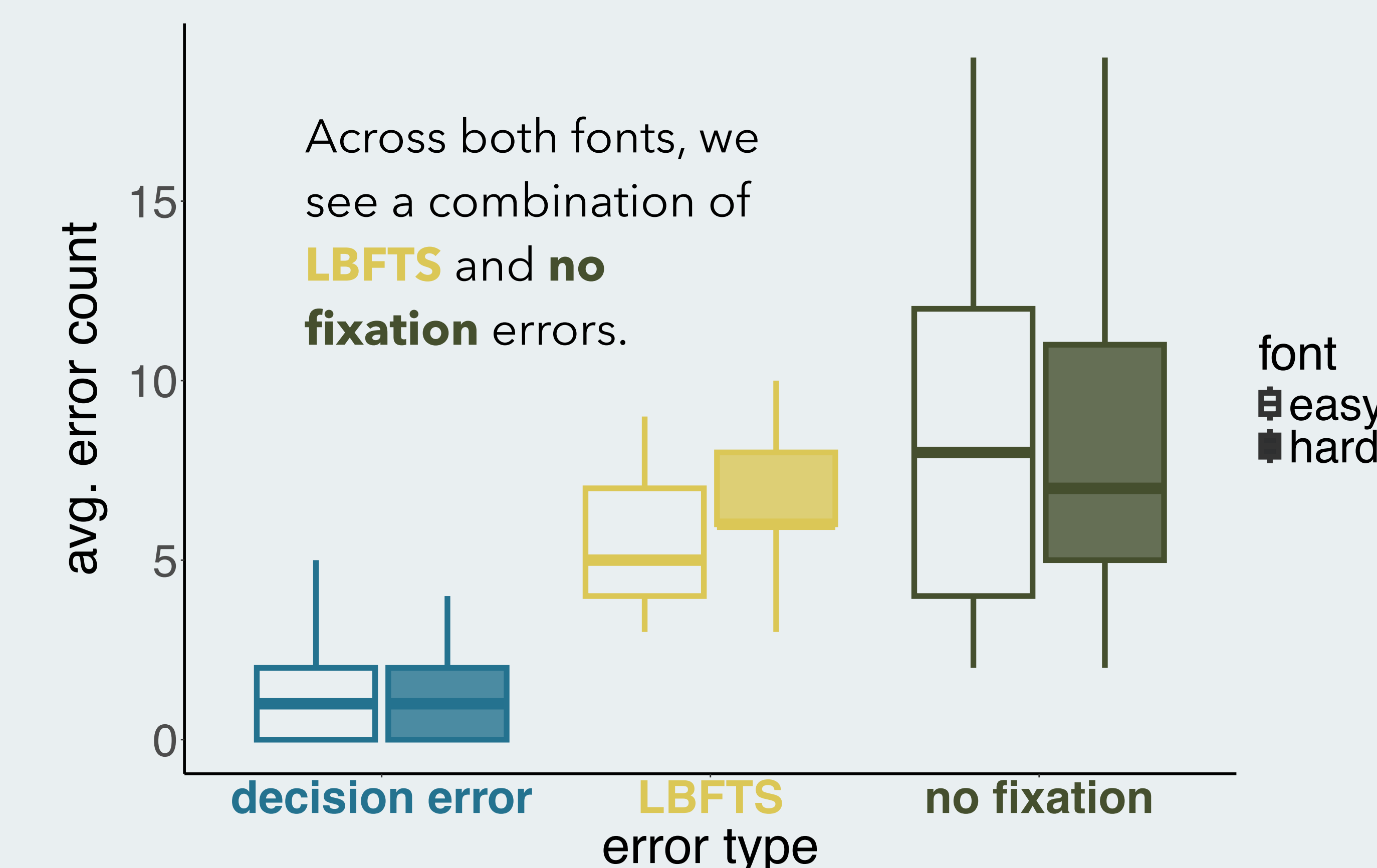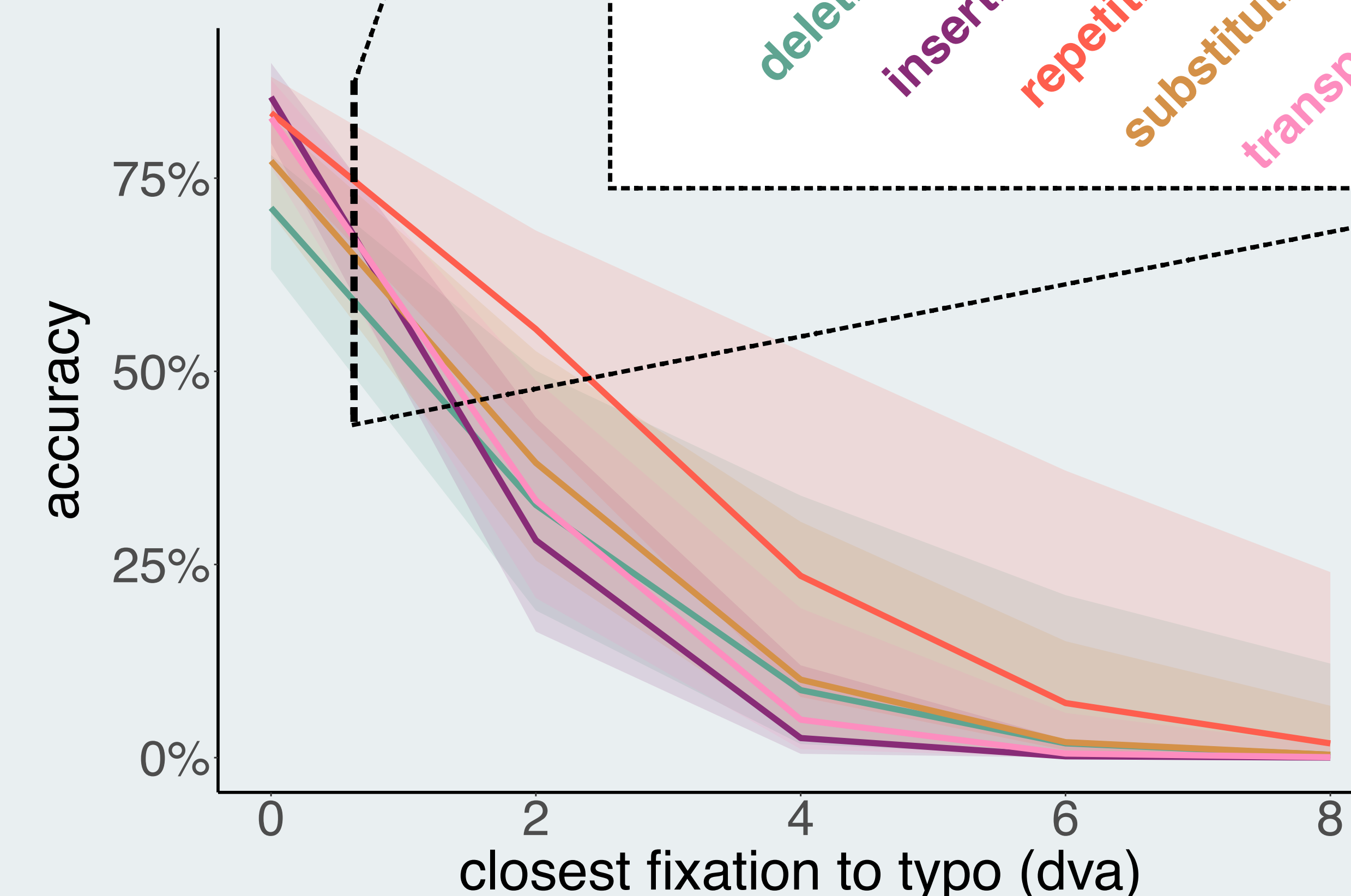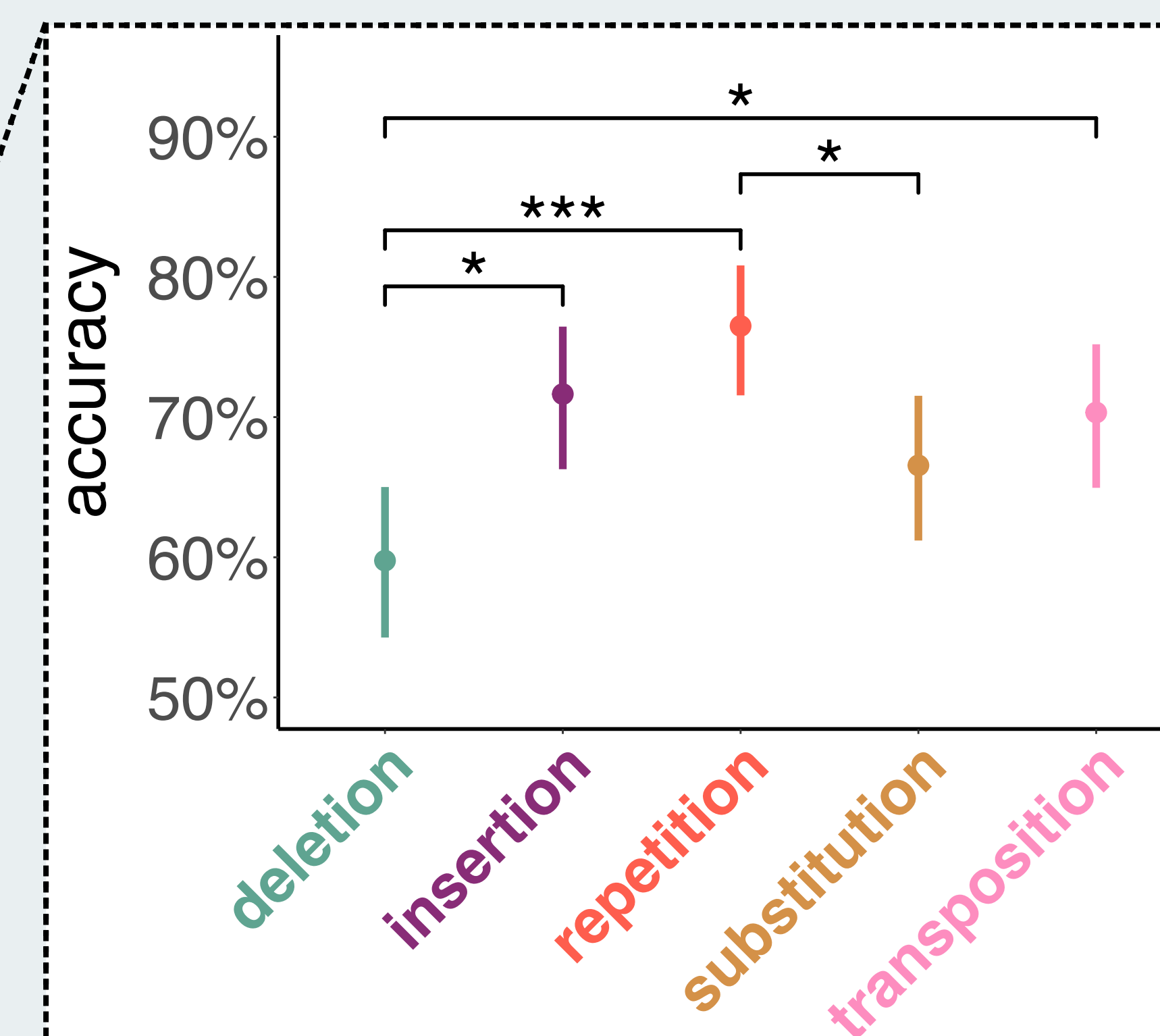
Does font impact typo processing?

After fixating on a typo, people take longer to respond for hard vs. easy font.

latency: time between **1st fixation** in **typo AOI** and response
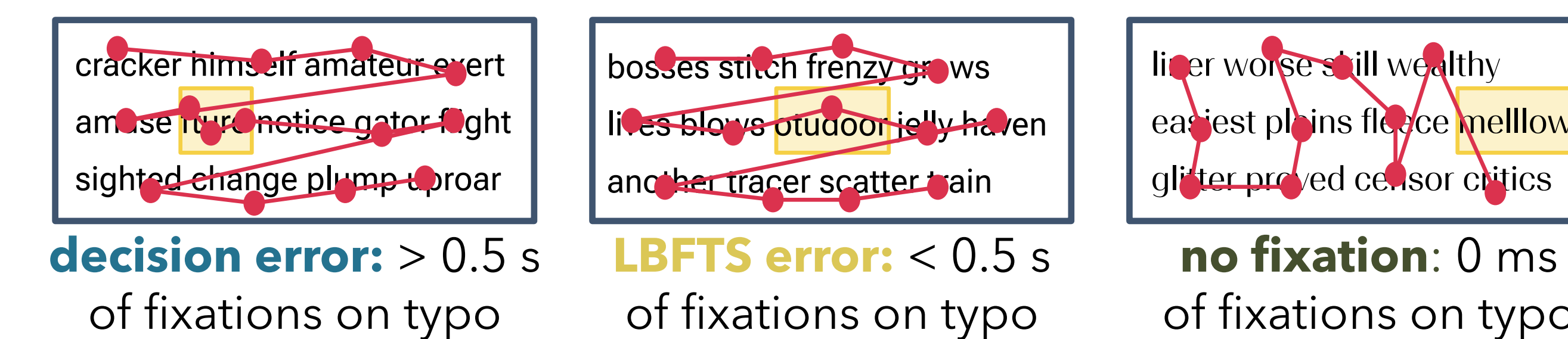
Are people looking directly at the typos they miss?

Fixating closer to a typo improves, but does not guarantee, accuracy.

Across both fonts, we see a combination of **LBFTS** and **no fixation** errors.

Error Classification[2]

decision error: > 0.5 s of fixations on typo

LBFTS error: < 0.5 s of fixations on typo

no fixation: 0 ms of fixations on typo

Conclusions

The type of typo matters: typos with added letters seem easier than those with missing/swapped letters.

Hard-to-read fonts may reduce quitting threshold but increase decision time.

Missed typos can be attributed both to LBFTS errors and failing to fixate on the typo during search.

References
[1] Wolfe, J. M., Kosovicheva, A. & Wolfe, B. Trends Cogn. Sci. 26, 809-819 (2022).
[2] Kundel, H. L., Nodine, C. F. & Carmody, D. Invest. Radiol. 13, 175-181 (1978).

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