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Breaking Focus: The impact of disruptive distractions on academic task performance

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Background

- **Educational Support and Interaction**^{1,2}: The Internet and smartphones are transforming classrooms, teaching methods, and student-teacher interactions.
 - **Effect of technology on students**^{3,4}: It could improve educational outcomes, but it has created more distractions for students.
 - **Impact of the Covid-19 Pandemic**: Increased use of technology and more study at home, resulting in even more distractions
 - **Consequences of Interruptions**^{6,7}: Involvement in unrelated activities for extended periods of time, increased frequency of errors, and a negative impact on overall performance and learning.
- Students spend only 37% of class time on academic work when using laptops⁸.

The Study

- N = 103 (M_{age} = 37 Jahre ; 45 % female)
- Participants completed two types of academic tasks: Inductive Reasoning (Text Comprehension) and Deductive Reasoning (Light Bulb) while facing distractions.
- **Text comprehension**: Participants read five syllogistic texts (3-5 premises), judged four conclusions per text, and completed a ten-question yes/no memorization task at the end of the experiment.
- **Light Bulb**: 9 devices with Boolean tasks: turn on/off three switches, test light bulb illumination, describe functionality in the input field
- **Distractions**: Participants faced 12 interruptions (6 per task), including search pop-ups (clicking on the word that appeared in the text) and party pop-ups (keeping track of the number of people and avoiding food duplication).

Research Questions:

- Do different types of interruptions (linked vs. unlinked) have varying effects on academic tasks?
- Do different types of interruptions (linked vs. unlinked) have varying effects on types of academic tasks?

Examples of the tasks

Task 1
Please read the text below carefully and answer the question at the bottom of the page.

In the infinite vastness of the universe, fascinating life forms exist on four different planets. They all have different talents and abilities and some of them joined a federation named FloraUnion long ago. One of the lifeforms are the Serapharians, of which some are in the FloraUnion federation. All Serapharians live within a binary star system. Those systems have two stars as centre, which causes various stunning cosmic events, but the most beautiful event is a regularly occurring eclipse. Maybe due to the prominence of the two stars, Serapharians are fascinated by the stars and their life-spending energy. The Serapharians live in harmony with nature and practice a deeply rooted spirituality. The most highly evolved beings in the universe, however, are on the planet Quadrian, the Quadrians. They have a strong sense of technology. Their society is characterized by innovation and scientific progress. They consider the FloraUnion federation as useless and so no Quadrians are in it.

Is it guaranteed that some Serapharians are not Quadrians?

Yes No

Device configuration

Input 1 Input 2 Input 3

Reset

Device 8

Device configuration

Input 1 Input 2 Input 3

Reset

Device 8

Examples of the distraction

Select the word that occurs in the text

In a neon green alien costume, Bob tried to parallel park but accidentally abducted a plastic flamingo instead. The pink flamingo now roams the galaxy as an interstellar celebrity.

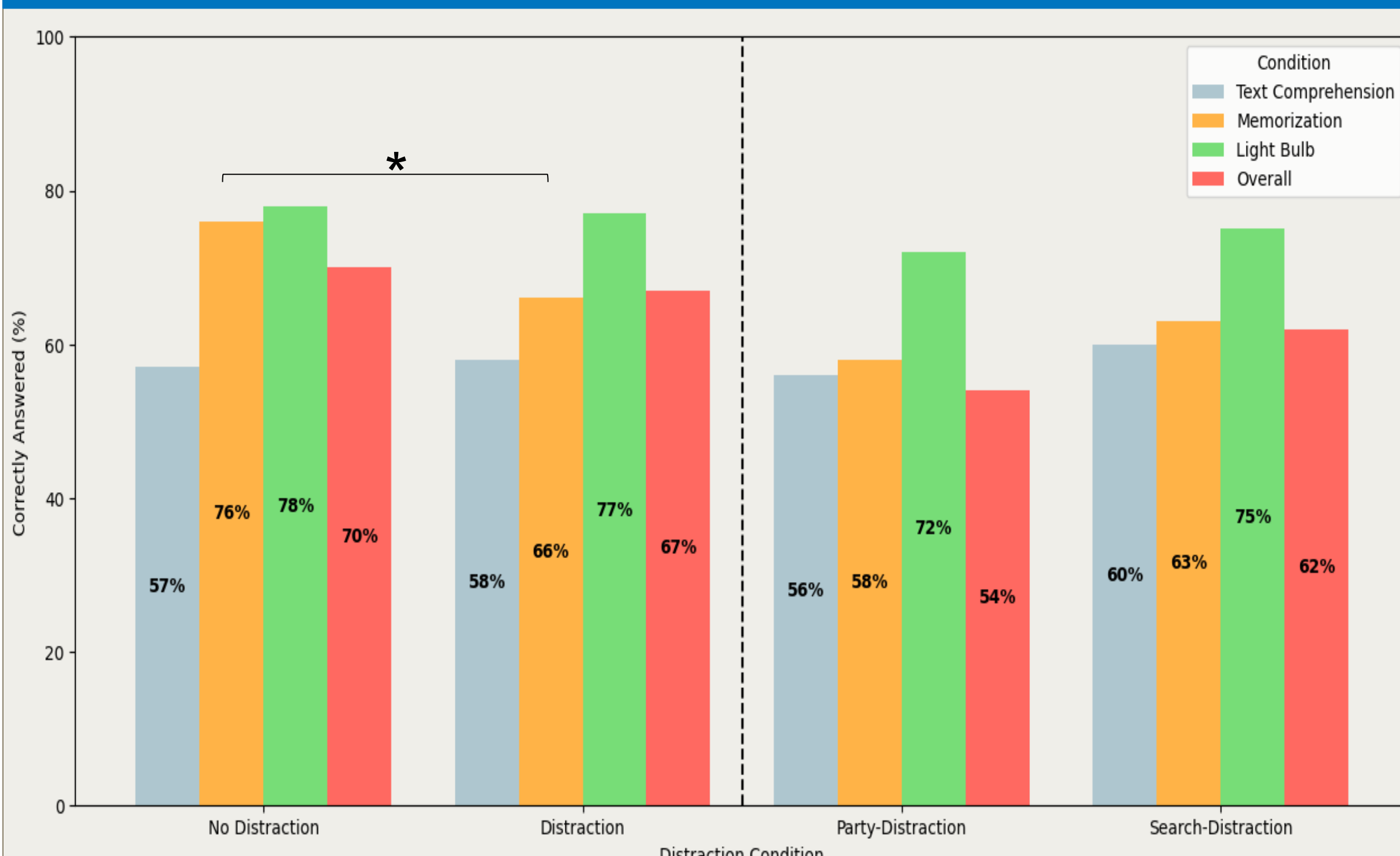
plastic red car

Leon

I would love to come! I was thinking of bringing Tim and Nina to the party with me. Is that OK?

Yes, perfect No, sorry. There are too many people

Findings



- **Correctness:**
 - Lower memory scores on trials with interruptions
 - No significant difference elsewhere
- **Type of Distraction:**
 - No difference in the type of distraction
 - Tendency to lower scores with related distractions
- **Other Findings in the Light Bulb:**
 - More tests, repetitions, and time under distraction

Summary

- The study identified learning processes that are affected by distractions:
 - Inductive learning: Distractions negatively impacted memorization.
 - Deductive learning: Distractions interfere with exploring and memorizing a system's correct and tested configurations.
 - The type of distraction seems to have an impact on performance:
 - Numerically, it shows fewer correct responses with distractors associated with all conditions.
 - The unrestricted nature of the task may have allowed for unaffected performance:
 - o No time limits
 - o Redo/Reread the task as often as they like to do
- Brief, unobtrusive distractions can significantly impair learning and working memory.

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