INTERRUPTING TETRIS: INVESTIGATING THE IMPACT OF SOUND AND VISUAL DISTRACTION

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data analysis??

Introduction

Venturing into the complex interplay of human cognition and digital interruptions, this study plunges into the immersive domain of Tetris gameplay. With 64 participants navigating the classic Tetris game under distinct interruption conditions—auditory and visual— this research untangles the threads connecting interruptions, attention, and gameplay outcomes. As the digital landscape continually evolves, the need for nuanced insights into the intricacies of user interactions becomes increasingly apparent, rendering this study a timely investigation into the effects of interruptions on gameplay performance.

results

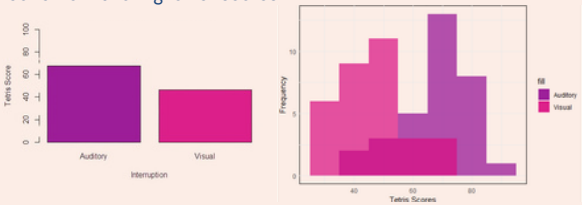
descriptive statistics: The mean Tetris score for the overall dataset was 57.28 (SD = 15.62), indicating a moderate level of gameplay performance. Participants in the auditory condition exhibited a notably higher mean score (M = 67.94, SD = 11.05) compared to those in the visual condition (M = 46.63, SD = 11.80).

	Overall	Auditory	Visual
Mean(M)	57.28	67.94	46.63
median	57	69	46
SD	15.62	11.05	11.80

The inferential analysis involved normality tests, showing non-significant deviations from normality for both auditory ($p = 0.17$) and visual ($p = 0.35$) conditions. Levene's test indicated non-significant differences in variances ($p = 0.54$).

T-test: The t-test results indicated a statistically significant difference, with participants in the auditory condition ($M = 67.94$, $SD = 11.05$) scoring significantly higher than those in the visual condition ($M = 46.63$, $SD = 11.80$), ($t = 7.46$, $df = 61.736$, $P < 0.001$). The p-value, which is less than the conventional significance level of 0.05, provides strong evidence against the null hypothesis. This means that the likelihood of obtaining such a difference in Tetris scores due to random chance is very low. The observed difference is statistically significant, supporting the conclusion that auditory interruptions have a significant effect on Tetris gameplay performance compared to visual interruptions.

Histograms further illustrated the skewness of scores, with the auditory condition favoring higher scores and the visual condition favoring lower scores.



discussion

As outlined in the results section, the mean score for the entire dataset (57.28, SD = 15.62) provides a fundamental benchmark for comprehending Tetris performance without interruptions.

Consistent with the results, our study mirrors the discoveries of Edwards et al. (2021), focusing on proactive speech agent design. It reveals a notable contrast in Tetris scores between auditory and visual interruptions. Specifically, participants experiencing auditory interruptions achieved a significantly higher mean score (67.94, SD = 11.05) compared to those with visual interruptions (46.63, SD = 11.80). This emphasizes the considerable impact of interruption modality on shaping task performance, aligning with earlier investigations by Wickens et al. (2005) and Zhao et al. (2013).

Interpretation and Implications: The performance gap observed suggests that auditory interruptions may create a more favorable cognitive environment for certain tasks. Building on the concept of auditory preemption proposed by Wickens et al. (2005), our study supports the idea that auditory stimuli might have advantages in managing interruptions compared to visual stimuli. This implies a potential cognitive advantage associated with auditory interruptions during Tetris gameplay. However, our findings also prompt consideration of modality's role in interruption performance, as discussed by Warnock et al. (2011) in the context of notification systems. The intricacies of interruption effects noted in our study may stem from the task-specific nature of Tetris gameplay, emphasizing the importance of designing interruption systems that are sensitive to the specific demands of the task at hand. While our results align with the work of Edwards et al. (2021) and Wickens et al. (2005), the study by Warnock et al. (2011) emphasizes the importance of considering modality in notification performance. This discrepancy underscores the task-dependent nature of interruption effects and highlights the need for further investigation into the interaction between interruption modality and specific cognitive tasks.

Conclusion

In conclusion, our study sheds light on the impact of interruption modality on Tetris performance. Acknowledging the limitations, particularly the controlled gameplay environment and the oversight of individual differences, future research should explore shared input multimodal interfaces, investigate temporal aspects of interruptions, and examine individual differences for more personalized interruption management strategies. This approach aligns with the dynamic nature of human-computer interaction and underscores the importance of nuanced interruption system design.

limitations & future work

In exploring the impact of interruption modality on Tetris performance, our study unveils valuable insights, yet certain limitations warrant consideration. The controlled Tetris gameplay environment, as identified by Wickens et al. (2005), may limit the generalizability of our findings to diverse cognitive tasks and real-world scenarios. Additionally, our study overlooks individual differences in cognitive abilities and preferences, as emphasized by Warnock et al. (2011). To address these gaps, future research could draw inspiration from Zhao et al. (2013) and delve into shared input multimodal interfaces in complex, real-world contexts, providing a more comprehensive understanding of how interruption modality influences performance beyond Tetris. Considering Edwards et al. (2021), a deeper examination of the temporal aspects of interruptions could enhance our understanding of their dynamic effects over time, contributing to a more nuanced comprehension of interruption management. Furthermore, inspired by Wickens et al. (2005), future work could explore individual differences to develop personalized interruption management strategies. This would align with the call for context-aware design, as highlighted by Warnock et al. (2011).

references

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