

The Impact of Auditory Smartphone Notifications on Typing Performance and Cognitive Load in Adolescents

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An experimental study on typing speed and accuracy under digital interruptions

Research Question

- To what extent do auditory smartphone notifications affect typing performance and cognitive load in adolescents?

Purpose

- To examine how auditory notification sounds influence typing speed and accuracy during sustained attention tasks

Hypothesis

- Auditory smartphone notifications will significantly reduce typing speed and accuracy by increasing cognitive load and disrupting attentional control
- These effects are expected to result from attentional capture and increased mental processing demands during task performance

Methodology

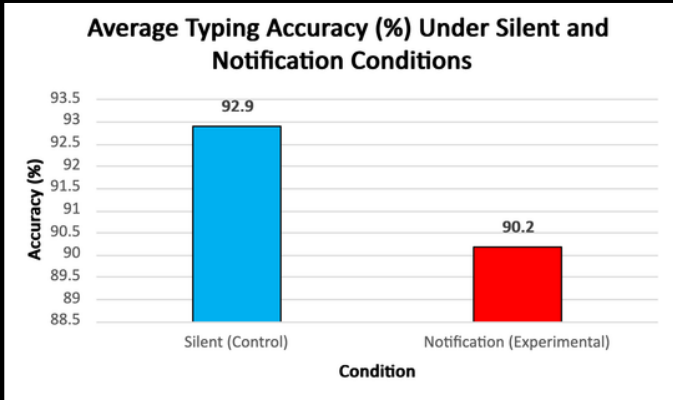
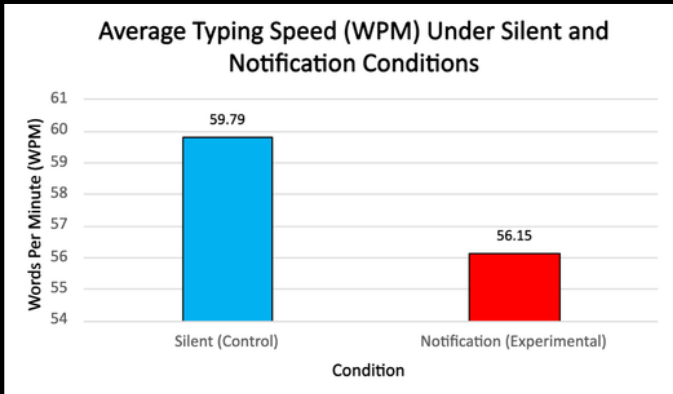
- 34 adolescents (ages 14–17) participated in a counterbalanced within-subjects experimental design to control for order and practice effects
- Each participant completed two timed typing trials (3 min 45 sec) under silent (control) and notification conditions, with three standardized auditory alerts presented at fixed intervals
- Typing performance was measured using a standardized platform (Monkeytype), recording speed (WPM), and accuracy (%) under controlled and consistent testing conditions
- Data were analyzed using a paired-samples t-test to determine statistical significance, with effect size calculated using Cohen’s d to assess practical impact

Data Analysis & Results

- Typing speed decreased from 59.79 WPM (silent) to 56.15 WPM (notification), a 6.1% reduction
- Typing accuracy decreased from 92.9% to 90.2%, a 2.7% reduction
- A paired-samples t-test showed a statistically significant difference between conditions ($t(33) = 5.51, p < .001$)
- Effect size analysis indicated a large effect (Cohen’s $d = 0.95$), suggesting a meaningful impact on performance

Data captured and graphed by Beren Uluc, using Microsoft Excel.

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Interpretation & Conclusions

- Smartphone notification sounds significantly impaired typing performance, reducing both speed (6.1%) and accuracy (2.7%), supporting the hypothesis
- Despite small individual changes, the consistent downward trend across participants produced a statistically significant result ($t(33) = 5.51, p < .001$) with a large effect size ($d = 0.95$)
- Findings are consistent with attentional capture, where sudden auditory stimuli divert attention, disrupting top-down cognitive control and increasing cognitive load
- These results suggest that even brief digital interruptions can impair sustained attention during academic tasks; minimizing notifications (e.g., “Do Not Disturb”) may improve focus and productivity