

Literature Review: Does Dark Mode vs. Light Mode Affect User Focus During Short Tasks in Productivity Apps?

1) Introduction

Productivity apps often support two visual themes—light mode (dark text on light background) and dark mode (light text on dark background). For short, glanceable tasks (e.g., scanning lists, triaging inbox items, copying numbers), “focus” typically shows up as speed and accuracy with low mental effort. Classic vision research points to a “positive polarity advantage,” where light mode improves legibility and proofreading, especially for small text. More recent HCI work complicates the picture: dark mode can reduce perceived workload and eye fatigue in some contexts, but objective performance effects vary with task and ambient light. This review synthesizes results to clarify which mode best supports focus during short tasks. [Heinrich Heine University+2Europe PMC+2](#)

2) Proxy Paper

Ettling et al. (ETRA '25) ran an eye-tracking study on dashboard decision tasks (a close analog to short productivity tasks). Dark mode yielded **lower perceived workload (NASA-TLX)** across complexities, and **higher accuracy** at medium complexity, while **task time differences were non-significant**. Pupil dilation was higher in dark mode, yet users reported lower workload—hinting that subjective comfort and objective arousal can diverge. I’ll use their measures (speed, accuracy, TLX, eye metrics) as a methodological template. [alexandria.unisg.ch](#)

How my study will differ/extend: (a) focus explicitly on **short tasks** typical of productivity apps (e.g., quick selection, error spotting, copy-paste), (b) control **ambient illumination** typical of offices, and (c) stratify by **age** and **display type** to probe moderating effects suggested by prior work. [alexandria.unisg.ch](#)

3) Thematic Summary

Theme A: Reading/Glance Performance (speed & accuracy)

A long line of lab studies shows **light mode** advantages for reading speed/accuracy and fine-detail perception—the “positive polarity advantage”—with mechanisms linked to **smaller pupils on brighter displays**, improving retinal image sharpness. Effects strengthen with **smaller text** and persist across age groups. In HCI-relevant reading tasks (including glance reading), CHI’23 work also found **light mode reliably faster** than dark. Together, this suggests that when short tasks hinge on quick text parsing, **light mode tends to support focus** (operationalized as fast/accurate throughput). [thereadabilityconsortium.org+3Heinrich Heine University+3psychologie.hhu.de+3](#)

Representative findings

- Positive polarity advantage due to luminance, not just familiarity. [Heinrich Heine University](#)
- Advantage grows as character size decreases (small, dense UI). [Europe PMC](#)
- CHI'23: Light mode faster for both glance and paragraph reading. [thereadabilityconsortium.org](#)

Theme B: Visual Comfort & Cognitive Load (eye strain, workload)

Several newer studies report **dark mode can reduce eye fatigue** or **subjective workload** in certain conditions—even when **objective speed/accuracy don't improve**. For example, on smartphones dark mode reduced **self-reported eye fatigue** under bright ambient light; on tablets, short-term physiology and symptoms differed modestly between modes; in dashboards, dark mode reduced **perceived workload** without a clear speed advantage. Age and lighting moderate effects: **older adults** and **bright environments** often show higher cognitive load with negative polarity; younger adults sometimes tolerate dark mode better in dim light. [Europe PMC+3thinkmind.org+3MDPI+3](#)

Representative findings

- Dark mode lowered **eye-fatigue** in bright light (smartphone). [thinkmind.org](#)
- Tablet study (1 h use): mode differences were small; some measures favored dark mode for comfort; overall fatigue rose over time in **both** modes. [MDPI](#)
- Cognitive load varies with **age** and **illumination**; negative polarity can increase load for some groups. [Europe PMC](#)
- In dashboard decision tasks, **lower TLX** in dark mode; **time similar**. [alexandria.unisg.ch](#)

4) Synthesis & Answer to the Question

For **short productivity tasks** where focus = **fast, accurate micro-reads**, the weight of evidence favors **light mode** due to well-replicated **positive polarity** benefits on legibility and glance performance. However, **dark mode** can **feel** easier (lower workload) and **reduce eye fatigue** in some settings—especially **bright ambient light** or prolonged sessions—without necessarily speeding task completion. In practice:

- If your short tasks are **text-heavy and time-sensitive**, default to **light mode**. [Heinrich Heine University+1](#)
- If users report **visual discomfort** (or work in **bright** conditions), **dark mode** may **improve comfort** even if speed/accuracy don't change. [thinkmind.org+1](#)
- Expect **individual differences** (age, vision, preferences) and **task-type/lighting** interactions. [Europe PMC](#)

5) Research Gap & Proposed Focus

We still lack **controlled, app-context studies** on **very short, productivity-specific tasks** (e.g., inbox triage, code-copy, quick sort/filter) comparing modes under **typical office lighting** and **modern displays (OLED/LCD)**. I would extend Ettling et al. by:

- Tasks: 10–30 s trials for scanning, copy-verify, error-spotting.
- Measures: **Time, accuracy**, NASA-TLX; **pupillometry** for arousal; brief **visual-fatigue** checklist.
- Factors: Mode (light/dark), **ambient light** (dim/office/bright), **age group** (18–35 vs 50+), **display type**.

This directly targets whether **mode meaningfully shifts short-task focus** beyond comfort. alexandria.unisg.ch

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