Media Multitasking and Cognitive Flexibility: An Investigation of a Non-linear Correlation

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Abstract

Research on media multitasking is troubled by ambiguous results, often comparing extreme groups of media multitasking behavior. This study investigated a potential non-linear correlation by using all data from the short media multitasking measure and the Modified Card Sorting Test to gain a comprehensive understanding of the relationship. Anticipating an inverse U-shaped correlation, the study employed a novel approach by using polynomial regression. A total of 161 participants were tested online via survey exchange sites. By comprehensively exploring the impact of media multitasking on cognitive flexibility, this study aimed to address various conflicting aspects of the current literature. However, no significant relationships were found, and underlying limitations were discussed to guide future research in this area.

Keywords: media-multitasking, cognitive flexibility, polynomial regression, MMM-S, Modified Card Sorting Test

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With the increased use of media technology and media multitasking (MM), there is a growing interest in the influence on our cognitions and behaviors (Carrier et al., 2009). One of the first studies that researched MM as a trait was conducted by Ophir and colleagues (2009). In their paper, MM was defined as the simultaneous consumption of different streams of content through different forms of media. The present work examines media multitasking as defined by the Media Multitasking Index, a questionnaire devised by Ophir and colleagues in the course of their work. This questionnaire categorizes individuals into Heavy (HMM), Light (LMM), and Intermediate Media Multitasking Users (IMM) based on standard deviations from the mean of the current sample, an approach that has been maintained to this day Further explanations of the MMI will be provided in the methods section. A review of the effects of media multitasking on youth by Van der Schuur and colleagues (2015) found that MM was primarily investigated regarding three different aspects: cognitive control abilities, academic performance, and socioemotional function. In their review, the authors formulated two opposing hypotheses regarding the effects of MM on cognitive control: the scattered attention hypothesis and the trained attention hypothesis. The arguments supporting each one can be traced back to the discussion presented by Ophir and colleagues (2009). According to the scattered attention hypothesis, regular media multitasking leads to not only a "breadth-bias" toward media consumption but also a breadth-bias in cognitive control, which makes them susceptible to distractors. Conversely, the trained attention hypothesis argues that the ability to switch between tasks and focus on relevant stimuli can be developed through training. Since then, there has been evidence for either the scattered attention hypotheses (Kong et al., 2009; Ophir et al., 2009; Uncapher & Wagner, 2018; Van Der Schuur et al., 2015; Yap & Lim, 2013) or the trained attention hypothesis (Alzahabi & Becker, 2013; Ophir et al., 2009; Van Der Schuur et al., 2015). However, not all studies have found significant relationships; for instance,

Edwards and Shin (2017) and Seddon et al. (2018) reported no significant effects of media multitasking on cognitive control.

Methods

We report how we determined our sample size, all data exclusions (if any), all manipulations, and all measures in the study.

Participants

Material

Procedure

Data analysis

We used R (Version 4.4.1; R Core Team, 2024) and the R-packages *papaja* (Version 0.1.2.9000; Aust & Barth, 2023), and *tinylabels* (Version 0.2.4; Barth, 2023) for all our analyses.

Results

Discussion

References

Aust, F., & Barth, M. (2023). *papaja: Prepare reproducible APA journal articles with R Markdown* [Manual].

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