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Does the Relationship Between Media Multitasking and Task-Unrelated Thoughts During University Lectures Vary as a Function of Device Usage Restriction?

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Abstract: The present study aimed to examine whether the relationship between media multitasking and task-unrelated thoughts experienced during live lectures across various universities differs depending on the extent to which media device usage was restricted by instructors during the lecture. A total of 250 undergraduate students were asked to complete questionnaires regarding the degree to which they had engaged in media multitasking and experienced task-unrelated thoughts during their most recent lecture, as well as the extent to which media device usage had been restricted in that class. Correlational analyses revealed that the association between lecture-unrelated media multitasking and task-unrelated thoughts was weaker when the level of device usage restriction was high compared to when it was low. In contrast, no significant difference was found in the relationship between lecture-related media multitasking and task-unrelated thoughts depending on the level of device usage restriction. These findings are discussed in light of how various types of attentional disengagements experienced by contemporary university students during live lectures may be influenced by classroom policies regarding media device usage.

Keywords: Media multitasking, task unrelated thoughts, mind wandering, classroom, university lectures

1. Introduction

Maintaining attention to lecture content is critical for effective learning. However, attentional disengagement often occurs during university lectures, diverting attention to other stimuli. At least two distinct forms of disengagement have been identified (Wammes et al., 2019). One is media multitasking (MMT), where students listen to lectures while simultaneously using media devices such as PCs or smartphones. The other is task-unrelated thoughts (TUTs), in which students' attention drifts from the lecture content toward unrelated thoughts (e.g., Kane et al., 2017; Wammes et al., 2019). Both forms of disengagement have been suggested to affect learning outcomes (e.g., Szpunar et al, 2013), highlighting the need to understand their mechanisms and identify potential strategies for control.

Recent studies have suggested the relationship between TUTs and MMT (e.g., Kane et al., 2017; Kane et al., 2021; Morita, 2025; Wammes et al., 2019). For instance, Morita (2025) conducted a survey across multiple universities and reported a significant positive correlation between TUTs and lecture-unrelated MMT, but no significant correlation between TUTs and lecture-related MMT. The findings suggest that TUTs may serve as a precursor to unrelated MMT. However, this study did not examine whether media device usage was restricted during the lectures, leaving its influence on the TUT-MMT relationship unclear. It is plausible that when device usage is restricted, the opportunity to engage in MMT is limited, weakening the TUT-MMT link. Yet empirical evidence addressing this possibility is scarce. Therefore, the present study aims to investigate whether the relationship between TUTs and MMT varies

depending on the extent of device usage restriction during lectures, by simultaneously measuring these variables across multiple university settings.

2. Method

2.1 Participants

A total of 250 undergraduate students (*M* = 20.23 years, *SD* = 1.63, range = 18–24) from various four-year universities in Japan participated in the study. They majored in various fields across the humanities, social sciences, natural sciences, engineering, and health sciences. All participants were registered members of an online survey panel.

2.2 Measures and Procedure

TUTs during lectures were assessed using a modified version of the questionnaire by Soemer et al. (2024), adapted for this study to measure TUTs during class. The scale included three items assessing how much participants experienced TUTs during both the first and second halves of a lecture attended within the past week. A sample item was “I often thought about something unrelated to the course material.” Responses were given on a 4-point scale (1 = not at all true, 4 = completely true). MMT was assessed using items adapted from Kane et al. (2021). The adaptation aimed to distinguish between lecture-related and lecture-unrelated MMT in the measurement of media multitasking during class. Each subscale included three items assessing how often participants checked or sent emails, browsed websites, or sent instant messages that were either related or unrelated to the lecture content during the first and second halves of the lecture. Responses were given on a 5-point scale (1 = never, 5 = very frequently). Device Usage Restriction was measured using two items asking about restrictions on smartphone and computer use during the lecture. A sample item was “The use of smartphones was restricted during the class. ” Responses were recorded on a 7-point scale (1 = not at all true, 7 = completely true).

Participants were first asked whether they had attended a university lecture in the past week. Those who answered affirmatively were then asked how many days ago the most recent lecture occurred. Subsequently, they were instructed to complete questionnaires mentioned above. Prior to conducting the study, the research protocol was reviewed and approved by the ethics committee of the author's university.

3. Results

Of the 250 participants, 34 were excluded: 33 had not attended a class within the past week, and 1 failed to understand the instructions. The remaining 216 participants were included in the analyses.

The mean rating of TUTs was *M* = 2.53 in the first half of the lecture and *M* = 2.46 in the second half. The mean rating of lecture-unrelated MMT was *M* = 2.06 in the first half and *M* = 2.03 in the second half, while the mean rating of lecture-related MMT was *M* = 1.88 in the first half and *M* = 1.83 in the second half. Paired-sample *t*-tests indicated no significant differences between lecture halves for any variable.

Table 1 shows correlation coefficients. In the first half, significant positive correlations between TUTs and unrelated MMT were observed in both groups. In the second half, this correlation remained significant only in the low restriction group. Fisher's *r*-to-*z* tests showed that correlations between TUTs and unrelated MMT were significantly weaker in the high restriction group for both halves (Z = -2.38, p = .017; Z = -3.94, p < .001). No significant correlations were found between TUTs and lecture-related MMT in either group or lecture half (*r*s = .001 to .153, *p*s > .090), and no group differences were observed (Z = -1.10, p = .270; Z = -0.80, p = .422).

Table 1. *Differences in Correlations Between TUTs and MMTs Across Groups with Low and High Levels of Device Usage Restrictions*

	Low Restriction		High Restriction		Difference	
	r	*p*	*r*	*p*	*Z*	*p*
First Half of Lecture						
Lecture-Unrelated MMT	0.499	<.001	0.214	.040	-2.38	.017
Lecture-Related MMT	0.153	.090	0.001	.990	-1.10	.270
Second Half of Lecture						
Lecture-Unrelated MMT	0.602	<.001	0.148	.150	-3.94	<.001
Lecture-Related MMT	0.121	.190	0.010	.920	-0.80	.422

Note. Z statistics are based on Fisher's *r*-to-*z* transformation.

4. Discussion

The study aimed to investigate whether the relationship between media multitasking and task-unrelated thoughts during university lectures varies with device usage restriction. Data from 216 students showed no difference in TUTs or MMT between lecture halves. Significant positive correlations between TUTs and unrelated MMT were observed, aligning with prior research (Morita, 2025). Students may use devices to follow up on off-topic thoughts during lectures. This correlation was weaker in the high restriction group, suggesting that restrictions may hinder the process by which TUTs lead to unrelated MMT.

5. Conclusions

This study examined whether the relationship between TUTs and MMT varies according to the level of device usage restriction during university lectures. Results suggest that higher levels of device usage restriction may weaken the link between TUTs and unrelated MMT. Future research should examine in more detail how changes in device usage restriction (e.g., restricting all device usage vs. restricting only lecture-unrelated device usage) affect TUTs, MMT, and the relationship between them, in order to make computer use in the classroom more effective and fruitful.

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