**Research Traineeships 2021 proposal format**


**1. Title of the project**

Media-multitasking and decision making


**2. Coordinators**

Elger Abrahamse (Department of Communication and Cognition)

Drew Hendrickson (Department of Cognitive Science and AI)

Emiel Krahmer (Department of Communication and Cognition)


**3. Project summary**

Media-multitasking (MM) refers to the simultaneous consumption of multiple media streams (Uncapher & Wagner, 2018). With recent increases in access to and use of new media, MM is increasing as well. Media psychology aims to understand media selection: When and why do people choose certain media behaviors over others? What (cognitive) profile distinguishes light (LMM) from heavy (HMM) media-multitaskers?

Previous work suggest HMMs have a more reactive decision making style than LMMs: HMMs have increased self-reported mind-wandering and everyday lapses of attention (Ralph et al., 2014); less goal-related attentional selectivity (Ophir et al., 2009); greater self-reported impulsivity (Minear et al., 2013); reduced self-reported self-control (Minear et al., 2013); increased reliance on automatic processing (Schutten et al., 2017); and a reduced ability to delay gratification (Schutten et al., 2017).

From Daw's theory of behavioral control (2005), these findings suggest that HMMs and LMMs differ in the neural control system driving behavior. Specifically, HMMs may rely more on the model-free system, which is likely to result in impulsive choices, instant gratification, and failure to consider long-term goals (Kurth-Nelson et al., 2012). Little to no studies have explicitly connected Daw's theory to MM, even as it may provide a cognitive account to explain problematic media-multitasking behavior. Importantly, it would connect MM to cognitive functions more broadly modeled by Daw's model (e.g. Wood & Neal, 2007; Daw et al, 2011).

The current study tests the association between MM and model-free control, embedding MM behavior in a formal model that is computationally and biologically well-grounded.

Research questions: Does behavioral control explain variability in self-reported measures of media-multitasking? If so, can it be predicted by other demographic measures?

Method of data gathering: 2-day lab-experiment (~1h per day). Participants perform standardized decision making tasks on Day 1, and fill out questionnaires (including MM measures) on Day 2.

Collaboration: The study naturally arises from a shared interest in new media use and its interplay with human cognition. Abrahamse and Krahmer provide the experimental approach and theoretical framing, while Hendrickson provides expertise in experimental measures of decision making and estimating computational models based on data. This study will form the basis for a longer-term

collaboration between the departments, aiming to secure external funding to expand the program of connecting computational models of decision making to measures of media-multitasking.

Objectives: Open source data set, manuscript, conference presentation.

## 4. Project timeline

Project timeline:

| WHEN | WHAT | WHO |
|---|---|---|
| *September-October 2021* | Select and create materials based on a literature study | Abrahamse (lead), Hendrickson (assist), Krahmer (assist), trainee (assist) |
| *October 2021* | Apply for ethical approval; book the lab; set up a SONA system for recruitment of students as participants | Trainee + Abrahamse (lead), Krahmer (assist), Hendrickson (assist) |
| *November-December 2021* | Collect data | Trainee (lead), Abrahamse (assist) |
| *January-February 2021* | Analyze data | Trainee (lead), Hendrickson (supervise), Abrahamse (assist) |
| *March-June 2021* | Prepare manuscript | Abrahamse (lead), Hendrickson (supervise), Krahmer (supervise), Trainee (assist) |
| *July 2021* | Submit manuscript to a journal | Coordinators, trainee |

## 5. Research trainee profile

We are looking for an enthusiastic student (Ba, Ma, or ReMa level) who:

- is interested in cognitive phenomena related to new media use

- has experience with programming (preferably python or r; experience with machine learning and/or computational modeling is a plus)

- is able to work in an organized manner during data collection

- wants to become acquainted with lab techniques necessary to collect behavioral data and apply computational models to new data.

The trainee will be involved in a literature study, the design of the experiment, the creation of the materials, data collection, and data processing. The main responsibility from these will be data collection. As a co-author of the manuscript that will be prepared based on the study, the trainee will assist in the writing process as well. This will all provide the trainee with a set of core research skills.