



# Daily Demands Interfere with Cognition: Some Days are Better than Others

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## Background

- Cognitive interference, either internal (e.g., rumination) or external (e.g., distraction), can reduce ability to inhibit irrelevant information and can disrupt cognitive functioning processes (Clapp & Gazzaley, 2010)
- Previous research mainly conducted in lab-based settings and examining between-person differences rather than within-person fluctuations in everyday life
- Within-person research found cognitive interference negatively correlated with lab-based cognitive performance (Stawski, Sliwnski, & Smyth, 2006; Stawski, Sliwnski, & Smyth, 2010) among older adults, although not known whether negative effects of cognitive interference occur earlier in adulthood
- We investigated the role of internal sources of interference (i.e., intrusive thinking and multitasking) in everyday life in relation to daily cognition (self-reports and cognitive performance), and the moderating role of age across the adult lifespan

## Current Study

### Research Questions and Predictions

- Do internal sources of interference (intrusive thinking and multitasking) affect cognition in daily life? *We hypothesized that greater cognitive interference would be associated with worse daily cognition.*
- Is age a moderator of the relationship between cognitive interference and daily cognition? *We predicted that cognitive interference would have a more detrimental effect for older adults compared to younger adults.*

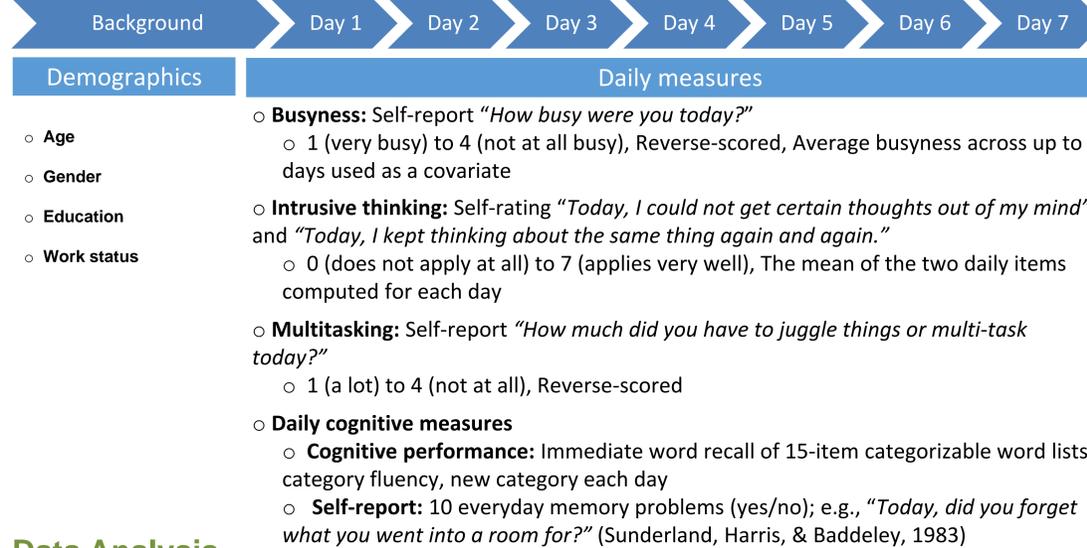
## Methods

### Daily Experiences and Memory Study

#### Participants

N = 122  
Age ( $M=50.5$ ,  $SD=20.0$ ), education ( $M=15.5$  years,  $SD=2.4$ ), 57% female, 50% working

## Methods: Procedure and Measures



### Data Analysis

- Multi-level modelling (MLM) using SAS Version 9.2
- Covariates: diary day, age, gender, education, working status, average busyness
- Within-person relationship between daily cognitive interference (intrusive thinking and multitasking) and daily cognition
- Age as a moderator of the within-person relationship between cognitive interference and daily cognition

$$\text{Daily cognition}_{ij} = \gamma_{00} + \gamma_{01}(\text{Covariates}_i) + \gamma_{02}(\text{Cognitive interference}_{ij}) + \gamma_{03}(\text{Age}_{ij}) + \gamma_{04}(\text{Cognitive interference} * \text{Age}_{ij}) + u_{0j} + u_{1j} + r_{ij}$$

## Results

Table 1  
Results of multilevel model of **intrusive thinking** as a predictor of daily cognition

Parameter	Dependent variables, Est. (SE)		
	Category fluency	Immediate word recall	Everyday memory problems
Intercept	5.76 (2.62)*	6.92 (1.09)*	2.21 (1.08)*
Intrusive thinking (within-person)	-0.36 (0.14)*	0.02 (0.05)	0.08 (0.03)*
Intrusive thinking (person-mean)	0.00 (0.22)	0.16 (0.08)	0.37 (0.09)*

Note. Model adjusted for day, age, gender, education, working status, and busyness

Table 2  
Results of multilevel model of **multitasking** as a predictor of daily cognition

Parameter	Dependent variables, Est. (SE)		
	Category fluency	Immediate word recall	Everyday memory problems
Intercept	5.94 (2.42)*	7.67 (1.02)*	3.89 (1.07)*
Multi-tasking (within-person)	-0.04 (0.23)	0.05 (0.08)	0.18 (0.06)*
Multi-tasking (person-mean)	-1.15 (0.60)	-0.40 (0.25)	0.13 (0.27)

Note. Model adjusted for day, age, gender, education, working status, and busyness

## Results

### Research question 1: Cognitive interference and cognition

- As expected, on days with more intrusive thoughts participants scored worse on category fluency (Figure 1); however, multi-tasking was not related to category fluency
- Contrary to our expectations, cognitive interference was not related to memory recall
- As expected, on days with more intrusive thinking (Figure 2) and multi-tasking (Figure 3), participants reported more everyday memory problems

Figure 1. Category fluency scores are lower on days with more intrusive thoughts

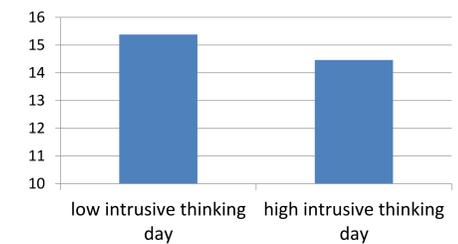


Figure 2. Self-reports of memory problems are higher on days with more intrusive thoughts

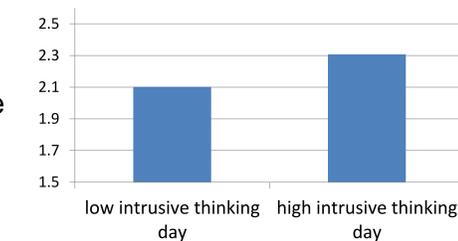
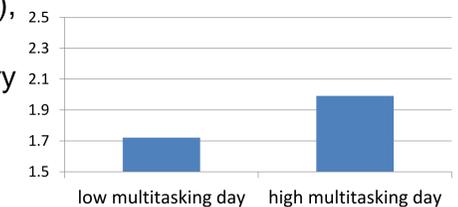


Figure 3. Self-reports of memory problems are higher on days with more multitasking



### Research question 2: Age as a moderator in cognitive interference-daily cognition relationship

- Contrary to expectations, the relationship between cognitive interference and cognition did not differ by age

## Discussion

- Across the adult lifespan, internal sources of cognitive interference associated with the demands of daily life contribute to intraindividual fluctuations in cognitive functioning, specifically executive functioning and self-reports of everyday memory problems
- In future research we will investigate whether compensatory strategy use is associated with reduced cognitive interference
- The results have implications for interventions aimed to improve daily cognition by reducing the role of both daily stress and stress-related cognitive interference in disrupting cognitive functioning processes (Hahn Rickenbach, Almeida, Seeman, Lachman, in press)