

# Development of a novel method to assess spontaneous thought dynamics

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## Introduction

- Spontaneous thoughts (STs) such as mind-wandering represent around **30% of daily cognitive activity**<sup>1</sup>.
- STs continuously shift from one topic to another<sup>2</sup>.
- Commonly used methods (e.g., thought-probes) are **not well suited** to study the **dynamics** of STs.
- Other less used methods (e.g., Think Aloud Paradigm) come at the cost of **extensive and subjective coding**.

## Aims

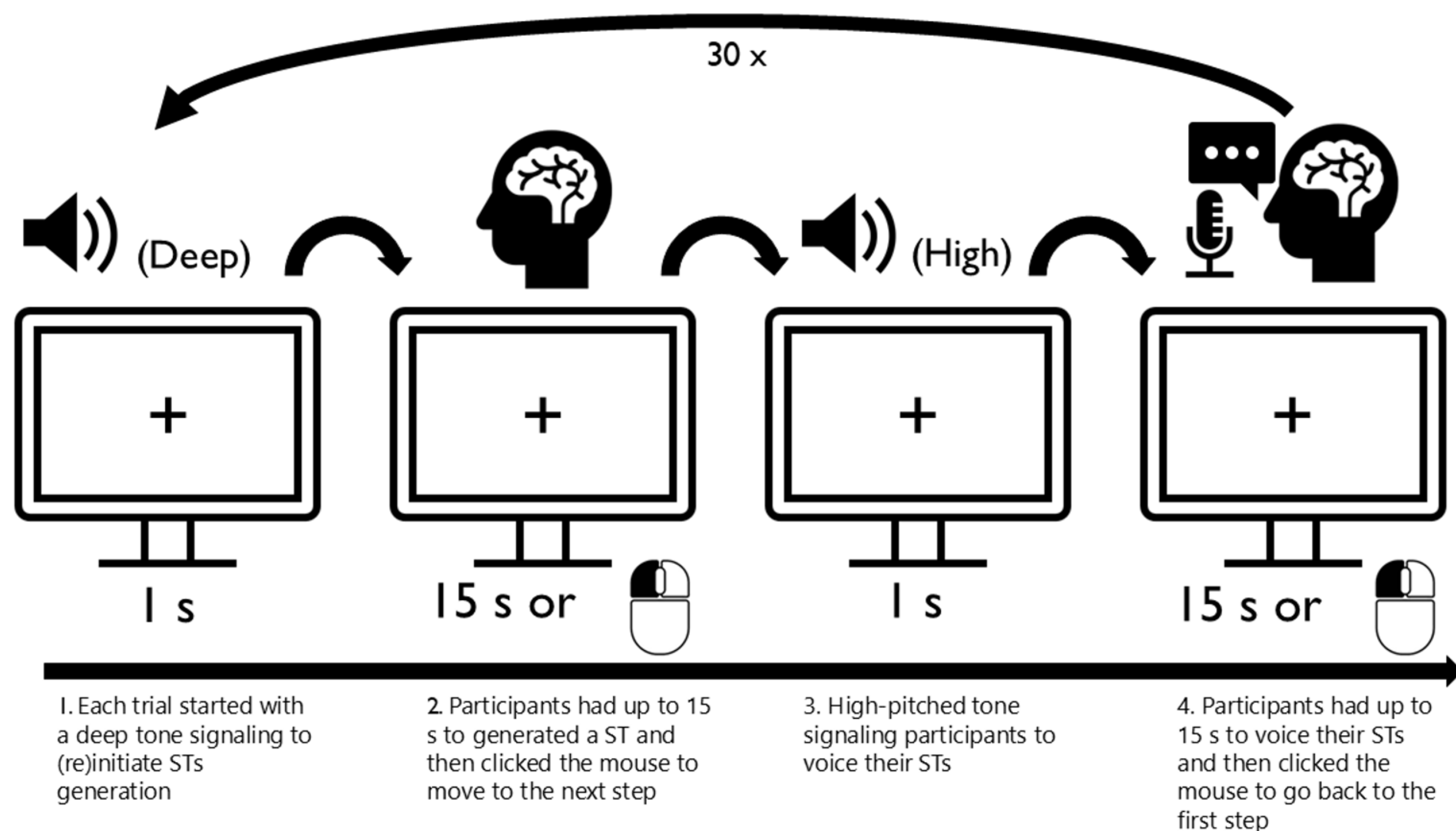
- Develop a **new method** inspired by associative<sup>3</sup> and autobiographical fluency tasks<sup>4</sup> to **investigate the dynamics of STs** while reducing coding cost.
- Replicate key STs features** to validate this method.

## Participants

- Participants ( $N = 35$ ; 30F, 5M) were on average 20.2 ( $SD = 2.92$ ) years old.
- All participants were fluent in French.

## Method

- Participants generated chains of up to 30 consecutive STs, not related to the task or present environment over a span of 15 minutes while being recorded.



- Participants completed questionnaires, including the Personal Concerns Inventory<sup>5</sup> to investigate personal goals.
- Participants next evaluated each reported ST using a Thought Characteristics Questionnaire on several dimensions, including temporal orientation, affective valence, and link to personal goals.

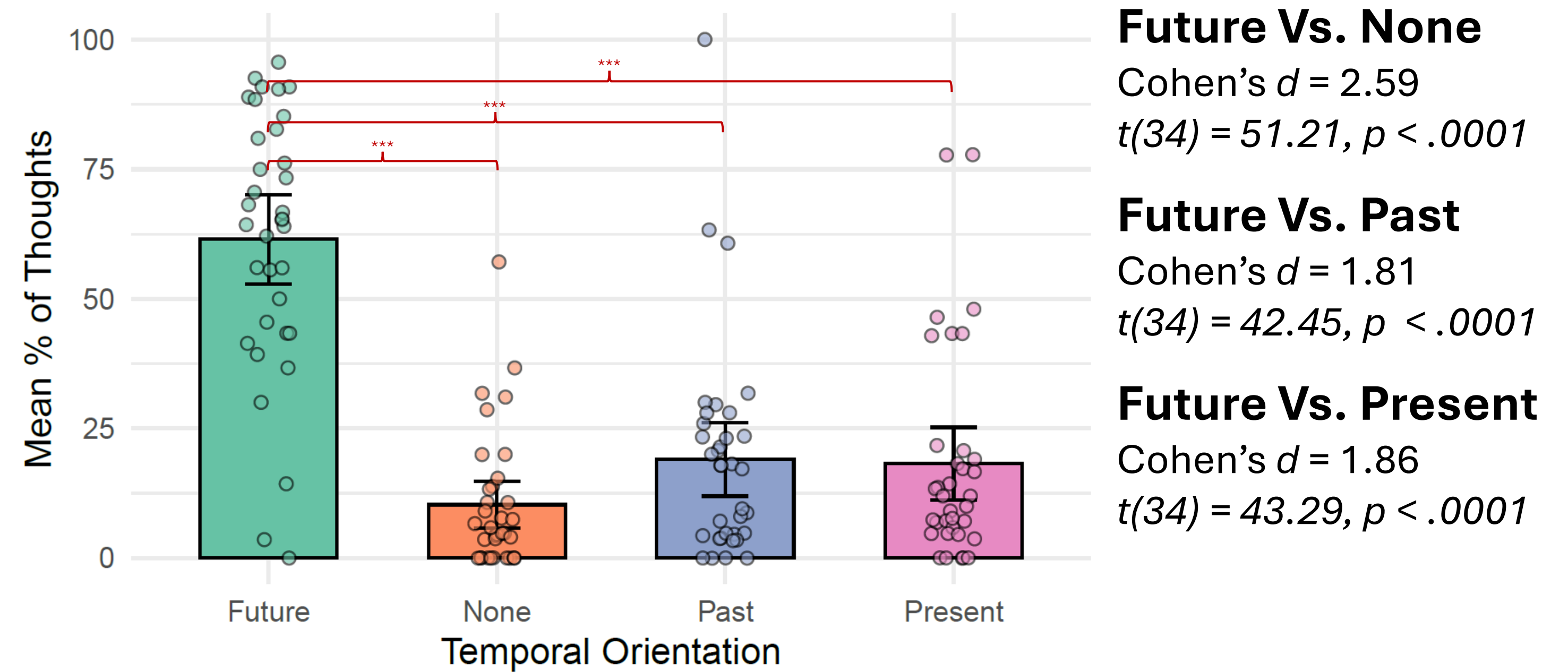
**References :** (1) Smallwood, Jonathan, and Jonathan W. Schooler. "The Science of Mind Wandering: Empirically Navigating the Stream of Consciousness." *Annu Rev Psychol*, vol. 66, no. 1, Jan. 2015, pp. 487–518.; (2) Christoff et al. "Mind-Wandering as Spontaneous Thought: A Dynamic Framework." *Nat Rev Neurosci*, vol. 17, no. 11, 2016, pp. 718–31.; (3) Andrews-Hanna et al. "The Conceptual Building Blocks of Everyday Thought: Tracking the Emergence and Dynamics of Ruminative and Nonruminative Thinking." *J Exp Psychol Gen*, vol. 151, no. 3, 2022, pp. 628–42.; (4) Conti et al. "The Autobiographical Fluency Task: Validity and Reliability of a Tool to Assess Episodic and Autobiographical Memory and Experience-near Personal Semantics." *J Neuropsychol*, Oct. 2023, p. jnp.12351.; (5) Klinger et al. "The Motivational Structure Questionnaire, Personal Concerns Inventory, and Their Variants: Psychometric Properties." *Handbook of Motivational Counseling*, edited by W. Miles Cox and Eric Klinger, 1st ed., Wiley, 2011, pp. 205–32. (6) Sripada, C., & Taxali, A. (2020). Structure in the stream of consciousness: Evidence from a verbalized thought protocol and automated text analytic methods. *Conscious Cogn*, 85, 103007.

## Results

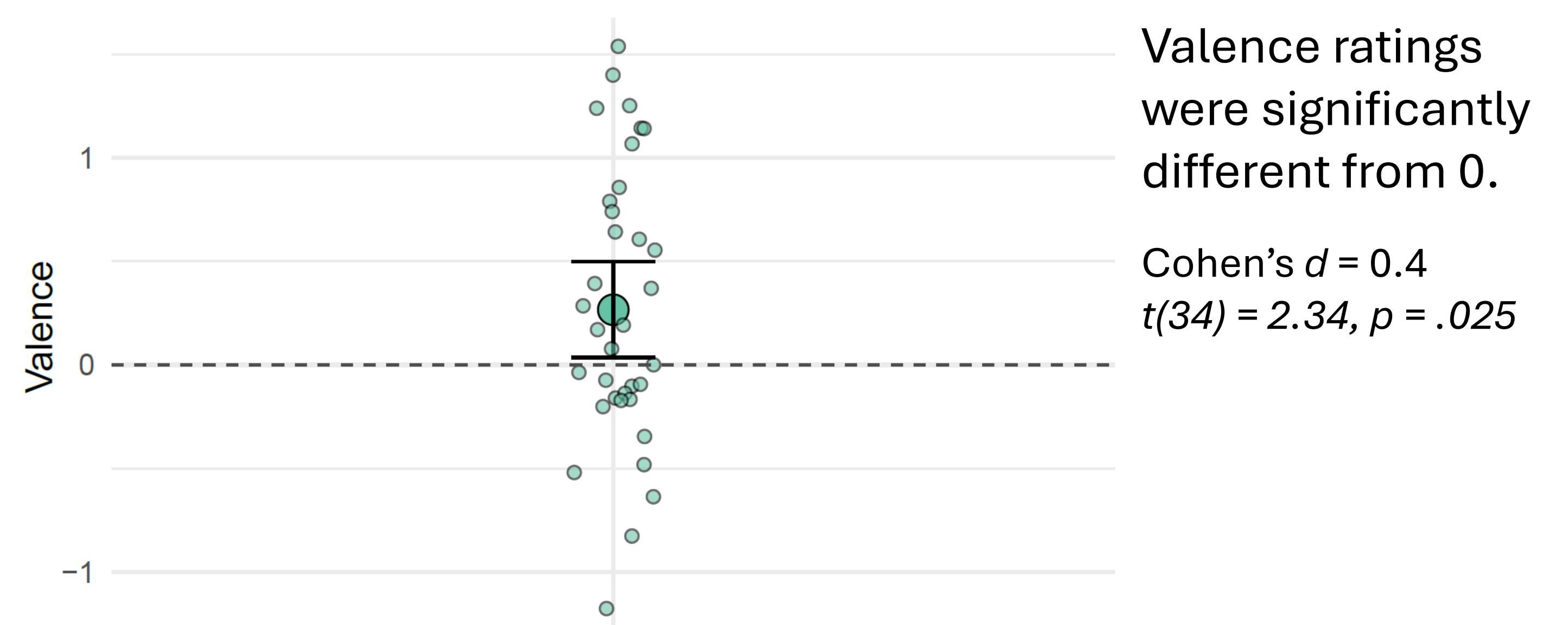
### Descriptive

Measure	Mean (SD)	Min	Max
Number of STs	25.8 (3.42)	17	30
Time to generate (ms)	7084 (2025)	1356	11965
Duration of speech (ms)	7865 (2508)	4168	13470

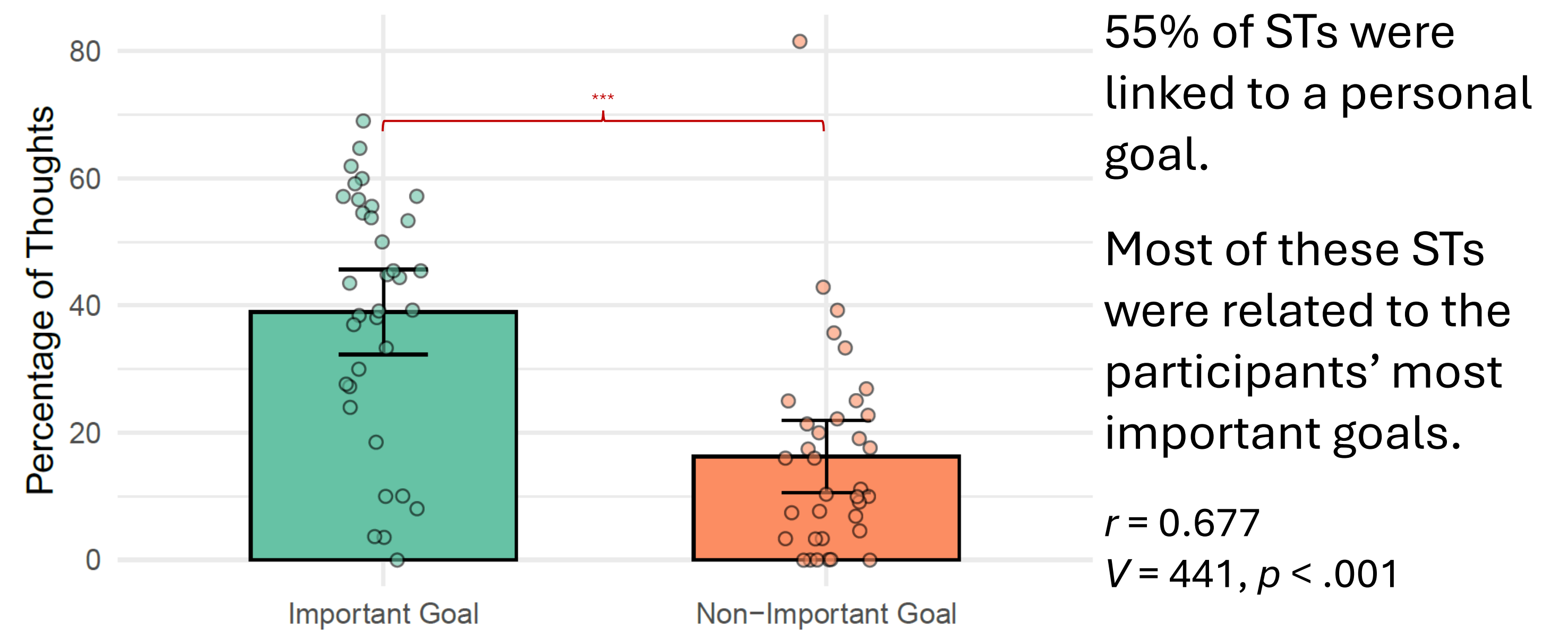
### Prospective Bias ?



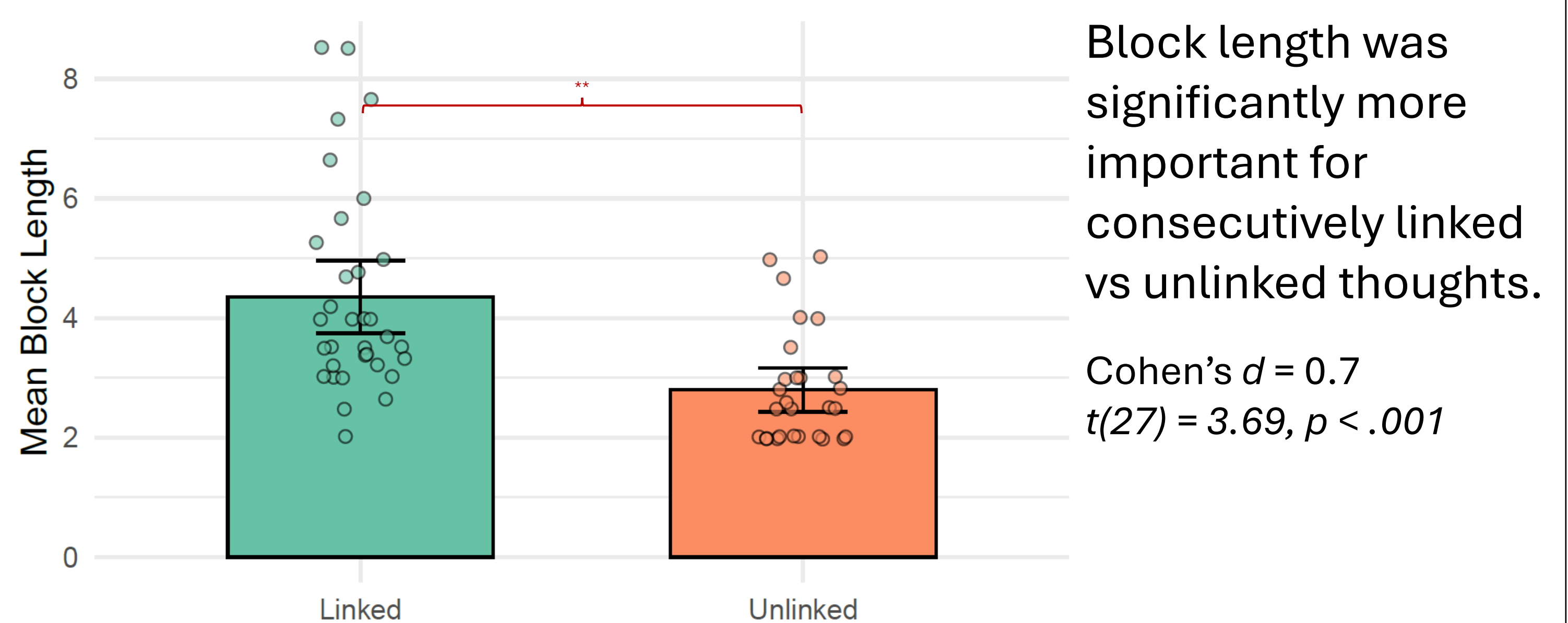
### Positive Affective Valence ?



### Content Related to Personal Goals ?



### Clump and Jump Structure<sup>6</sup> ?



## Conclusion

- These preliminary findings replicate several well-known features of STs.
- They suggest that our method is a promising alternative for studying the characteristics and dynamics of STs and mind-wandering.

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