Mind-Wandering in Autism Spectrum Disorder: An Exploratory Multi-Case Study

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OBJECTIVE

Executive dysfunction has become a substantial topic of interest in autism spectrum disorder (ASD) due to proposed contributions to functional impairments and decreased quality of life. Executive dysfunction in ASD is not conclusive; thus, a novel performance measure to explore a constellation of executive function subsets is *mind-wandering.* This multi-case study aimed to explore mind wandering through the executive failure hypothesis and the meta-awareness hypothesis with autistic teens and young adults.

BACKGROUND

Mind-wandering is the ebb and flow of mental content between intrinsic and extrinsic sources, unrelated or related to the task at hand, and can be further delineated into various subcategories:

- **Unintentional (spontaneous) mind-wandering** = associated with a lack of conscious initiation, poor meta-awareness, and limited feeling of control due to the involuntary nature of these thoughts, although still originating within the individual
- **Intentional (deliberate) mind-wandering** = associated with a conscious process of intention to initiate a mind-wandering episode and includes a component of meta-awareness

Two leading hypotheses underlying mind-wandering are:

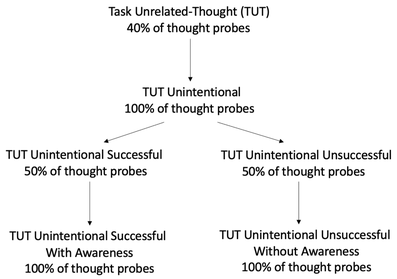
- **Executive failure hypothesis:** individuals with greater executive control are able to attend to task-relevant information, while simultaneously inhibiting task-irrelevant information
- **Meta-awareness hypothesis:** individuals who are more aware of their mental activity and can exert control over their mental activity, should be better able to regulate attention, and thus prevent the onset of unintentional mind-wandering and/or engage in intentional mind-wandering when desired.

METHODS

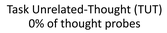
Six autistic individuals with intact intellectual functioning (FSIQ > 80) were extensively investigated using a sustained attention task, thought probes, open-ended interviews, and retrospective trait questionnaires. Executive functioning was samples using DKEFS verbal fluency switching subtest and digit span sequencing tasks. Retrospective trait questionnaires included: Metacognitions Questionnaire-30, Spontaneous and Deliberate Mind-Wandering Scales, and Mind Excessively Wandering Scale.

PROBE-CAUGHT MIND-WANDERING PROFILES

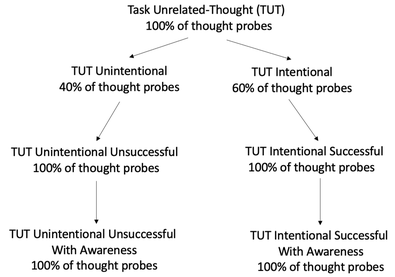
Participant 1



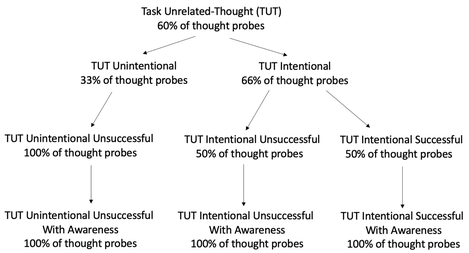
Participant 2



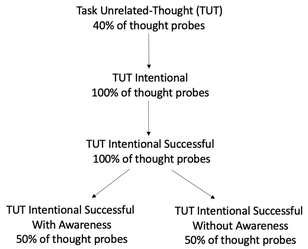
Participant 3



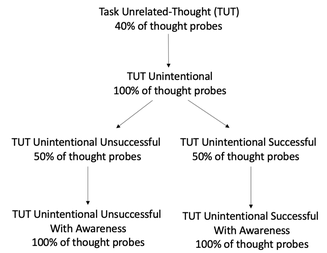
Participant 4



Participant 5



Participant 6



MIND-WANDERING CONTENT SCALES

	Future	Past	Self	Other	Mood	Visual	Auditory	Intrusive	Vague
Participant 1	7	5	6	5	10	8	9	7	8
Participant 2	18◊	7	20◊	8	10	20◊	8	8	5
Participant 3	6	16◊	7	19◊	13◊	20◊	8	17◊	9
Participant 4	6	6	11	9	12◊	11◊	14◊	10	13◊
Participant 5	5	5	6	7	16◊	10	5	7	5
Participant 6	17◊	9	14◊	9	19◊	17◊	8	9	7

Note. Each question was administered five times, therefore response scale for each item is 4-20.

For Mood Content Probe, = >10 is positive, 10 is neutral, <10 is negative; ◊ = total score is considered "high"

EXECUTIVE PROFILES

	Verbal Fluency Switching (ScS)	Digit Span Sequencing (ScS)
Participant 1	17	9
Participant 2	12	10
Participant 3	19	7
Participant 4	13	11
Participant 5	12	11
Participant 6	7	12

CONCLUSION

Responses revealed that the sampled autistic individuals engaged in a variety of task-related, task-unrelated, intentional, unintentional, directed, and undirected mind-wandering events, both with and without awareness. Individuals reported on the occurrence and/or absence of mind-wandering events, intentions behind mind-wandering events, content of mind-wandering events, and on perception and influencing factors of mind-wandering events. Individuals reported experiencing self- and other- referential thought, despite known difficulties with social cognition in this population. Most notably, autistic individuals in this sample reported engaging in intentional mind-wandering without awareness as well as unintentional mind-wandering despite exceptional executive functioning, raising questions about the validity of underlying executive failure and meta-awareness hypotheses in neurodivergent populations.

CLINICAL IMPLICATIONS

Future research should continue to explore how the extent of mind-wandering ability may relate to efficacy of cognitive-dependent interventions (e.g., cognitive-behavioral therapy, mindfulness-based intervention) for certain individuals on the spectrum as well as explore how mind-wandering content and type may inform common diagnostic differentials (e.g., anxiety, depression, attention difficulties). Overall, it is important that future research investigates autistic individuals across the spectrum to appropriately capture the neurocognitive diversity within this neurodivergent population. Autistic individuals are often ignored or overlooked when it comes to research on the substrates of neurocognitive functioning. Rather than attempting to understand how autistic individuals uniquely experience thought, generalizations gleaned from neurotypical populations are applied inaccurately to autistic individuals. Further, when autistic individuals are included in research studies, individual differences among autistic individuals are often not explored and superior qualities compared to neurotypical counterparts are frequently underreported. This research design offers a design template for future research aligned with similar goals.

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