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Examining the relation between mind wandering and unhealthy eating behaviours

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ABSTRACT

In the present study, we explored how individual differences in the tendency to mind-wander are related to unhealthy eating behaviours (i.e., eating habits and eating-disorder symptoms). Given that eating-disorders are associated with inhibition (extreme control) and impulsivity (a lack of control), we were interested in how unhealthy eating behaviours might relate to both spontaneous mind-wandering, which is often construed as a failure of executive control, and deliberate mind-wandering, which is thought to occur via controlled processes. To ensure that any observed relations were not driven by self-control, we also measured and statistically controlled for this variable. In a large, non-clinical sample ($N = 2328$), regression analyses predicting each of the eating measures with self-control, spontaneous mind-wandering, and deliberate mind-wandering revealed that self-control and spontaneous mind-wandering were significantly positively predictive of unhealthy eating behaviours, whereas deliberate mind-wandering did not significantly predict these measures. These findings suggest that spontaneous, but not deliberate, mind-wandering has a robust unique relation with unhealthy eating behaviours, even when controlling for self-control.

1. Introduction

Given the common occurrence of mind-wandering in everyday life (Kane et al., 2007; Killingsworth & Gilbert, 2010; Seli, Beaty, et al., 2018), it is unsurprising that considerable research efforts have been made to understand the causes, correlates, and consequences of this ubiquitous phenomenon (e.g., Carriere et al., 2013; Kane et al., 2007; Kane et al., 2017; Killingsworth & Gilbert, 2010; McVay & Kane, 2012; Mrazek et al., 2012). While mind-wandering has been identified as a multi-dimensional concept (see Seli, Kane, et al., 2018), for present purposes we consider the term 'mind-wandering' to refer to task-unrelated thoughts, which can be either spontaneous or deliberate (Seli, Cheyne, et al., 2015). Research has revealed that the tendency to experience mind-wandering is related to several robust individual traits, including mindfulness, flow proneness, grittiness, conscientiousness, neuroticism (Ralph et al., 2017; Smith et al., 2020; Mrazek et al., 2012; Marty-Dugas & Smilek, 2019; Kane et al., 2017). Here, we extend this line of research by examining the relation between trait-level spontaneous and deliberate mind-wandering and another group of behaviours that might be closely related to mind-wandering: symptoms of eating disorders and poor/unhealthy eating habits.

Eating-disorders include a variety of unhealthy behaviours, cognitions, and emotions pertaining to the everyday task of eating. They typically involve problematic views of one's body weight, fear of gaining weight, restrictive eating habits, and/or excessive eating and a tendency to experience feelings of guilt, embarrassment, or depression (American Psychiatric Association, 2013). Commonly studied eating-disorders include anorexia nervosa, bulimia nervosa, and binge eating-disorder (Galmiche et al., 2019). Some have argued that eating dysfunctions can be construed as a matter of degree, whereby diagnosable eating-disorders anchor the more extreme point on a continuum of healthy to unhealthy eating behaviours (e.g., Attie & Brooks-Gunn, 1989; Dancyger & Garfinkel, 1995; Franko & Omori, 1999). On this view, certain forms of dieting have the potential to turn into an eating-disorder if enough risk factors are present. Others have noted that eating-disorders are qualitatively different from unhealthy eating or dieting (e.g., Striegel-Moore et al., 1989). Both views agree, however, that less extreme unhealthy behaviours can become more extreme over time if they are reinforced (e.g., Herzog et al., 1993; Santonastaso et al., 1999; Włodarczyk-Bisaga & Dolan, 1996). To encompass both of these views, in

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the present study we measured both eating-disorder symptoms and healthy/unhealthy eating habits and have opted to describe these using the general term 'unhealthy eating behaviours'.

There are several reasons why individual differences in unhealthy eating behaviours might be related to individual differences in mind-wandering. First, both traits seem to involve *biased attentional process*. For example, unhealthy eating behaviours sometimes involve biases towards food-related stimuli (e.g., Granero et al., 2014) and mind-wandering can involve biases towards personal concerns (e.g., Klinger et al., 2018). Second, both traits can involve mental *rumination*.[1] Specifically, people may engage in unhealthy eating behaviours to avoid ruminative thoughts (Dondzilo et al., 2016; Startup et al., 2013) and mind-wandering can sometimes involve repetitive negative thoughts (Seli et al., 2017; Smallwood & O'Connor, 2011). The third reason individual differences in unhealthy eating behaviours might be related to individual differences in mind-wandering is that both traits have been related to a *lack of control* (Baraskewich & Climie, 2021; Fürtjes et al., 2020; Seli et al., 2017).

In the present study, we directly examine whether spontaneous and/or deliberate mind-wandering are related to unhealthy eating behaviours. We used online self-report questionnaires to investigate these constructs. Specifically, eating habits and eating-disorder symptomatology were indexed using the Binge Eating Scale (Gormally et al., 1982), the "Starting the Conversation" (STC) Dietary Assessment (Paxton et al., 2011), and the Eating-Disorders Diagnostic Scale (Stice et al., 2000).[2] We assessed trait-level mind-wandering using the Spontaneous and Deliberate Mind-Wandering Scales (Carriere et al., 2013). Finally, given the relation between eating-disorder symptomatology and control, we also included the Brief Self-Control Scale as a proxy for one general ability to control one's behavior (Tangney et al., 2004). The inclusion of this measure allowed us to examine whether any relation between mind-wandering and unhealthy eating behaviours might be explained by one's general ability to control one's behavior.

2. Method

2.1. Participants

Participants were recruited through the University Waterloo's participant pool (the Research Experiences Group: REG). During the first two months of each academic term, *all* participants in the REG have the opportunity to participate in Mass Testing – a battery of online (remote) psychological questionnaires – in exchange for partial course credit. We utilized this procedure to administer the questionnaires of interest. In Fall 2019, of the 3498 participants in the REG, 2350 enrolled in Mass Testing (67 %). We aimed to collect data from as many participants as possible before the window for data collection closed. Data from twenty-two participants were excluded from our analyses due to incomplete datasets. As such, data from 2328 participants were analyzed.

2.2. Measures

The original English version of all scales were administered to participants.

2.2.1. Spontaneous (MW-S) and Deliberate (MW-D) Mind-Wandering Scales

The MW-S is a measure of spontaneous or unintentional mind-wandering, whereas the MW-D is a measure of deliberate or intentional mind-wandering (Carriere et al., 2013). These self-report questionnaires consist of 4 statements each. Participants rated statements such as "I allow my thoughts to wander on purpose" (MW-D), and "I find my thoughts wandering spontaneously" (MW-S), on a 7-point Likert scale from 1 (*rarely)* to 7 (*a lot*). Higher scores indicate a greater tendency to engage in deliberate or spontaneous mind-wandering in everyday life.

2.2.2. Brief Self-Control Scale

The Brief Self-Control Scale (Tangney et al., 2004) is a 13-item measure of self-control. The scale focus on behaviours that reflect general impulsivity, reliability and self-control. Example items include "I am good at resisting temptation", and "People would describe me as impulsive", which are rated on a Likert-type scale ranging from 1 (*not at all*) to 5 (*very much*). Higher scores indicate more self-control.

2.2.3. Binge Eating Scale

The Binge Eating Scale (Gormally et al., 1982) is a measure of binge eating behaviours and cognitions related to a binge eating episode. This self-report questionnaire consists of 16 statement sets. Each statement set contains 4 items. Participants are required to select the item in each set that best describes their eating behavior. Statement sets include items such as "At times, I tend to eat quickly and then, I feel uncomfortable fully afterwards", and "I feel like I have failed to control my eating more than the average person". Higher scores indicate more symptoms of a binge eating-disorder.

2.2.4. "Starting the Conversation" (STC) Dietary Assessment

The STC Dietary Assessment (Paxton et al., 2011) is an 8-item dietary assessment used by clinicians to screen eating habits. Participants are asked to respond to items such as "Over the past few months, how many servings of vegetables did you eat each day?" and "Over the past few months, how many times a week did you eat desserts and other sweets (not the low-fat kind)?". Three response options for each statement are organized from left to right, with the left most option indicating the healthiest dietary practice (scored 0), the middle option a less healthy practice (scored 1), and the right most option indicating the least healthy practice (scored 2). Higher scores indicate unhealthier eating habits.

2.2.5. Eating-Disorders Diagnostic Scale (EDDS; DSM-V)

The Eating-Disorder Diagnostic Scale (Stice et al., 2000) is a 22-item scale which uses DSM-5 criteria to diagnose anorexia, bulimia nervosa, and binge-eating-disorder. Participants are asked to respond to items such as "Has your weight influenced how you think about (judge) yourself as a person", "During the last 6 months have there been times when you felt you have eaten what other people would regard as an unusually large amount of food (e.g., a quart of ice cream) given the circumstances?", and "How many times per week on average over the past 3 months have you fasted (skipped at least 2 meals) in a row to prevent weight gain or counteract the effects of eating?". Responses involve either providing ratings on a scale ranging from 0 (*not at all*) to 6 (*extremely*), indicating "yes" or "no", or indicating the number of times an event occurred. Higher scores indicate more symptoms of eating-disorders.

3. Results

3.1. Descriptive statistics

Descriptive statistics (including reliabilities) for each measure are provided in Table 1. Most scales showed a high level of reliability, with

[1] To be clear, here, we use the term 'rumination' not to refer to the act of regurgitating (and sometimes re-chewing and re-swallowing) one's food as is the case in rumination disorder described in the DSM-V; rather we use the term to refer to "the cognitive process in which one repetitively and passively focuses on the meaning, causes, and consequences of negative emotions" (Smith, Mason, & Lavender, 2018, p. 10).

[2] Prior work has demonstrated that the BES and EDDS are reliable and valid measures of eating disorder symptoms in both clinical and non-clinical samples (BES: Duarte et al., 2015; EDDS: Krabbenborg et al., 2012).

Table 1
Descriptive statistics for self-report measures.

Measure	N	Mean (SD)	Skew	Kurtosis	Cronbach's α
MW-S	2288	4.11 (1.37)	−0.07	−0.34	0.90
MW-D	2289	4.25 (1.44)	−0.15	−0.49	0.89
BSCS	2326	3.10 (0.68)	0.06	−0.21	0.84
BES	2289	10.30 (7.92)	1.12	1.25	0.92
STC	2298	6.86 (2.55)	0.05	0.03	0.68
EDDS	2328	0.00 (10.99)	1.21	0.94	0.75

Note: MW-S = Spontaneous Mind-Wandering, MW-D = Deliberate Mind-Wandering, BSCS = Brief Self Control Scale, BES = Binge Eating Scale, STC = STC Dietary Assessment, EDDS = Eating-Disorder Diagnostic Scale-DSM V. Descriptive statistics for the EDDS are calculated using standardized scores.

Cronbach alphas of 0.75 or greater. However, the STC had a lower reliability of 0.68. For completeness, we include this scale in the correlation table and regression analyses, but we opted not to interpret the STC results in the Discussion.

3.2. Correlations

First, we examined the relations among spontaneous and deliberate mind-wandering, self-control, and the eating habit measures using correlational analyses. Histograms of questionnaire responses revealed that the BES and EDDS were negatively skewed, while the BSCS, MW-D, and MW-S were normally distributed. As such, we conducted both Pearson and Spearman correlations. These correlations are provided in Table 2. While we were primarily interested in the association between the mind-wandering scales and the aforementioned eating habit measures (BES, STC, EDDS), for completeness, we include the correlations between all measures. As can be seen in Table 2, we found a significant negative correlation between self-control (BSCS) and both deliberate and spontaneous mind-wandering (MW-D and MW-S). Deliberate and spontaneous mind-wandering were also positively related to binge eating (BES), such that individuals who reported more binge eating tended to report more frequent mind-wandering. Scores on the STC—a measure of unhealthy eating habits—were significantly and positively related to deliberate and spontaneous mind-wandering, indicating that individuals reporting unhealthier eating habits are more likely to report higher rates of deliberate and spontaneous mind-wandering. Finally, eating-disorder symptomatology (measured via the EDDS) had a significant and positive relation with deliberate and spontaneous mind-wandering.

3.3. Regressions

To control for the shared variance between the mind-wandering scales, and between self-control and the measures of eating habits, we conducted a series of regressions.[3] When predicting each measure of eating habits, we conducted a hierarchical regression. In the first step, we entered BSCS as a predictor, and then in the second step, added MW-D and MW-S as additional predictors together with BSCS.

3.3.1. BES

In the first step with only the BSCS predicting the BES (see Supplementary Table 1; Model 1a), we found that scores on the BSCS explained significant variance in the BES ($R^2 = 0.12$, $F(1,2222) = 316.30$, $p < .001$). Self-control was also a significant predictor of the BES ($\beta = -0.35$, $p < .001$). In the second step, we added the MW-S and MW-D to determine whether spontaneous and/or deliberate mind-wandering would account for additional variance over and above a measure of self-control. The overall model remained significant ($R^2 = 0.14$, $F(3,2220) = 119.70$, $p < .001$; see Supplementary Table 1; Model 1b). The results showed that collectively, the mind-wandering measures accounted for a significant amount of additional variance in BES over and above what was accounted for by BSCS ($\Delta R^2 = 0.02$, $p < .001$). We also found that the BSCS remained a significant predictor of BES ($\beta = -0.29$, $p < .001$), and that MW-S was a significant unique predictor of BES scores ($\beta = 0.14$, $p < .001$), while MW-D was not ($\beta = -0.02$, $p = .437$).

3.3.2. STC

The first step predicting the STC dietary assessment (see Supplementary Table 2; Model 2a) revealed that the BSCS was a significant predictor of the STC ($\beta = -0.28$, $p < .001$) and explained significant variance in the STC ($R^2 = 0.08$, $F(1,2264) = 199.60$, $p < .001$). Following the MW-D and MW-S in step two, the model continued to account for significant variance in the STC ($R^2 = 0.09$, $F(3,2262) = 70.08$, $p < .001$; see Supplementary Table 2; Model 2b). The MW-D and MW-S accounted for significant additional variance over and above self-control, $\Delta R^2 = 0.01$, $p = .007$. Following the addition of the MW-S and MW-D, BSCS continued to be a significant predictor ($\beta = -0.25$, $p < .001$). MW-S was also a unique and significant predictor of the STC in step two ($\beta = 0.06$, $p = .013$), while the MW-D did not significantly predict STC scores ($\beta = 0.02$, $p = .411$).

3.3.3. EDDS

In step one, we found that scores on the BSCS accounted for significant variance in EDDS scores ($R^2 = 0.10$, $F(1,2254) = 255.90$, $p < .001$; see Supplementary Table 3; Model 3a). We also found self-control was a significant predictor of EDDS ($\beta = -0.32$, $p < .001$). In step two, the BSCS, MW-S and MW-D also explained significant variance in the EDDS ($R^2 = 0.11$, $F(3,2252) = 97.33$, $p < .001$; see Supplementary Table 3; Model 3b). The addition of the MW-D and MW-S accounted for significant additional variance over and above BSCS ($\Delta R^2 = 0.01$, $p < .001$). BSCS continued to be a unique and significant predictor of EDDS scores ($\beta = -0.27$, $p = .411$). MW-S was also a significant predictor ($\beta = 0.14$, $p < .001$), however, MW-D was not a unique significant predictor of EDDS ($\beta = -0.04$, $p = .058$).

4. Discussion

In the present study, we found that there were statistically significant and positive relations between both spontaneous and deliberate mind-wandering and unhealthy eating behaviours (as measured by the EDDS and BES), such that those with more problematic eating habits tended to experience more spontaneous and deliberate mind-wandering. Furthermore, regression analyses revealed that, together, spontaneous and deliberate mind-wandering accounted for unique variance in measures of unhealthy eating behavior over and above variance accounted for by a general measure of self-control. Importantly, however, only spontaneous mind-wandering—and not deliberate mind-wandering—uniquely predicted unhealthy eating behavior. These results are consistent with prior studies showing a dissociation between deliberate and spontaneous mind-wandering (Giambra, 1995; Robison & Unsworth, 2018; Seli et al., 2016).

Interestingly, we found that unhealthy eating behaviours were uniquely and independently predicted by general self-control behaviours (here indexed by the BSCS) and by failures of cognitive control in the form of spontaneous mind-wandering (here indexed by the MWS). These results suggest that control over behaviours (i.e., behavioural impulsivity) and control over attentional deployment might involve distinct control processes, each of which are involved in unhealthy eating habits. That being said, the unique contribution of spontaneous mind-wandering does over and above self-control was quite small, possibly because both types of control are strongly interrelated. We highlight that understanding the contribution of the (many) factors that are related to unhealthy eating behaviours are important when it comes

[3] Prior work has found that regressions are robust to violations of normality in large samples (see Li et al., 2012; Lumley et al., 2002; Schmidt & Finan, 2018)

Table 2
Correlations among variables.

Measure	N	1	2	3	4	5	6
1. MW-D	2289	–	0.44**	−0.25**	0.11**	0.11**	0.08**
2. MW-S	2288	0.42**	–	−0.45**	0.27**	0.18**	0.24**
3. BSCS	2326	−0.23**	−0.43**	–	−0.36**	−0.28**	−0.32**
4. BES	2289	0.11**	0.27**	−0.34**	–	0.16**	0.73**
5. STC	2298	0.10**	0.17**	−0.27**	0.17**	–	0.13**
6. EDDS	2328	0.09**	0.26**	−0.32**	0.70**	0.13**	–

Note.
Above the diagonal are Pearson correlations; below the diagonal are Spearman correlations.
MW-S = Spontaneous Mind-Wandering, MW-D = Deliberate Mind-Wandering, BSCS = Brief Self Control Scale, BES = Binge Eating Scale, STC = STC Dietary Assessment, EDDS = Eating-Disorder Diagnostic Scale-DSM V.
** $p < .001$.

to exploring possible new treatments for eating-disorders. For example, there the intriguing possibility that those suffering with eating-disorders might not only benefit from interventions focused on reigning in impulsive behaviours, but also from interventions that increase attentional control (e.g., mindfulness training; Mrazek et al., 2012; Mrazek et al., 2013).

The present work also suggests several other avenues for future research. First, here we focused on self-reports of (or perceptions of) participants' mind-wandering and unhealthy eating behaviours, but these subjective reports have limitations. Self-reports are metacognitive judgments and the accuracy of these depends on self-monitoring and memory (e.g., Koriat & Shitzer-Reichert, 2002). Future work could correlate behavioural measures of mind-wandering (collected via thought probes) during a cognitive task with food diaries from the preceding week to further examine the relation between attentional engagement and unhealthy eating behaviours. Second, we used a convenience sample of healthy undergraduate students and it is possible that in a clinical sample of individuals diagnosed with an eating-disorder the relation between mind-wandering and eating-disorder symptoms may differ. Future studies may wish to recruit non-clinical and clinical samples, as well as clinical samples diagnosed with specific eating-disorder diagnoses (e.g., AN, BN, BES) to examine if these relations differ between groups. Finally, it would be worth examining whether spontaneous mind-wandering and unhealthy eating behaviours are related because of a common association with affective dysfunction (see Seli et al., 2019; Startup et al., 2013).

CRediT authorship contribution statement

Alyssa C. Smith: Formal analysis, Methodology, Data curation, Writing – original draft, Writing – review & editing. **Nicholaus P. Brosowsky:** Conceptualization, Methodology, Formal analysis, Data curation, Writing – review & editing. **Emilie E. Caron:** Writing – review & editing. **Paul Seli:** Conceptualization, Methodology, Supervision, Writing – review & editing. **Daniel Smilek:** Supervision, Methodology, Writing – review & editing.

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Anonymized data and data analysis scripts will be available upon acceptance at https://osf.io/5c7ej/.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.paid.2022.111908.

References

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders (DSM-5®)*. American Psychiatric Pub.
Attie, I., & Brooks-Gunn, J. (1989). Development of eating problems in adolescent girls: A longitudinal study. *Developmental Psychology, 25*(1), 70.
Baraskewich, J., & Climie, E. A. (2021). The relation between symptoms of ADHD and symptoms of eating disorders in university students. *The Journal of General Psychology*, 1–15.
Carriere, J. S., Seli, P., & Smilek, D. (2013). Wandering in both mind and body: Individual differences in mind wandering and inattention predict fidgeting. *Canadian Journal of Experimental Psychology/Revue canadienne de psychologie expérimentale, 67*(1), 19.
Dancyger, I. F., & Garfinkel, P. E. (1995). The relationship of partial syndrome eating disorders to anorexia nervosa and bulimia nervosa1. *Psychological Medicine, 25*(5), 1019–1025.
Dondzilo, L., Rieger, E., Palermo, R., Byrne, S., & Bell, J. (2016). Association between rumination factors and eating disorder behaviours in young women. *Advances in Eating Disorders, 4*(1), 84–98. https://doi.org/10.1080/21662630.2015.1118642
Duarte, C., Pinto-Gouveia, J., & Ferreira, C. (2015). Expanding binge eating assessment: Validity and screening value of the binge eating scale in women from the general population. *Eating Behaviors, 18*, 41–47.
Franko, D. L., & Omori, M. (1999). Subclinical eating disorders in adolescent women: A test of the continuity hypothesis and its psychological correlates. *Journal of Adolescence, 22*(3), 389–396.
Fürtjes, S., King, J. A., Goeke, C., Seidel, M., Goschke, T., Horstmann, A., & Ehrlich, S. (2020). Automatic and controlled processing: Implications for eating behavior. *Nutrients, 12*(4), 1097.
Galmiche, M., Déchelotte, P., Lambert, G., & Tavolacci, M. P. (2019). Prevalence of eating disorders over the 2000–2018 period: A systematic literature review. *The American Journal of Clinical Nutrition, 109*(5), 1402–1413.
Giambra, L. M. (1995). A laboratory method for investigating influences on switching attention to task-unrelated imagery and thought. *Consciousness and Cognition, 4*(1), 1–21.
Gormally, J., Black, S., Daston, S., & Rardin, D. (1982). The assessment of binge eating severity among obese persons. *Addictive Behaviors, 7*(1), 47–55.
Granero, R., Hilker, I., Agüera, Z., Jiménez-Murcia, S., Sauchelli, S., Islam, M. A. Fernández-Aranda, F., … (2014). Food addiction in a spanish sample of eating disorders: DSM-5 diagnostic subtype differentiation and validation data. *European Eating Disorders Review, 22*(6), 389–396.
Herzog, D. B., Hopkins, J. D., & Burns, C. D. (1993). A follow-up study of 33 subdiagnostic eating disordered women. *International Journal of Eating Disorders, 14*(3), 261–267.
Kane, M. J., Brown, L. H., McVay, J. C., Silvia, P. J., Myin-Germeys, I., & Kwapil, T. R. (2007). For whom the mind wanders, and when: An experience-sampling study of working memory and executive control in daily life. *Psychological Science, 18*(7), 614–621.
Kane, M. J., Gross, G. M., Chun, C. A., Smeekens, B. A., Meier, M. E., Silvia, P. J., & Kwapil, T. R. (2017). For whom the mind wanders, and when, varies across laboratory and daily-life settings. *Psychological Science, 28*(9), 1271–1289. https://doi.org/10.1177/0956797617706086
Killingsworth, M. A., & Gilbert, D. T. (2010). A wandering mind is an unhappy mind. *Science, 330*(6006), 932-932.
Klinger, E., Koster, E. H., & Marchetti, I. (2018). Spontaneous thought and goal pursuit: From functions such as planning to dysfunctions such as rumination. In *The Oxford handbook of spontaneous thought: Mind-wandering, creativity, and dreaming* (p. 215).
Koriat, A., & Shitzer-Reichert, R. (2002). Metacognitive judgments and their accuracy. In *Metacognition* (pp. 1–17). Boston, MA: Springer.
Krabbenborg, M. A., Danner, U. N., Larsen, J. K., van der Veer, N., van Elburg, A. A., de Ridder, D. T.Engels, R. C., … (2012). The eating disorder diagnostic scale: Psychometric features within a clinical population and a cut-off point to differentiate clinical patients from healthy controls. *European Eating Disorders Review, 20*(4), 315–320.
Li, X., Wong, W., Lamoureux, E. L., & Wong, T. Y. (2012). Are linear regression techniques appropriate for analysis when the dependent (outcome) variable is not

normally distributed? *Investigative Ophthalmology & Visual Science, 53*(6), 3082–3083.
Lumley, T., Diehr, P., Emerson, S., & Chen, L. (2002). The importance of the normality assumption in large public health data sets. *Annual Review of Public Health, 23*(1), 151–169.
Marty-Dugas, J., & Smilek, D. (2019). Deep, effortless concentration: Re-examining the flow concept and exploring relations with inattention, absorption, and personality. *Psychological Research, 83*(8), 1760–1777. https://doi.org/10.1007/s00426-018-1031-6
McVay, J. C., & Kane, M. J. (2012). Why does working memory capacity predict variation in reading comprehension? On the influence of mind wandering and executive attention. *Journal of Experimental Psychology: General, 141*(2), 302.
Mrazek, M. D., Franklin, M. S., Phillips, D. T., Baird, B., & Schooler, J. W. (2013). Mindfulness training improves working memory capacity and GRE performance while reducing mind wandering. *Psychological Science, 24*(5), 776–781.
Mrazek, M. D., Smallwood, J., & Schooler, J. W. (2012). Mindfulness and mind-wandering: Finding convergence through opposing constructs. *Emotion, 12*(3), 442–448. https://doi.org/10.1037/a0026678
Paxton, A. E., Strycker, L. A., Toobert, D. J., Ammerman, A. S., & Glasgow, R. E. (2011). Starting the conversation: Performance of a brief dietary assessment and intervention tool for health professionals. *American Journal of Preventive Medicine, 40*(1), 67–71.
Ralph, B. C. W., Wammes, J. D., Barr, N., & Smilek, D. (2017). Wandering minds and wavering goals: Examining the relation between mind wandering and grit in everyday life and the classroom. *Canadian Journal of Experimental Psychology/Revue Canadienne de Psychologie Expérimentale, 71*(2), 120–132. https://doi.org/10.1037/cep0000116
Robison, M. K., & Unsworth, N. (2018). Cognitive and contextual correlates of spontaneous and deliberate mind-wandering. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 44*(1), 85.
Santonastaso, P., Friederici, S., & Favaro, A. (1999). Full and partial syndromes in eating disorders: A 1-year prospective study of risk factors among female students. *Psychopathology, 32*(1), 50–56.
Schmidt, A. F., & Finan, C. (2018). Linear regression and the normality assumption. *Journal of Clinical Epidemiology, 98*, 146–151.
Seli, P., Beaty, R. E., Cheyne, J. A., Smilek, D., Oakman, J., & Schacter, D. L. (2018). How pervasive is mind wandering, really? *Consciousness and Cognition, 66*, 74–78.
Seli, P., Beaty, R. E., Marty-Dugas, J., & Smilek, D. (2019). Depression, anxiety, and stress and the distinction between intentional and unintentional mind wandering. *Psychology of Consciousness: Theory, Research, and Practice, 6*(2), 163.
Seli, P., Cheyne, J. A., Xu, M., Purdon, C., & Smilek, D. (2015). Motivation, intentionality, and mind wandering: Implications for assessments of task-unrelated thought. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 41*(5), 1417–1425. https://doi.org/10.1037/xlm0000116
Seli, P., Kane, M. J., Smallwood, J., Schacter, D. L., Maillet, D., Schooler, J. W., & Smilek, D. (2018). Mind-wandering as a natural kind: A family-resemblances view. *Trends in Cognitive Sciences, 22*(6), 479–490.
Seli, P., Risko, E. F., Purdon, C., & Smilek, D. (2017). Intrusive thoughts: Linking spontaneous mind wandering and OCD symptomatology. *Psychological Research, 81*(2), 392–398.
Seli, P., Risko, E. F., & Smilek, D. (2016). On the necessity of distinguishing between unintentional and intentional mind wandering. *Psychological Science, 27*(5), 685–691.
Smallwood, J., & O'Connor, R. C. (2011). Imprisoned by the past: Unhappy moods lead to a retrospective bias to mind wandering. *Cognition & Emotion, 25*(8), 1481–1490.
Smith, A. C., Marty-Dugas, J., Ralph, B. C. W., & Smilek, D. (2020). Examining the relation between grit, flow, and measures of attention in everyday life. *Psychology of Consciousness: Theory, Research, and Practice*. https://doi.org/10.1037/cns0000226. In press.
Smith, K., E., Mason, T., B., & Lavender, J., M. (2018). Rumination and eating disorder psychopathology: A meta-analysis. *Clinical Psychology Review, 61*, 9–23. https://doi.org/10.1016/j.cpr.2018.03.004
Startup, H., Lavender, A., Oldershaw, A., Stott, R., Tchanturia, K., Treasure, J., & Schmidt, U. (2013). Worry and rumination in anorexia nervosa. *Behavioural and Cognitive Psychotherapy, 41*(3), 301.
Stice, E., Telch, C. F., & Rizvi, S. L. (2000). Development and validation of the eating disorder diagnostic scale: A brief self-report measure of anorexia, bulimia, and binge-eating disorder. *Psychological Assessment, 12*(2), 123.
Striegel-Moore, R. H., Silberstein, L. R., Frensch, P., & Rodin, J. (1989). A prospective study of disordered eating among college students. *International Journal of Eating Disorders, 8*(5), 499–509.
Tangney, J. P., Baumeister, R. F., & Boone, A. L. (2004). High self-control predicts good adjustment, less pathology, better grades, and interpersonal success. *Journal of Personality, 72*(2), 271–322.
Włodarczyk-Bisaga, K., & Dolan, B. (1996). A two-stage epidemiological study of abnormal eating attitudes and their prospective risk factors in polish schoolgirls. *Psychological Medicine, 26*(5), 1021–1032.