Supplementary material

1.1. Study 1 – Exploratory analysis of the characteristics of SDTs versus TRIs

In the current experiment, TRIs were not of primary interest – this category was included mainly to exclude these thoughts from the SDT and SIT categories. Furthermore, participants reported few TRIs overall (the 40 participants reported a total of 174 TRIs, versus 316 SDTs and 633 SITs), limiting the confidence in conclusions one can draw regarding their characteristics. Nevertheless, we performed an exploratory analysis of the characteristics of SDTs versus TRIs, given that both thought types are in some ways both "task-related" (SDTs are triggered by a task stimulus, whereas TRIs are thoughts about the task that were not triggered by any particular stimulus), raising the question of whether these thought types share similar characteristics. Descriptive statistics for TRIs are presented in Table 1. We performed linear and logistic mixed model analyses to assess differences in the characteristics of SDTs and TRIs. For each model, thought type (SDTs/TRIs), task (word/number) and the thought type by task interaction were entered as fixed effects. For random effects, we had intercepts for subjects and we also included subjects as a random slope by the interaction of thought type and task. For current concerns and vividness, a model with maximal random effects structure was used. For meta-awareness, a model with maximal random effects structure failed to converge, so a model with uncorrelated intercept and slope was used.

For temporality, we focused our analysis on "past" and "present" responses given our previous finding that SDTs are primarily past-oriented (Maillet & Schacter, 2016), and also that one would expect TRIs to primarily be present-oriented (because TRIs are thoughts about the ongoing task). We thus performed a logistic mixed effects analysis with "past" responses coded as 0 and "present" responses coded as 1. We failed to find a model that converged, even with

minimal random effect structure. We instead analyzed this data using a task (word/number) by temporality (past/present) by thought type (SDT/TRI) ANOVA. Nineteen participants had at least one SDT and one TRI and were included in this analysis. There was a significant thought type by temporality interaction, $F(1, 18) = 12.71$, $p < 0.005$, $n^2p = 0.41$. The interaction was due to SDTs being more past-oriented compared to TRIs, $F(1, 18) = 6.23$, $p = 0.02$, $n^2p = 0.26$, whereas TRIs were more present-oriented compared to SDTs, $F(1, 18) = 9.95$, $p = 0.005$, $n^2p = 0.36$. Also, whereas SDTs were more likely to be past- versus present-oriented, $F(1,18) = 4.36$, $p = 0.05$, $n^2p = 0.20$, TRIs were more likely to be present versus past-oriented, $F(18) = 10.54$, $p < 0.005$, $n^2p = 0.37$.

For current concerns, there was a marginal thought type by task interaction (b = -0.64, SE = 0.36, t = -1.79, $p = 0.08$). The interaction was due to SDTs being rated as more relevant to current concerns in the word versus the number task (b = 0.63, SE = 0.24, t = 2.64, $p = 0.01$), whereas there was no such difference for TRIs (b = 0.01, SE = 0.28, t = 0.03, $p = 0.98$). Also, although the effect was not very strong, SDTs were rated as more relevant to current concerns than TRIs in the word task (b = 0.54, SE = 0.27, t = 2.02, p =0.05) but not the number task (b = 0.10, SE = 0.26, t = 0.4, p = 0.69).

Similarly, for vividness, there was a thought type by task interaction (b = -0.64, SE = 0.3, t = -2.10, $p = 0.04$). The interaction was due to SDTs being rated as more vivid in the word versus the number task (b = 0.52, SE = 0.20, t = 2.57, $p = 0.01$) whereas there was no such difference for TRIs (b = 0.14, SE = 0.23, t = 0.61, $p = 0.54$) Also, SDTs were rated as more vivid than TRIs in the word task (b = 0.50, SE = 0.23, t = 2.19, $p = 0.04$) but not the number task (b = 0.15, SE = 0.24, t = 0.62, $p = 0.54$).

For meta-awareness, an initial model revealed no task by thought type interaction (p = 0.41). A follow-up model without the interaction term revealed a trend for SDTs to be rated as occurring with meta-awareness more often than TRIs (b = 0.49, SE = 0.27, Z = -1.81, p = 0.07).

1.2. Study 1 – Discussion of differences in the characteristics of SDTs versus TRIs

Only SDTs, but not TRIs, were rated as more vivid in the word versus the numbers task and SDTs were rated as more vivid than TRIs in the word, but not the number task. The same effects were found for relevance to current concerns although at a trend level. Thus, only the characteristics of SDTs, but not or TRIs, were affected by the task manipulation, consistent with the idea that SDTs are thoughts about particular stimuli and are thus sensitive to the nature of these stimuli, whereas TRIs are thoughts about the task generally and so should be less affected by the nature of task stimuli. In addition, across tasks, SDTs were more past-oriented compared to TRIs whereas TRIs where more present-oriented. This suggests that TRIs are primarily thoughts about the task itself (which is occurring in the present), whereas SDTs are primarily temporally oriented thoughts. Finally, there was a trend for SDTs to be rated as occurring with meta-awareness more often than TRIs. Collectively, these results suggest that although both SDTs and TRIs are at some level both related to the ongoing task, they nevertheless have distinct characteristics.

2.1. Study 2 – Characteristics of SDTs versus TRIs

We again performed linear and logistic mixed model analyses to assess differences in the characteristics of SDTs and TRIs. For each model, thought type (SDTs/TRIs), task (word/number) and the thought type by task interaction were entered as fixed effects. For random effects, we had intercepts for subjects and we also included subjects as a random slope

by the main effect of thought type. We used models with maximal random effects structure in all cases.

For temporality, similarly to Experiment 1, we focused on past- and present-oriented responses. An initial model revealed no thought type by task interaction ($p = 0.20$). A second model without the interaction term revealed a significant thought type main effect (b = 4.14, SE = 0.83, Z = 5, $p < 0.001$). The odds ratio indicated that the odds of TRIs being about the present versus the past were 62.80 times higher than for SDTs. Predicted probabilities indicated that SDTs had a 0.11 probability (95% CI = [0.05, 0.23], SE = 0.47) of being about the present versus the past, whereas for TRIs, the probability was 0.88 (95% CI = [0.67, 0.96], SE = 0.66). To be consistent with the analysis conducted in Experiment 1, We also analyzed the temporality data using a task (word/number) by temporality (past/present) by thought type (SDT/TRI) ANOVA. 39 participants (15 in the deep and 24 in the shallow condition) had at least on SDT and one TRI and were included in this analysis. There was a significant thought type by temporality interaction, $F(1, 37) = 17.58$, $p < 0.001$, $n^2p = 0.32$. The interaction was due to SDTs being more past-oriented compared to TRIs, $F(1, 38) = 6.41$, $p = 0.02$, $n^2p = 0.14$, whereas TRIs were more present-oriented compared to SDTs, $F(1, 38) = 32.32$, $p < 0.001$, $n^2p = 0.46$.

For current concerns, an initial model revealed no thought type by task interaction (p = 0.65). A second model without the interaction term revealed a main effect of thought type (b = 0.92, SE = 0.24, t = 3.81, $p < 0.001$) due to SDTs being rated as more relevant to current concerns than TRIs. For vividness and meta-awareness, we found no main effects or interactions (all $p > 0.07$).

2.2. Study 2 - Discussion of differences in the characteristics of SDTs versus TRIs

Replicating the results of Experiment 1, SDTs were more likely than TRIs to be past-oriented, whereas TRIs were more likely to be present-oriented. In Experiment 1, there was a trend for SDTs to be rated as more relevant to current concerns compared to TRIs; in Experiment 2, this effect was highly significant ($p < 0.001$). Regarding meta-awareness, we found no significant effects in either experiment. Finally, in Experiment 1, only SDTs, but not TRIs were rated as more vivid in the word task. In Experiment 2, no differences in vividness were observed between SDTs and TRIs when using a shallow and a deep encoding task.

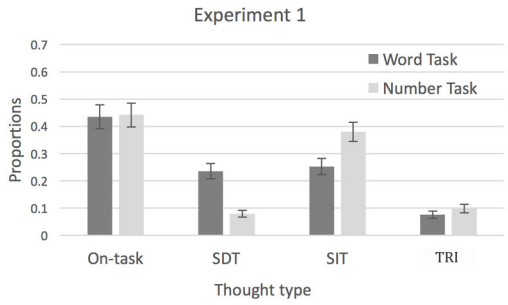
Supplementary References

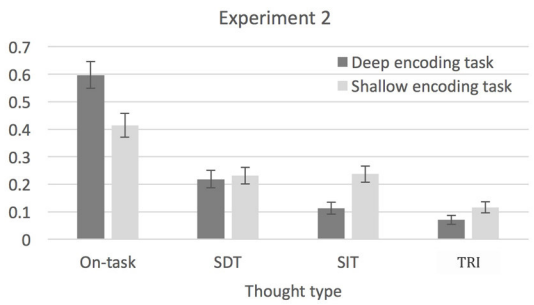
Maillet, D., & Schacter, D. L. (2016). When the mind wanders: Distinguishing stimulus-dependent from stimulus-independent thoughts during incidental encoding in young and older adults. *Psychol Aging, 31*(4), 370-379.

Supplementary Table 1 – Characteristics of task-related interferences

		Experiment 1 Word task	Experiment 1 Number task	Experiment 2 Deep encoding	Experiment 2 Shallow encoding
Current Concerns		2.56 (1.82)	2.42 (1.66)	2.13 (1.70)	2.38 (1.47)
Vividness		3.60 (1.49)	3.58 (1.63)	4.45 (1.68)	3.53 (1.59)
Temporality	Present	39 (51%)	42 (43%)	35 (66%)	46 (53%)
	Past	13 (17%)	13 (13%)	9 (17%)	11 (13%)
	Future	6 (8%)	17 (18%)	5 (9%)	16 (18%)
	Atemporal	19 (25%)	25 (26%)	4 (8%)	14 (16%)
Meta-	Yes	44 (57%)	46 (47%)	35 (66%)	52 (60%)
awareness	No	33 (43%)	51 (53%)	76 (44%)	35 (40%)

For Current Concerns and Vividness, mean and standard deviations are presented. For Temporality and Meta-awareness, count and percentages are presented.


Experiment 1
Word Task
Number Task
Proportions
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
On-task
SDT
SIT
TRI
Thought type


Experiment 2
Deep encoding task
Shallow encoding task
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
On-task
SDT
SIT
TRI
Thought type