Supplementary data for "Mental control and attributions of blame"

This supplementary data file was prepared by Samuel Murray.

Study 1

Model fit statistics and model comparisons

In Study 1, we fitted four linear models for predicting judgments of blame. All measures were standardized. Model 1 contained only intercepts (Null model). Model 2 contained a term for Control. Model 3 contained terms for Control and Ease. Model 4 contained terms for Control, Ease, Vividness, Situational Familiarity, and trait Perspective-Taking. Model fit statistics are reported below:

Model 2: $F(1, 366) = 35.98$, $p < .001$, adjusted $R^2 = .09$
Model 3: $F(2, 365) = 46.23$, $p < .001$, adjusted $R^2 = .20$
Model 4: $F(5, 362) = 19.75$, $p < .001$, adjusted $R^2 = .20$

An analysis of variance indicated that Model 3 exhibited the best fit. Model 2 was a statistically significant improvement over the Null model, and Model 3 was a statistically significant improvement over Model 2, but there was no evidence that Model 4 was a statistically significant improvement over Model 3.

Model	Residual df	RSS	df	Sum of sq.	*F*	*p*
1	367	367				
2	366	334.15	1	32.85	41.24	< .001
3	365	292.82	1	41.33	51.89	< .001
4	362	288.33	3	4.49	1.88	.133

Study 2a

Model fit statistics and model comparisons

In Study 2a, we fitted five linear models for predicting judgments of control. Model one contained only intercepts (Null model). Model 2 contained terms for Condition, Model 3 contained terms for Condition and Focus, Model 4 contained terms for Condition, Focus, and first-personal Mental Control, and the fifth model contained terms for Condition, Focus, first-personal Mental Control, and trait Spontaneous Mind Wandering. Model fit statistics are reported below:

Model 2: $F(1, 102) = 12.01$, $p < .001$, adjusted $R^2 = .10$
Model 3: $F(2, 101) = 6.34$, $p < .001$, adjusted $R^2 = .09$
Model 4: $F(3, 100) = 6.82$, $p < .001$, adjusted $R^2 = .14$
Model 5: $F(4, 99) = 5.62$, $p < .001$, adjusted $R^2 = .15$

An analysis of variance indicated that Model 4 exhibited the best fit. Model 2 was a statistically significant improvement over the Null Model, but there was no evidence that Model 3 was a statistically significant improvement over Model 2. However, Model 4 was a statistically significant improvement over Model 3 and there was no evidence that Model 5 was a statistically

significant improvement over Model 4. We then compared Model 2 and Model 4 directly, with the latter being a statistically significant improvement over the former ($F(2, 100) = 3.88$, Sum of Squares = 22.00, $p = .02$).

Model	Residual df	RSS	df	Sum of sq.	*F*	*p*
1	103	341.38				
2	102	305.41	1	35.97	12.80	< .001
3	101	303.32	1	2.09	0.74	.390
4	100	283.41	1	19.91	7.09	.009
5	99	278.17	1	5.23	1.86	.175

We also fitted five linear models for predicting judgments of blame. Model 1 contained only intercepts (Null Model). Model 2 contained a term for Condition, Model 3 contained terms for Condition and Focus, Model 4 contained terms for Condition, Focus, and Mental Control, and Model 5 contained terms for Condition, Focus, Mental Control, and trait Spontaneous Mind Wandering. Model fit statistics are reported below:

Model 2: $F(1, 102) = 19.15$, $p < .001$, adjusted $R^2 = 0.15$
Model 3: $F(2, 101) = 10.2$, $p < .001$, adjusted $R^2 = 0.15$
Model 4: $F(3, 100) = 7.47$, $p < .001$, adjusted $R^2 = 0.16$
Model 5: $F(4, 99) = 6.03$, $p < .001$, adjusted $R^2 = 0.16$

An analysis of variance indicated that Model 2 exhibited the best fit. Model 2 was a statistically significant improvement over Model 1, but there was no evidence that Models 3, 4, and 5 were statistically significant improvements over Model 2 (F (1, 102) = 19.46, Sum of Squares = 38.02, $p < .001$).

Model	Residual df	RSS	df	Sum of sq.	*F*	*p*
1	103	240.53				
2	102	202.51	1	38.02	19.46	< .001
3	101	200.11	1	2.40	1.23	.270
4	100	196.49	1	3.63	1.86	.176
5	99	193.38	1	3.11	1.59	.210

Study 2b

Model fit statistics and model comparisons

In Study 2b, we fitted five linear models for predicting judgments of control. Model one contained only intercepts (Null model). Model 2 contained terms for Condition, Model 3 contained terms for Condition and Focus, Model 4 contained terms for Condition, Focus, and first-personal Mental Control, and the fifth model contained terms for Condition, Focus, first-personal Mental Control, and trait Spontaneous Mind Wandering. Model fit statistics are reported below:

Model 2: $F(1, 116) = 24.19$, $p < .001$, adjusted $R^2 = .17$
Model 3: $F(2, 115) = 13.89$, $p < .001$, adjusted $R^2 = .18$

Model 4: $F(3, 114) = 13.35$, $p < .001$, adjusted $R^2 = .24$
Model 5: $F(4, 113) = 5.62$, $p < .001$, adjusted $R^2 = .24$

An analysis of variance indicated that Model 4 exhibited the best fit. Model 2 was a statistically significant improvement over the Null Model, but there was no evidence that Model 3 was a statistically significant improvement over Model 2. However, Model 4 was a statistically significant improvement over Model 3 and there was no evidence that Model 5 was a statistically significant improvement over Model 4. We then compared Model 2 and Model 4 directly, with the latter being a statistically significant improvement over the former ($F(2, 114) = 6.73$, Sum of Squares = 34.16, $p = .002$).

Model	Residual df	RSS	df	Sum of sq.	*F*	*p*
1	117	390.75				
2	116	323.32	1	67.43	26.59	< .001
3	115	314.74	1	8.59	3.39	.068
4	114	289.17	1	25.57	10.09	.002
5	113	286.55	1	2.62	1.03	.312

We also fitted five linear models for predicting judgments of blame. Model 1 contained only intercepts (Null Model). Model 2 contained a term for Condition, Model 3 contained terms for Condition and Focus, Model 4 contained terms for Condition, Focus, and Mental Control, and Model 5 contained terms for Condition, Focus, Mental Control, and trait Spontaneous Mind Wandering. Model fit statistics are reported below:

Model 2: $F(1, 116) = 8.52$, $p = .004$, adjusted $R^2 = 0.06$
Model 3: $F(2, 115) = 8.82$, $p < .001$, adjusted $R^2 = 0.12$
Model 4: $F(3, 114) = 8.35$, $p < .001$, adjusted $R^2 = 0.16$
Model 5: $F(4, 113) = 6.29$, $p < .001$, adjusted $R^2 = 0.15$

An analysis of variance indicated that Model 4 exhibited the best fit. Model 2 was a statistically significant improvement over Model 1, Model 3 was a statistically significant improvement over Model 2, and Model 4 was a statistically significant improvement over Model 3, but there was no evidence that Model 5 was a statistically significant improvement over Model 4 ($F(1, 114) = 6.52$, Sum of Squares = 12.68, $p < .012$).

Model	Residual df	RSS	df	Sum of sq.	*F*	*p*
1	117	268.65				
2	116	250.27	1	17.35	9.45	.003
3	115	232.92	1	17.35	8.92	.003
4	114	220.24	1	12.68	6.52	.012
5	113	219.73	1	0.51	0.26	.610

Study 3

Content analysis of autobiographical memory reports

To better understand differences in the memories reported by participants with the autobiographical memory manipulation, we conducted exploratory linguistic analyses using the

tm and *qdap* packages in R. All memory reports were extracted. Each entry was separated into distinct tokens. All stop words stored in the *tm* dictionary were removed (e.g., words such as 'the', 'an', 'this', etc.). All blank entries were also removed.

Participants produced roughly similar numbers of terms across conditions: **Success salience** = 1491 terms, **Failure salience** = 1439 terms, **Control** = 1789 terms. A word frequency matrix revealed a high degree of similarity between the kinds of terms used in the Success salience and Failure salience conditions ($r = 0.90$), and low correlations between the failure salience and control ($r = 0.17$) and success salience and control ($r = 0.10$) conditions. This suggests that the control condition elicited different kinds of narratives from the other two conditions, while the failure and success salience conditions activated similar kinds of narratives. We also conducted a sentiment analysis using the polarity function in R's *qdap* package (Rinker, 2013). This analysis showed that participants in each condition reported memories that were exhibited neither positive nor negative affect (**Success salience** polarity = -0.004, *SD* = 0.27; **Failure salience** polarity = -0.06, *SD* = 0.29; **Control** polarity = 0.004, *SD* = 0.28), with the failure salience condition eliciting slightly more negative affect (see Figure S1).

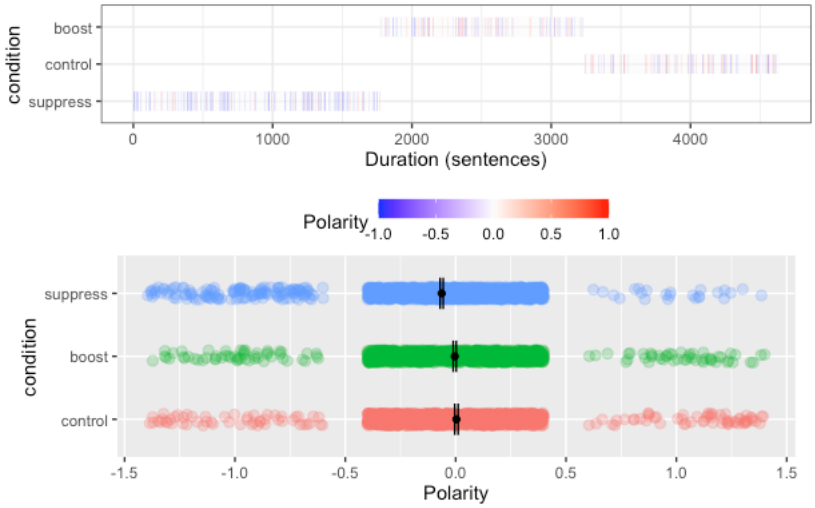

Figure S1. Plot of sentiment analysis using the polarity function in the *qdap* package in R (Rinker, 2013). The top panel plots the polarity of each sentence (this is uninformative for the dataset, as we analyzed individual tokens rather than sentences). The bottom panel plots the polarity of each term across condition. Error bars represent standard errors.

While these results are exploratory, they suggest that the three conditions did not differ significantly in the valence of the content produced in the open responses. Thus, the condition-level effects on first-personal assessments of mental control and third-personal judgments of blame do not seem to be explained by differences in the valence associated with the conditions.