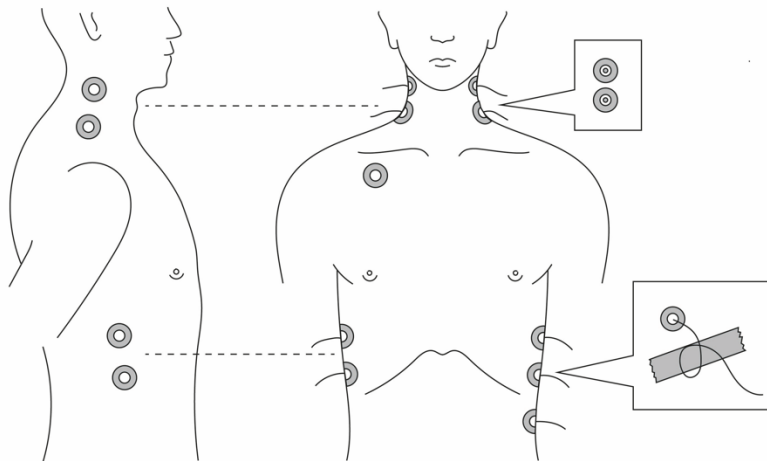


## Supplement

### Non-Focal Measures

We assessed self-reported mental fatigue at the beginning of the study and after the manipulation of mental demand. Final questions assessed morningness/eveningness, demographic information, self-rated data quality, strategies used during the Stroop task, experience with the Stroop task, presumed study purpose, visual impairment, and subjective perceptions of the psychophysiological measurement. The full list of items and their English translations can be found in the associated OSF project (<https://tinyurl.com/uh6ojqk>).

### Electrode Placement



*Figure 1.* Spot electrode placement with voltage electrodes located at the base of the neck and at the level of the lower end of the sternum. Current electrodes were placed at a distance of 3cm from the respective voltage electrodes. ECG electrodes were placed below the right collarbone and on the lowest left rib. For optimal quality, the leads were put in loops and fastened with adhesive tape.

### Pre-Registered Exploratory Analyses

**Lay theories about willpower.** The effect of mental demand on Stroop interference (errors) was not moderated by participants' lay theories about willpower ( $\alpha = 0.86$ ; see Table 1).

Table 1

*Lay theories about willpower: Moderation of the effect of mental demand on Stroop interference (errors)*

	<i>b</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Mental demand	0.50	1.17	0.43	.667
Lay theories about willpower (exhaustion)	0.54	0.78	0.70	.487
Mental demand $\times$ Lay theories	0.39	1.18	0.33	.744

*Note.*  $N = 174$ .  $R^2 = .01$ . Continuous predictors are mean-centered and scaled by 1 *SD*.

**Trait self-control.** The effect of mental demand on Stroop interference (errors) was not moderated by participants' trait self-control ( $\alpha = 0.85$ ; see Table 2).

Table 2

*Trait self-control: Moderation of the effect of mental demand on Stroop interference (errors)*

	<i>b</i>	<i>SE B</i>	<i>t</i>	<i>p</i>
Mental demand	0.50	1.15	0.43	.667
Trait self-control	-0.94	0.88	-1.07	.286
Mental demand $\times$ Trait self-control	-0.72	1.17	-0.62	.535

*Note.*  $N = 174$ .  $R^2 = .03$ . Continuous predictors are mean-centered and scaled by 1 *SD*.

**SBP reactivity: Outlier-cutoff 3 MADs.** As expected, participants showed no difference in SBP during the baseline ( $2 \times 2$  ANOVA with mental demand  $\times$  self-affirmation: all  $ps > .130$ ). Also, as expected, participants in the high compared to the low demands conditions exerted more mental effort during the manipulation of mental demand—difficult versus easy counting task—as indicated by higher SBP relative to the baseline ( $t[160.03] = -4.78, p < .001, d = -0.73, 95\%CI [-\infty, -0.47]$ ). This speaks to the strength of our manipulation in terms of required mental effort and suggests that the SBP measurement was successful in picking up participants' increased effort in the high as compared to the low demand conditions.

During the self-affirmation manipulation, the four experimental conditions did not differ in invested mental effort (*mental demand*  $\times$  *self-affirmation* ANOVA: all  $ps > .118$ ). Also, there were no differences between conditions as indicated by SBP reactivity during the Stroop task—neither as a function of mental demand, nor as a function of self-affirmation or their interaction (all  $ps > .259$ ; for descriptive statistics see Table 4).

Table 4

*Systolic blood pressure with outlier cutoff 3.0 MADs**1) Systolic blood pressure (SBP) in mmHg*

		Self-affirmation		Overall
		No	Yes	
Mental demand	High	113.82 (10.13) N = 43	110.74 (7.56) N = 45	112.25 (8.99)
	Low	110.84 (8.74) N = 46	111.96 (10.27) N = 45	111.40 (9.49)
	Overall	112.28 (9.50)	111.35 (8.99)	
<i>B) SBP Reactivity: Manipulation of mental demand.</i>				
Mental demand	High	6.54 (5.27) N = 86		
	Low	3.13 (4.07) N = 88		
<i>C) SPB Reactivity: Self-affirmation manipulation.</i>				
		Self-affirmation		Overall
		No	Yes	
Mental demand	High	6.50 (6.95) N = 43	6.35 (4.23) N = 45	6.42 (5.69)
	Low	3.96 (5.76) N = 44	6.24 (4.88) N = 43	5.09 (5.44)
	Overall	5.21 (6.47)	6.29 (4.53)	
<i>D) SBP Reactivity: Stroop task.</i>				
		Self-affirmation		Overall
		No	Yes	
Mental demand	High	6.78 (5.99) N = 43	5.27 (5.32) N = 44	6.02 (5.68)
	Low	5.74 (7.01) N = 46	6.22 (4.91) N = 45	5.98 (6.04)
	Overall	6.24 (6.52)	5.75 (5.11)	

*Note. M (SD).*

### **Additional Exploratory Analyses**

**Self-reported mental fatigue.** Current mental fatigue was assessed with three items of the German version of the State Self-Control Capacity Scale (SSCCS; items 1, 12, & 15; Bertrams & Dickhäuser, 2009) and two additional items (“I feel mentally drained”, “I feel mentally efficient”) rated on a 7-point-scale (1 = *strongly disagree* to 7 = *strongly agree*). Current mental fatigue was assessed both at the beginning of the study and after the manipulation of mental demand (mean of 5 items;  $\alpha = .89, .87$ ).

There were no significant differences concerning self-reported mental fatigue between the conditions neither at the beginning of the study (as a function of mental demand and/or self-affirmation, for inference statistics see Table 1) nor after the manipulation of mental demand (as a function of mental demand:  $t[175.78] = 0.16, p = .876, d = 0.02, 95\%CI [-\infty, 0.32]$ ). For descriptive statistics see Table 1.

***Fatigue baseline and Stroop performance / SBP reactivity Stroop task.*** Only for the condition *high demand+non-affirmed*, there was a significant correlation of fatigue at the beginning with Stroop performance (see Figure 2). There was no other significant correlation, neither for the other conditions (see Figure 2) nor for fatigue after the mental demand manipulation and Stroop performance (see Figure 3).

Including self-reported mental fatigue at the beginning of the study for the *non-affirmed* conditions did not change the conclusions for the Stroop task or for SBP reactivity during the Stroop task (see Table 2).

Table 1

Self-reported mental fatigue (mean of 5 items)

A) At the beginning of the study.			
A.1) Descriptive statistics			
		Self-affirmation	
		No	Yes
Mental demand	Low	3.38 (1.29)	3.06 (1.15)
	High	3.24 (1.21)	3.26 (1.12)
A.2) Inference statistics			
	<i>F</i> (1,175)	<i>p</i>	$\eta_p^2$
Mental demand	0.51	.559	.002
Self-affirmation	0.09	.802	<.001
MD × S-A	0.39	.611	.001
B) After the manipulation of mental demand.			
Mental demand	Low	3.25 (1.16)	
	High	3.22 (1.22)	

Note. *M* (*SD*).

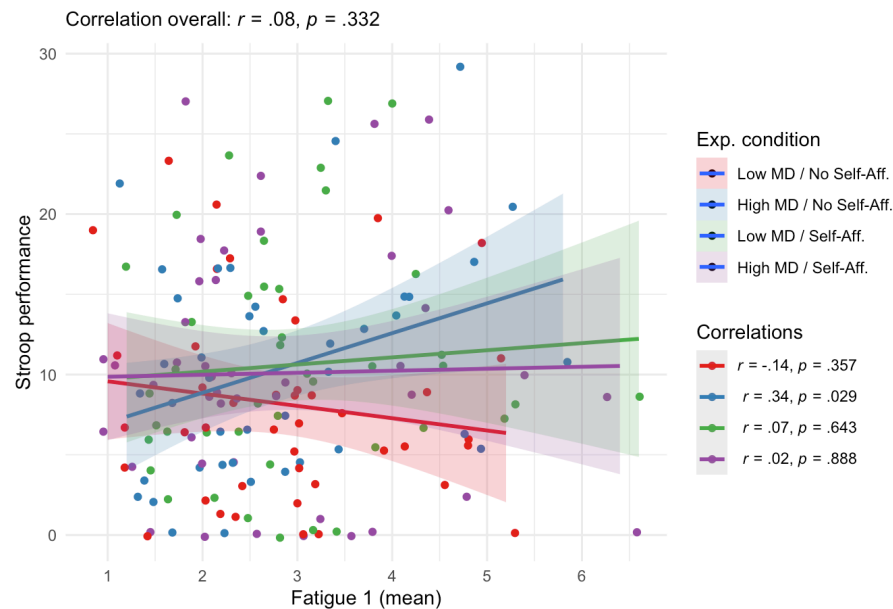


Figure 2. Correlations for Stroop performance and self-reported fatigue at the beginning of the study.

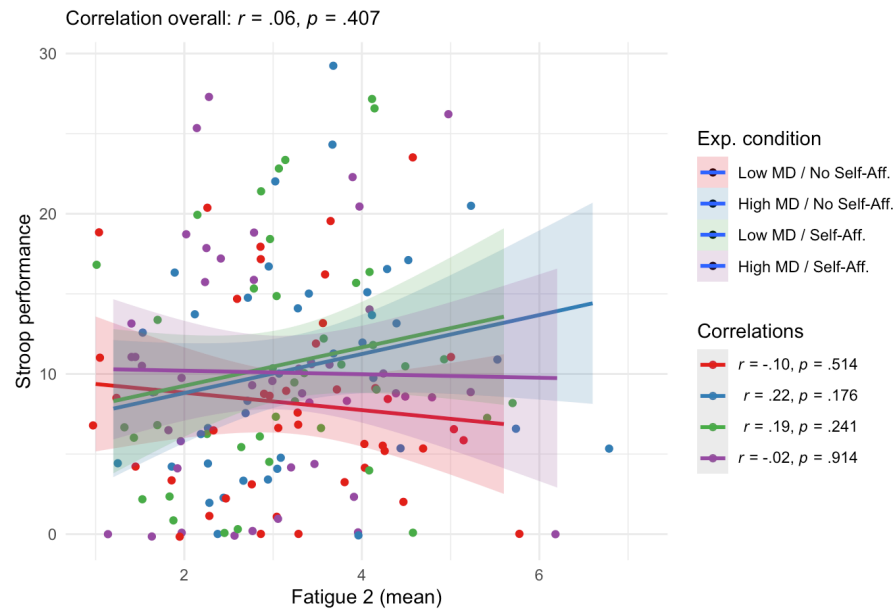


Figure 3. Correlations for Stroop performance and self-reported fatigue after the manipulation of mental demand.

Table 2

*Linear regressions including self-reported mental fatigue baseline as covariate*

<i>A) Stroop performance</i>				
	<i>Estimate</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Mental demand	-2.26	1.40	-1.16	.111
Self-affirmation	0.60	0.60	1.01	.317
<i>B) SBP reactivity Stroop task</i>				
	<i>Estimate</i>	<i>SE</i>	<i>t</i>	<i>p</i>
Mental demand	-1.03	1.37	-0.75	.454
Self-affirmation	-1.02	0.58	-1.77	.080

**Morningness/eveningness.** We exploratorily assessed morningness versus eveningness using the last item of the D-MEQ (D-MEQ; item 19; Griefahn, Künemund, Bröde, & Mehnert, 2001). Higher values stand for “eveningness”, lower values for “morningness” (see Table 3). There was no significant relationship between morningness/eveningness ratings and Stroop performance (see Figure 4).

Table 3

*Morningness/Eveningness*

		Self-affirmation	
		No	Yes
Mental demand	Low	2.59 (0.93) <i>N</i> = 46	2.93 (0.84) <i>N</i> = 45
	High	2.74 (0.82) <i>N</i> = 43	2.73 (0.94) <i>N</i> = 45

*Note. M (SD).*



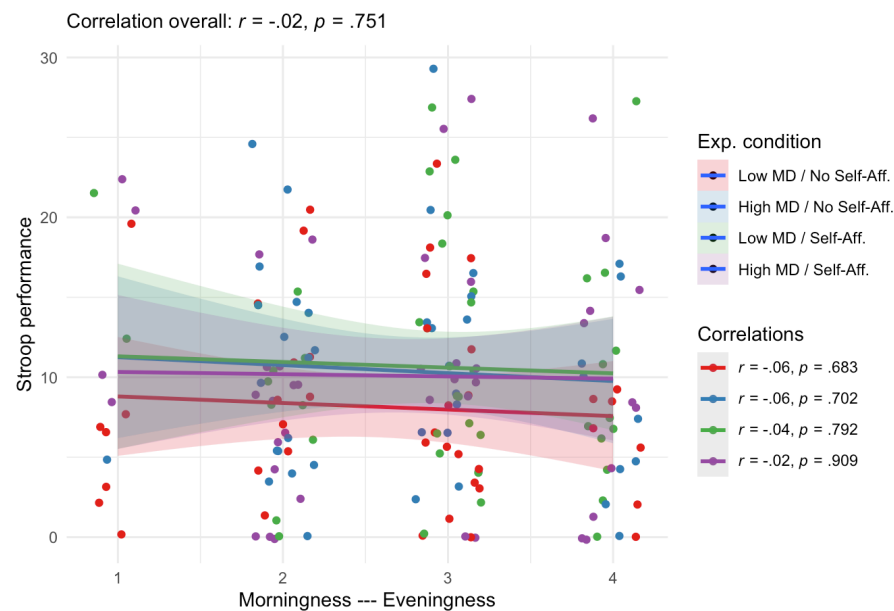


Figure 4. Correlations for morningness/eveningness and Stroop performance.

**Relationship SBP reactivity and Stroop interference.** There was no significant correlation for SBP reactivity (during the Stroop task, relative to the baseline) and Stroop performance (see Figure 5).

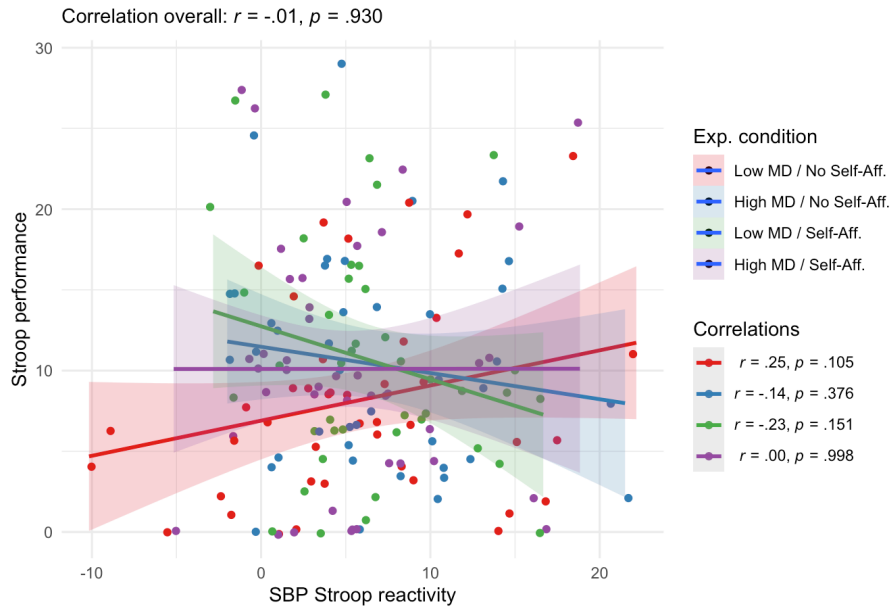


Figure 5. Correlations for SBP reactivity (during the Stroop task, relative to the baseline) and Stroop performance.

### Bayesian model comparisons SBP reactivity Stroop task (non-affirmed conditions).

The strength model assuming no difference in invested mental effort for the non-affirmed conditions as a function of mental demand was superior to both the process model (low demand < high demand) and a third alternative (low demand > high demand, see Table 4).

Table 4

*Bayesian model comparisons for SBP reactivity in the Stroop task (non-affirmed conditions)*

	Strength model (low demand = high demand) over ...	Process model (low demand > high demand) over ...
Process model (low demand > high demand)	BF = 4.58	
Alternative (low demand < high demand)	BF = 15.73	BF = 3.43

**Stroop interference based on reaction times.** Participants in *the non-affirmed* conditions did not perform worse after exerting self-control than after not exerting self-control ( $t_{\text{one-sided}}[75.16] = -1.12, p = .133, d = -0.25, 95\% \text{ CI } [-0.68, 0.19]$ ; for descriptive statistics, see Table 3). Self-affirmation did not counteract the detrimental effect of the ego depletion manipulation (pre-registered contrast: *high demands/non-affirmed* = +3, remaining three conditions = -1). The pre-registered contrast thus did not fit the data ( $F[1, 166] = 0.17, p = .682, f = 0.03$ ).

Table 5

*Stroop interference on reaction times (outlier cutoff 2.5 SDs from condition means; reaction time [ms] on incongruent trials minus reaction time [ms] on congruent trials)*

		Self-affirmation		Overall
		No	Yes	
Mental demand	High	194.15 (62.62) <i>N</i> = 41	220.16 (65.43) <i>N</i> = 42	207.31 (65.00)
	Low	180.46 (48.25) <i>N</i> = 43	195.77 (61.33) <i>N</i> = 42	188.02 (55.31)
	Overall	187.14 (55.81)	207.96 (64.21)	

*Note.* *M* (*SD*).

**Wordcount of essays.** We exploratorily counted the number of words written during the self-affirmation manipulation. Participants in the *self-affirmed* conditions wrote more words ( $M = 101.08$ ,  $SD = 24.98$ ) than participants in the *non-affirmed* conditions ( $M = 90.15$ ,  $SD = 21.78$ ;  $t[174.28] = 3.12$ ,  $p = .002$ ,  $d = 0.47$ , 95%CI [0.17, 0.77]). SBP reactivity did not relate to the number of written words (see Figure 6).

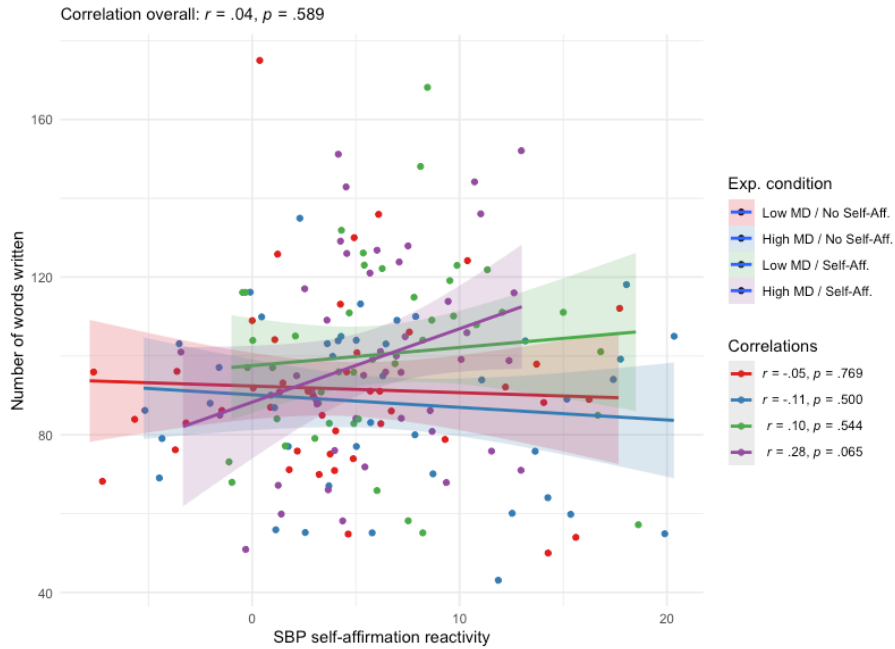


Figure 6. Correlations for SBP reactivity (during the self-affirmation manipulation, relative to the baseline) and wordcount.

**Abstractness of essays.** We exploratorily calculated abstractness scores for the most used words in the essays written during the self-affirmation manipulation based on a data base of 40,000 words by Brysbaert, Warriner, and Kuperman (2014). German stopwords were excluded. Participants in the *self-affirmed* conditions used more abstract words ( $M = 3.36$ ,  $SD = 0.97$ ) than participants in the *non-affirmed* conditions ( $M = 2.29$ ,  $SD = 0.86$ ;  $t[57.16] = 4.53$ ,  $p < .001$ ,  $d = 1.17$ , 95%CI [0.61, 1.73]; see Figure 7). The results were similar for the 20 ( $t[57.16] = 4.53$ ,  $p < .001$ ,  $d = 1.17$ , 95%CI [0.61, 1.73]) or 10 ( $t[57.16] = 4.53$ ,  $p < .001$ ,  $d = 1.17$ , 95%CI [0.61, 1.73]) most used words, respectively.

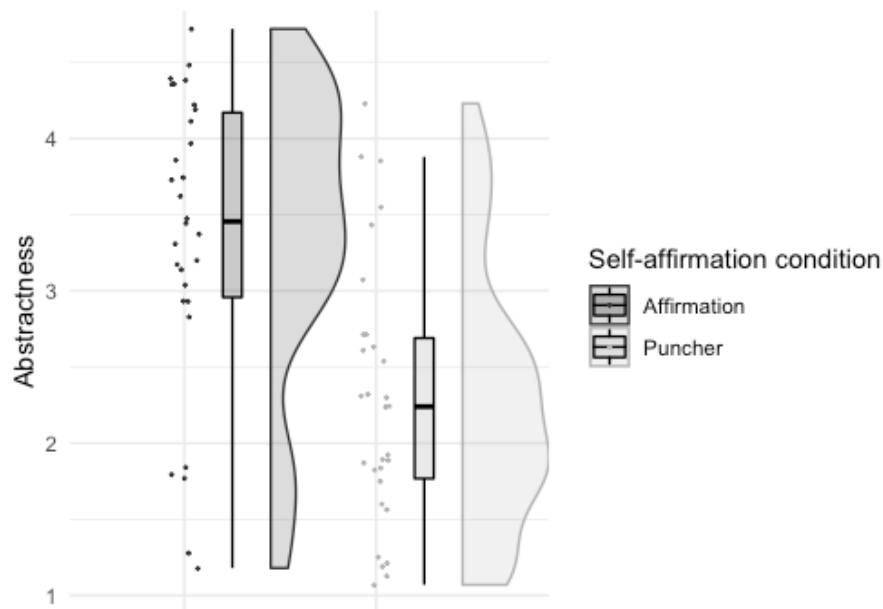


Figure 7. Abstractness scores of 30 most used words by self-affirmation condition written during the self-affirmation manipulation. Abstractness scores based on a database by Brysbaert et al. (2014).

**Stroop questions.** We asked five questions after the Stroop task. There were no significant differences between the groups for any of the questions (see Table 6).

Table 6

*Stroop questions*

<i>1) How motivated were you to work on the color task according to the instructions?</i>			
<i>1.1) Descriptive statistics</i>			
		Self-affirmation	
		No	Yes
Mental demand	Low	6.48 (0.72)	6.53 (0.69)
	High	6.49 (1.01)	6.73 (0.54)
<i>1.2) Inference statistics</i>			
	$F(1,175)$	$p$	$\eta_p^2$
Mental demand	0.87	.352	.005
Self-affirmation	1.76	.186	.010
MD $\times$ S-A	0.70	.403	.004
<i>2) How much effort did you put into working on the color task according to the instructions?</i>			
<i>2.1) Descriptive statistics</i>			
		Self-affirmation	
		No	Yes
Mental demand	Low	6.62 (0.57)	6.67 (0.56)
	High	6.58 (0.73)	6.84 (0.37)
<i>2.2) Inference statistics</i>			
	$F(1,175)$	$p$	$\eta_p^2$
Mental demand	0.58	.447	.003
Self-affirmation	3.04	.083	.017
MD $\times$ S-A	1.76	.186	.010

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3) *How difficult was it for you to work on the color task according to the instructions?*


---

3.1) *Descriptive statistics*

		Self-affirmation	
		No	Yes
Mental demand	Low	4.02 (1.56)	4.11 (1.35)
	High	3.77 (1.77)	3.80 (1.77)

3.2) *Inference statistics*

	$F(1,175)$	$p$	$\eta_p^2$
Mental demand	1.37	.244	.008
Self-affirmation	0.06	.815	< .001
MD $\times$ S-A	0.01	.907	< .001

---

4) *How much did you want to work on the color task according to the instructions?*


---

4.1) *Descriptive statistics*

		Self-affirmation	
		No	Yes
Mental demand	Low	5.35 (1.45)	5.38 (1.61)
	High	5.53 (1.58)	5.67 (1.54)

4.2) *Inference statistics*

	$F(1,175)$	$p$	$\eta_p^2$
Mental demand	1.06	.304	.006
Self-affirmation	0.13	.716	.001
MD $\times$ S-A	0.05	.826	<.001

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5) *How exhausting did you find it to work on the color task according to the instructions?*


---

5.1) *Descriptive statistics*

		Self-affirmation	
		No	Yes
Mental demand	Low	4.59 (1.56)	4.69 (1.56)
	High	4.28 (1.61)	4.11 (1.63)

5.2) *Inference statistics*

	$F(1,175)$	$p$	$\eta_p^2$
Mental demand	3.49	.064	.020
Self-affirmation	0.03	.872	< .001
MD $\times$ S-A	0.32	.571	.002

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*Note.*  $M$  ( $SD$ ).

**Bayesian model comparisons SBP baseline.** We explored if participants already differed during the SBP baseline as a function of mental demand condition. The model assuming no differences between the group provided a better fit than the model assuming higher / lower SBP during the baseline for the high demand conditions ( $BF = 4.38$  /  $BF = 11.86$ ).