Supplementary Material

A Systematic Review of Volitional Personality Change Research

ReadMe

This document includes an overview of all analyses conducted for the manuscript "*A Systematic Review of Volitional Personality Change*".

HTML-Version
We strongly recommend looking at the (interactive) HTML-version of this document instead of this PDF, which we could not upload together with the manuscript due to the journal formatting requirements. The HTML-version (including all R code used to conduct the analyses) can be retrieved from: https://osf.io/tw358/

Preregistration
The review has been preregistered at https://osf.io/ns79m/. Deviations from this preregistration are described in the manuscript and summarized in the following table.

Supplementary Table 1: Deviations from the Preregistration

Preregistered Plan	Deviation	Reason
We preregistered to account for dependency of effect sizes based on different assessments belonging to the same sample with an auto-correlation of phi = 0.608 (Bleidorn et al., 2022) and based on different subsamples or interventions within a study that are correlated with rho = 0.225 (Van Der Linden et al., 2010)	We accounted for different traits targeted in the same sample correlated with rho = 0.548 (Connolly et al., 2007) and for different subsamples within the same study correlated with rho = 0.225 (Van Der Linden et al., 2010).	After extracting all effect sizes, we realized that the way of dependencies in our meta-analytic dataset differed from what we expected so that the revised procedure should represent more accurate working assumptions
We preregistered to screen the reference list of two review articles on VPC.	We additionally screened the reference list of all eligible articles which resulted in one paper that we included in our review.	Additionally screening the reference lists of eligible studies was requested in the review process of our manuscript. The literature made our literature search more comprehensive.
We preregistered to double-code the data extraction of 25% of all eligible studies.	Data extraction of all studies was done by two independent reviewers.	The extended double coding was requested in the review process of our manuscript. This procedure increased the certainty of our codings.
We preregistered to examine pre-post changes in intervention-induced VPC.	We additionally examined changes pre-follow-up changes in intervention-induced VPC.	There were sufficient studies with follow-up interval to examine follow-up effects of VPC.

ShinyApp
This review comes with a ShinyApp illustrating the results of the systematic review: https://life-event-research.shinyapps.io/VolitionalChange. This ShinyApp can be used to filter, sort, reduce, and expand the results of the review according to one's personal interests. Furthermore, the ShinyApp provides more details

of the study characteristics of the included studies.

Supplementary Note 1: Descriptive Statistics

Supplementary Table 2: Descriptive Statistics of Metric Study and Sample Characteristics

	Mean	SD	Min	Max
Publication year	2020.37	2.75	2014.00	2024.00
Mean age	25.57	7.88	19.03	42.18
Percentage of female participants	67.69	11.27	44.00	85.00
Study duration (in weeks)	31.77	36.82	4.00	178.00
Number of personality assessments	7.35	6.38	2.00	16.00
Number of change goal assessments	1.58	0.86	1.00	4.00

Note. This table provides an overview of the descriptive statistics of all studies included in the review. In the calculation of the descriptive statistics, we did not consider the mega-analysis by Hudson et al. (2020a) and the study by Hudson et al. (2020b) that integrated different samples because these studies overlapped with other studies included in the review.

Supplementary Note 2: Meta-Analysis of Intervention Studies

Pre-Post Intervention Effect

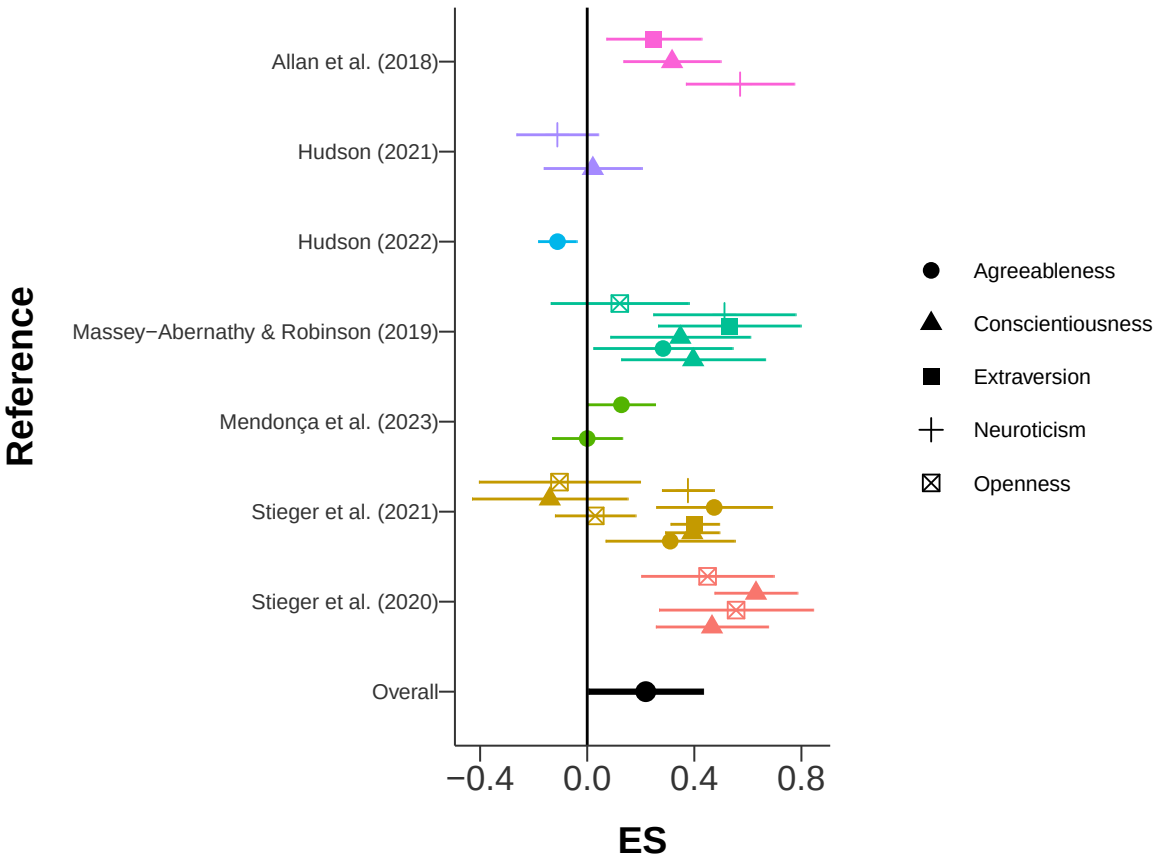
Supplementary Table 3: Effect of volitional change interventions (Pre-Post)

	k	*b*	*SE*	*t*	*df*	*p*	Lower CI	Upper CI
Across traits	26	0.219	0.087	2.507	5.940	0.046	0.005	0.433
Agreeableness	6	0.146	0.117	1.252	2.955	0.300	-0.229	0.521
Conscientiousness	8	0.310	0.092	3.370	3.798	0.030	0.049	0.571
Extraversion	3	0.379	0.055	6.877	1.611	0.035	0.078	0.680
Neuroticism	4	0.330	0.157	2.102	2.988	0.127	-0.171	0.830
Openness	5	0.205	0.156	1.315	1.989	0.320	-0.469	0.879

Note. This table provides an overview of the meta-analytic results for pre-post intervention effects while accounting for the dependency of effect sizes. k refers to the number of available effect sizes.

Forest Plot

Figure S1: Forst Plot Illustrating Effect Sizes of Intervention-Induced VPC.



Note. This figure illustrates effect sizes of intervention-induced VPC in different studies. Effect sizes are color-coded according to the seven studies that were included in our meta-analysis. Different personality traits are coded with different shapes of the point estimates. Error bars indicate 95% confidence intervals.

Exploratory: Pre-FollowUp Intervention Effect

Supplementary Table 4: Effect of volitional change interventions (Pre-FollowUp)

	k	*b*	*SE*	*t*	*df*	*p*	Lower CI	Upper CI
Pre-Follow-Up	17	0.365	0.061	5.965	2.398	0.017	0.14	0.591

Note. The table provides an overview on the meta-analytic results on personality trait changes from pre-intervention assessments to follow-up assessments, while accounting for the dependency of effect sizes.

We also explored whether the larger effect size for the pre-follow-up meta-analysis compared to the pre-post meta-analysis could be explained by differences in studies contributing effect sizes to these meta-analyses.

Supplementary Table 5: Effect of volitional change interventions (Pre-Post, revised)

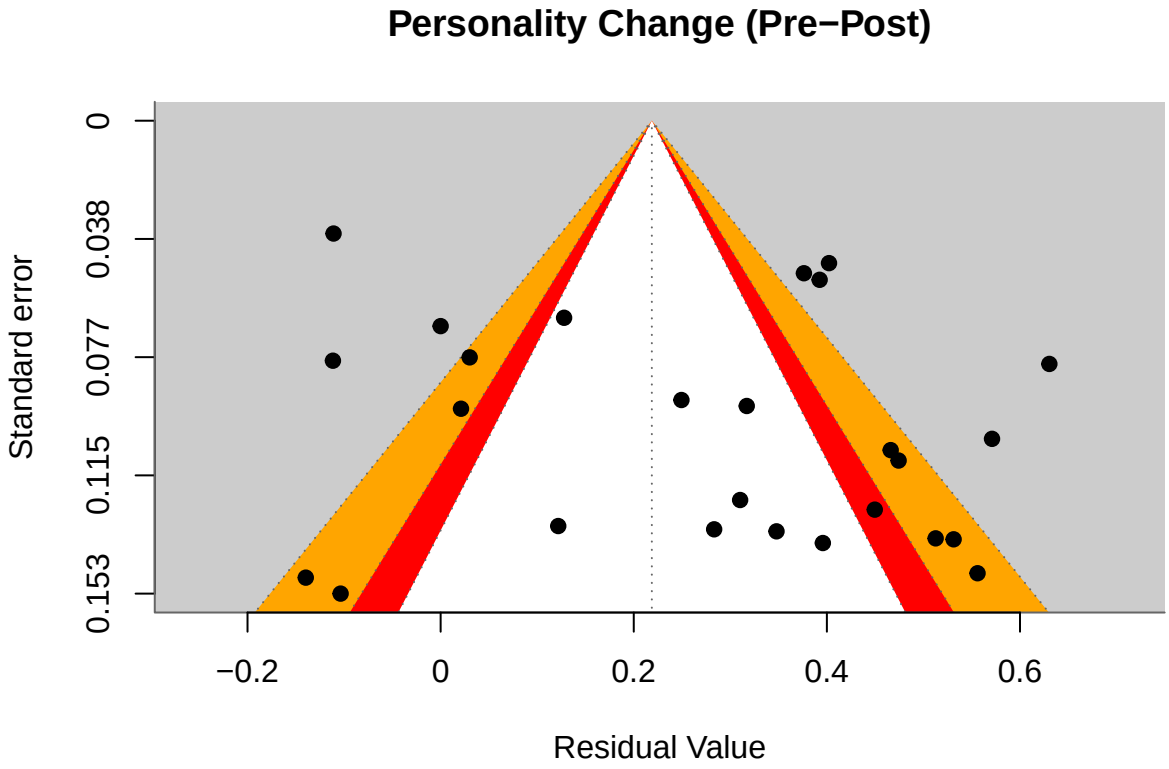
	k	*b*	*SE*	*t*	*df*	*p*	Lower CI	Upper CI
Pre-Follow-Up	17	0.31	0.092	3.352	2.958	0.045	0.013	0.606

Note. This table summarizes the results on the meta-analytic models on pre-post intervention effects when restricting the pre-post meta-analysis to studies that had a follow-up assessment. As can be seen, effect sizes estimate increased, suggesting that the larger effect size as follow-up is at least partly driven by differences in the contributing studies.

Supplementary Note 3: Publication Bias

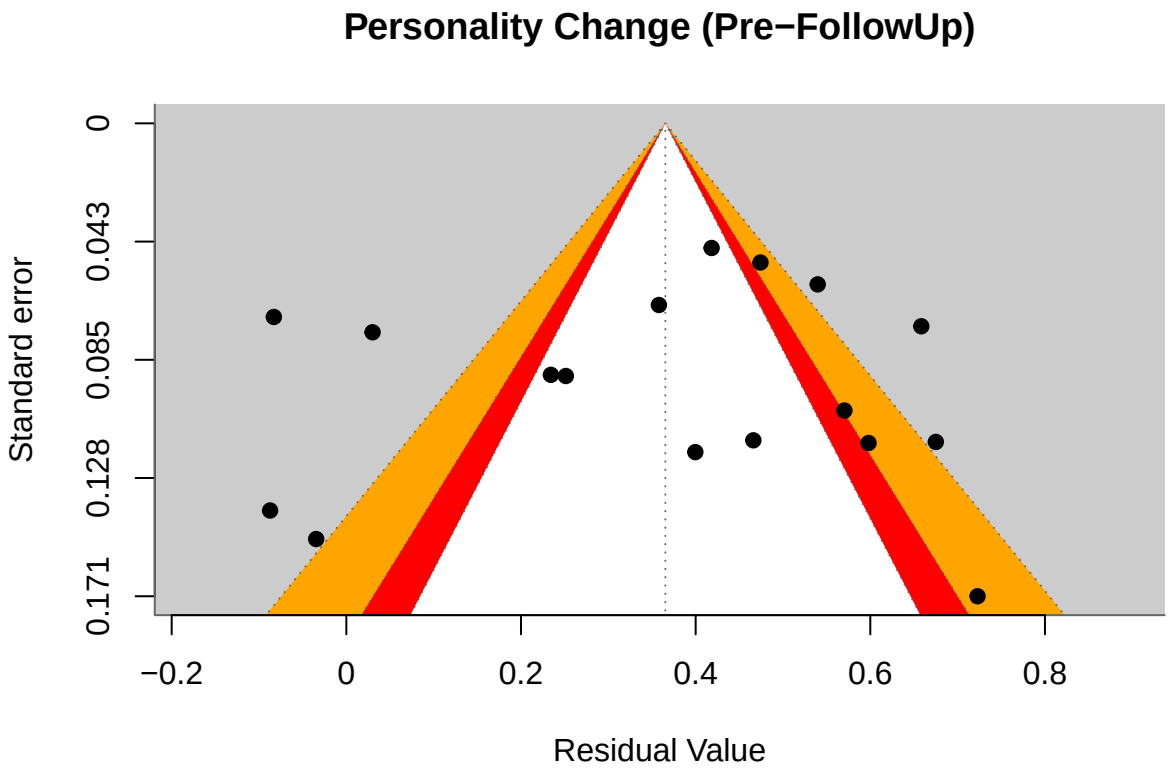
Funnel Plots

Figure S2: Funnel Plot of Pre-Post Meta-Analysis.



Note. The plot illustrates the distribution of effect sizes according to their standard error and residual value. The white, red, and orange Supplementary Notes describe 90%, 95%, and 99% confidence intervals around the estimated effect size.

Figure S3: Funnel Plot of Pre-Follow-Up Meta-Analysis.



Note. The plot illustrates the distribution of effect sizes according to their standard error and residual value. The white, red, and orange Supplementary Notes describe 90%, 95%, and 99% confidence intervals around the estimated effect size.

Regression Test

Supplementary Table 6: Supplementary Table 6: Regression test of publication bias

	b	*SE*	*p*
Pre-Post Intervention	-1.764	2.518	0.579
Pre-FollowUp Intervention	-0.235	3.084	0.949

Note. This table provides an overview on the results of Egger's Regression Test. A non-significant result indicates that the standard error of effect sizes is not systematically linked to the population effect size.

Supplementary Note 4: Overview of Employed Interventions

Note. This table summarizes the employed intervention strategies, targeted levels, targeted components, and intensity of VPC intervention. An intervention can employ multiple strategies, target multiple levels, and target multiple components.

Supplementary Note 5: Details on Effect Size Calculation for Figure 4

In Figure 4, we compared the effect sizes of normative personality changes, VPC without intervention, intervention-induced VPC, and personality changes in context of psychotherapy. The first two effect sizes were estimated based on publications by Bleidorn et al. (2022) and Hudson et al. (2020).

Supplementary Table 7: Overview of design of interventions

Variable	Number of effect sizes	Percentage of effect sizes
Intervention strategies		
Behavioral activation	13	68.42
Cognitive restructuring	6	31.58
Discrepancy awareness	16	84.21
Goal setting	18	94.74
Feedback	14	73.68
Mindfullness/Meditation	2	10.53
Motivated reflection	13	68.42
Physical activity	2	10.53
Positive reinforcement	10	52.63
Psychoeducation	19	100.00
Resource identification	8	42.11
Skill building: observation	7	36.84
Skill building: practice	10	52.63
Social support	9	47.37
Other	2	10.53
Trageted level		
Trait	19	100.00
Habit	18	94.74
State	18	94.74
Targeted components		
Affect	9	47.37
Behaviour	16	84.21
Cognition	19	100.00
Intensity		
Less than once per week	1	5.26
Once per week	9	47.37
More than once per week	9	47.37

To estimate normative personality changes over 3 months, we used the results presented in Table 7 of Bleidorn et al. (2022). This table summarizes findings on mean-level changes across different meta-analytic models. To determine the effect size of interest, we used the simplest model that accounted for the time lag between assessments, that is, Model 2. In this model, the intercept describes estimated normative personality changes for an average age (20.697 years) and an average time lag (4.228 years). As we were interested in normative personality changes over 3 months (0.25 years), we calculated our effect size of interest as follows:

```
round(0.072 + 0.008 * (0.25 - 4.228),2)
```

```
## [1] 0.04
```

To estimate VPC without interventions, we used the bottom half of Table 2 of Hudson et al. (2020). This table summarizes standardized changes in personality traits over 16 weeks. To obtain an estimate of VPC without intervention, we used the main effect for study (i.e., normative changes over 16 weeks) and the interactions between study and change goals (i.e., 1SD above the mean for people who desire to change). We then averaged findings across traits. Furthermore, as the study duration was 16 weeks, we multiplied the result with 13/16 to obtain the effect size over 3 months (i.e., 13 weeks):

```
round((0.142+0.075 + 0.053-0.015 + 0.092-0.062 + 0.181+0.234 + 0.039+0.116)/5 * 13/16,2)
```

```
## [1] 0.14
```