PNAS

www.pnas.org

Supplementary Information for

Changing Personality Traits with the Help of a Digital Personality Change Intervention

Mirjam Stieger[1]
Christoph Flückiger[2]
Dominik Rüegger[3]
Tobias Kowatsch[3,4]
Brent W. Roberts[5,6]
Mathias Allemand[2,7]

[1] Brandeis University, Department of Psychology, 415 South Street, Waltham, MA 02453, USA
[2] University of Zurich, Department of Psychology, Binzmühlestrasse 14, 8050 Zürich, Switzerland
[3] ETH Zurich, Center for Digital Health Interventions, Chair of Information Management, Weinbergstrasse 56/58, 8092 Zurich, Switzerland
[4] University of St. Gallen, Center for Digital Health Interventions, Institute of Technology Management, Dufourstrasse 40a, 9000 St. Gallen, Switzerland
[5] University of Illinois at Urbana-Champaign, Department of Psychology, 603 E. Daniel Street M/C 716, Champaign, IL 61820, USA
[6] University of Tübingen, *Hector* Research *Institute* of Education Sciences and Psychology, Europastrasse 6, 72072 Tübingen, Germany
[7] University of Zurich, URPP Dynamics of Healthy Aging, Andreasstrasse 15, 8050 Zurich, Switzerland

*Mirjam Stieger, Brandeis University, Department of Psychology, 415 South Street, Waltham, MA 02453, USA, Phone: 781-736-3284
*Mathias Allemand, University of Zurich, Department of Psychology and URPP Dynamics of Healthy Aging, Andreasstrasse 15, 8050 Zurich, Switzerland. Phone: 0041 44 635 34 12

**Email:** stieger@brandeis.edu, mathias.allemand@uzh.ch

This PDF file includes:

Supplementary Information Text

Appendix A. At the beginning of the intervention, participants were asked how motivated they are to stick to their selected change goal on a Likert-type scale from *totally disagree* (1) to *totally agree* (5) and they were also asked how strong they would rate their desire to change their personality from *not at all* (0) to *very strong* (7). On average, participants were highly motivated to stick to their goal ($M = 3.94$, $SD = 0.52$) and they also rated their desire to change as being strong ($M = 5.11$, $SD = 1.22$). Of the three possible trait assessments all participants could complete (Pretest 2, Posttest, and Follow-up assessment), a total of 404 (27%) participants provided data at all assessments, 181 (12%) at two assessments, and 939 (61%) at one assessment (mostly at Pretest 2). Attrition analyses revealed that conscientiousness at Pretest 2 ($r = 0.09$, $p < .01$) and neuroticism at Pretest 2 ($r = 0.06$, $p < .05$) significantly correlated with total number of completed assessments. We also compared personality traits at Pretest 2 of participants who completed one, two, or all three trait assessments. Overall, these comparisons suggest small differences between the three groups in terms of effect sizes. More specifically, participants who only completed one assessment had lower initial scores in agreeableness ($d = 0.17$) than participants who completed two assessments as well as lower scores in conscientiousness ($d = 0.22$) and neuroticism ($d = 0.15$) compared those who completed three assessments. Also, initially, participants who completed two assessments were more agreeable ($d = 0.23$), less conscientious ($d = 0.20$), and more neurotic ($d = 0.20$) than those who completed all three assessments. Other personality trait variables at Pretest 2 were not related to total number of completed assessments.
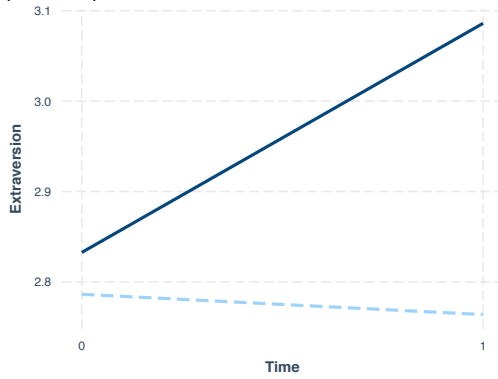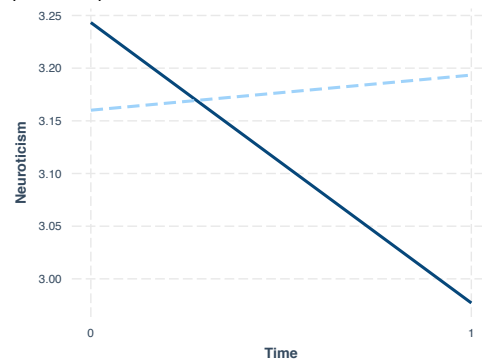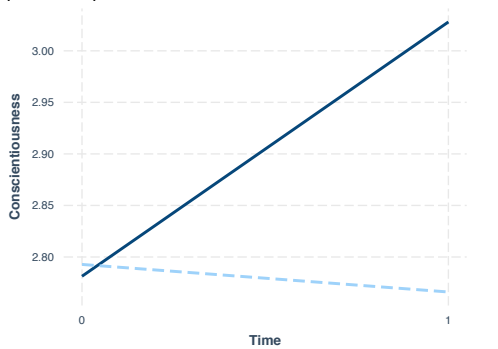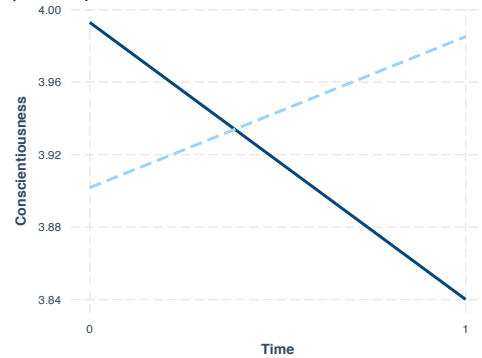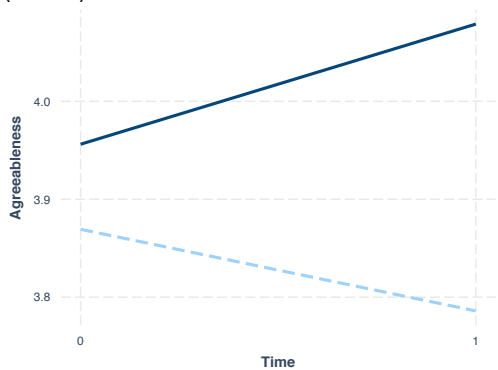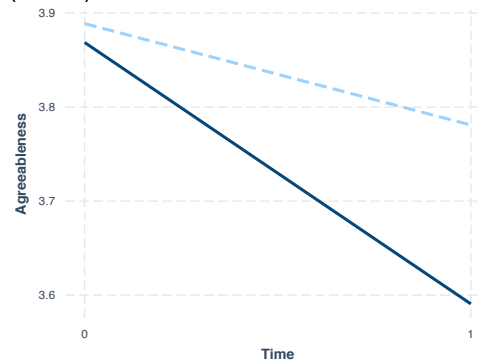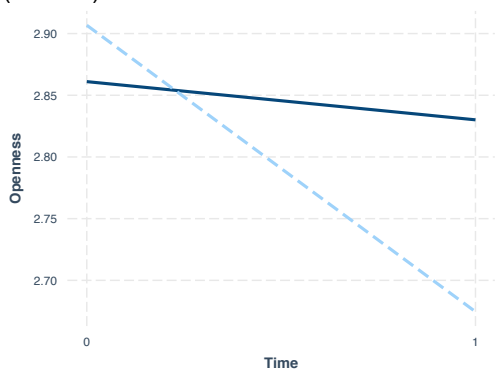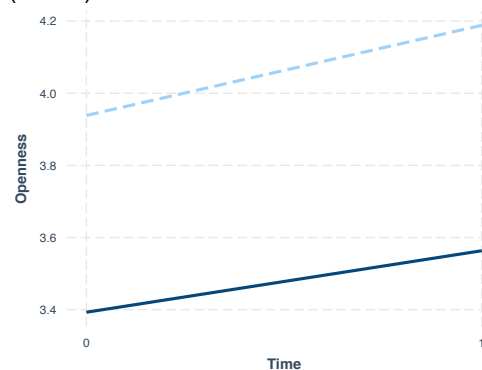
Fig. S1. Changes over time in intervention and waitlist control group. Dark blue = change in intervention group; light blue = change in waitlist control group; intervention group: change from Pretest 2 to Posttest; waitlist control group: change from Pretest 1 to Pretest 2.
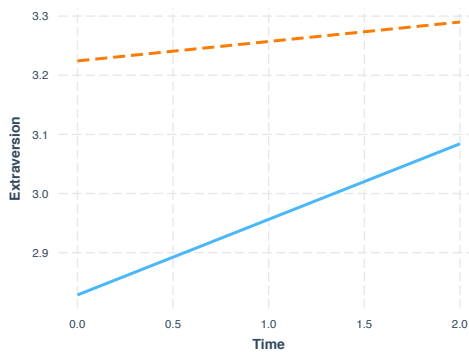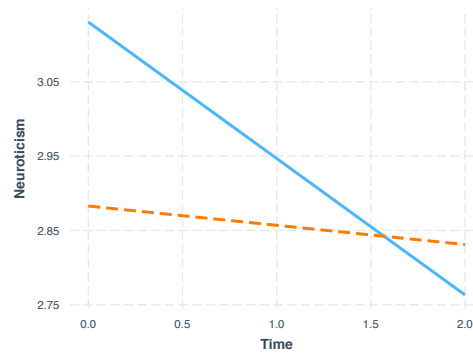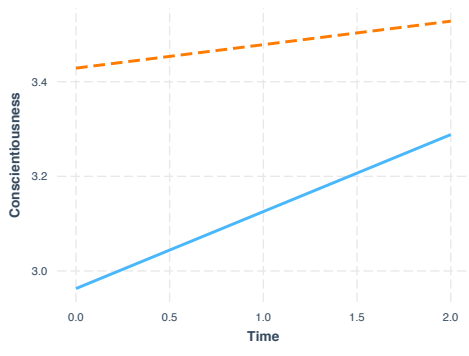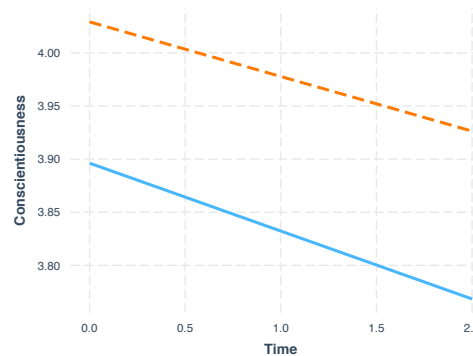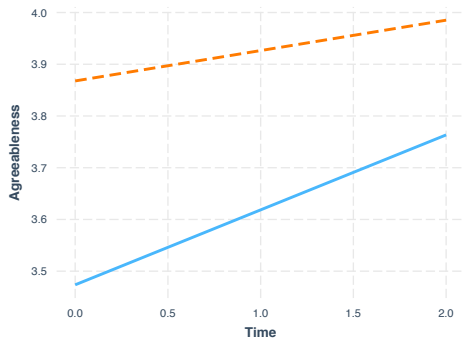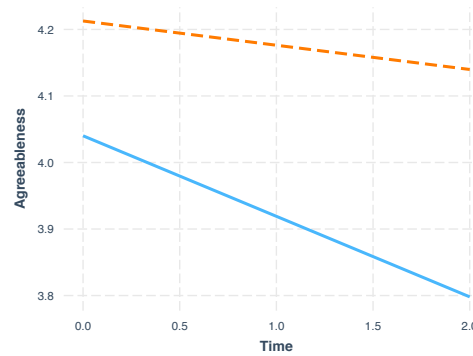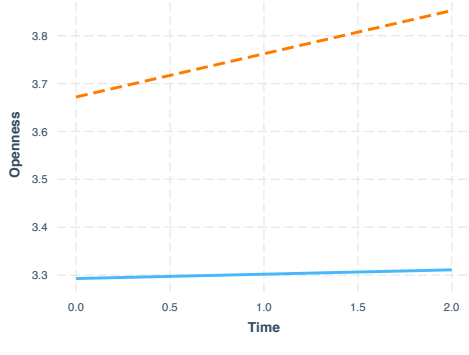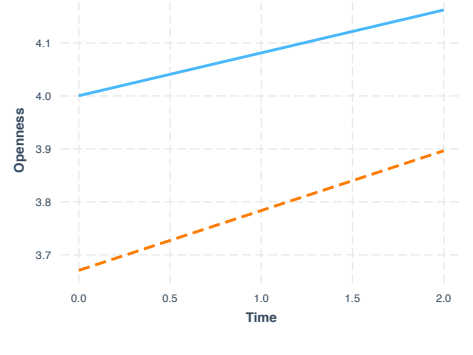
Fig. S2. Changes in self- and observer-reports from Pretest 2 to Follow-up. Blue = Change in self-reports; orange = change in observer-reports.
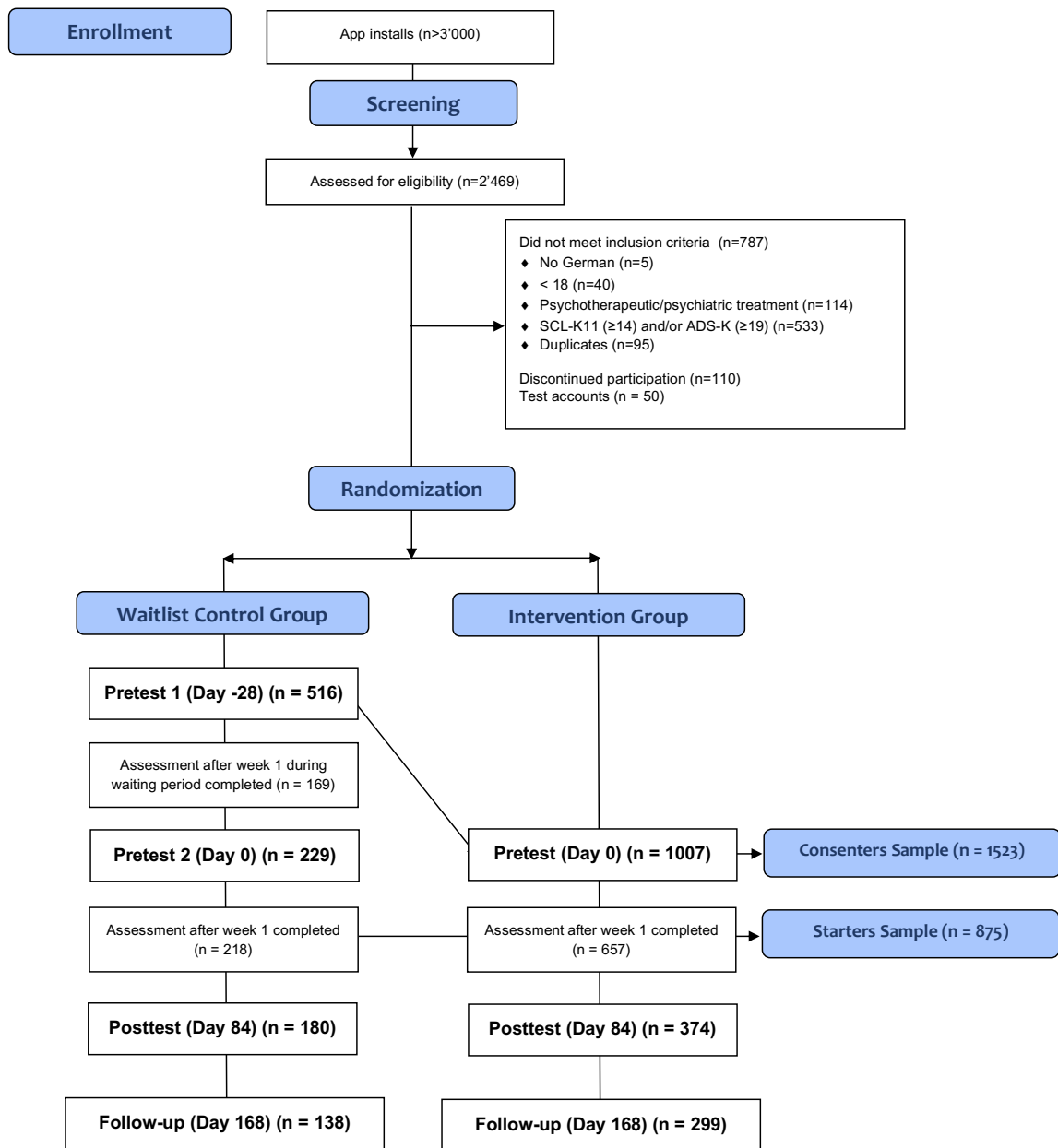
Fig. S3. Flowchart of the study with the two intent-to-treat samples (Consenters versus Starters).

Table S1. Means and Standard Deviations for Personality Traits Across Change Goals – Waitlist Control Group

Outcome	Change goal	Pretest 1 (Day -28)			Pretest 2 (Day 0)			Effect size across time	Test-retest
		N	*M*	*SD*	*N*	*M*	*SD*	$d_{T1, T2}$	$r_{T1, T2}$
Extraversion									
	E +	127	2.82	0.63	52	2.76	0.65	-0.14	0.75
	E -	1	3.92	-	1	3.92	-	-	-
	Other	389	3.38	0.67	177	3.32	0.66	-0.16	0.84
Neuroticism									
	N -	141	3.05	0.55	75	3.11	0.63	0.14	0.71
	Other	375	2.55	0.60	154	2.62	0.55	0.15	0.69
Conscientiousness									
	C +	136	2.99	0.59	53	2.95	0.47	-0.10	0.78
	C -	11	3.98	0.53	6	3.86	0.69	-	-
	Other	369	3.58	0.63	170	3.46	0.58	-0.29	0.79
Agreeableness									
	A +	20	3.10	0.51	9	3.27	0.50	-	-
	A -	40	4.12	0.39	17	4.01	0.56	-	-
	Other	456	3.86	0.49	203	3.73	0.50	-0.39	0.77
Openness									
	O +	32	3.36	0.63	14	3.07	0.63	-	-
	O -	6	3.78	0.69	2	4.58	0.12	-	-
	Other	478	3.75	0.61	213	3.61	0.63	-0.38	0.82
Selected Trait	Increase	315	2.96	0.62	128	2.91	0.57	-0.12	0.77
Selected Trait	Decrease	201	3.35	0.70	101	3.34	0.73	-0.02	0.82

Note. Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness; Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness; The effect size across time was a standardized mean difference and was calculated by subtracting the mean of the Pretest 2 from the mean of the Pretest 1 and dividing this raw mean difference by the standard deviation of the raw scores at Pretest 1 and taking the test-retest correlation into account (Morris & DeShon, 2002). Cohen's *d*'s tend to be biased/larger in small samples. This over-estimation is due to a bias of standard deviations, which tend to be lower than the population's *SD* in small samples. Thus, we only report *d*'s for change goals with *N* > 50 at Pretest 1.

Table S2. Change over Time in Personality Traits in Waitlist Control Group

Change Goal	Increase (n = 315)	Decrease (n = 201)
Fixed effects		
Intercept		
Estimate (SE)	3.41*** (0.16)	4.07*** (0.22)
95% CI	2.89; 3.74	3.73; 4.40
Time		
Estimate (SE)	-0.05 (0.04)	0.02 (0.04)
95% CI	-0.12; 0.02	-0.06; 0.10

Note. Consenters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness; Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness; Controlled for age, gender, and conversation style. We also included dummy variables to control for participants' change goals.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S3. Means and Standard Deviations for Personality Traits Across Change Goals

Outcome	Change Goal	Pretest 2			Posttest			Follow-up			Effect size across time			Test-retest		
		N	M	SD	N	M	SD	N	M	SD	$d_{T1, T2}$	$d_{T2, T3}$	$d_{T1, T3}$	$r_{T1, T2}$	$r_{T2, T3}$	$r_{T1, T3}$
Extraversion																
	E +	300	2.82	0.62	110	3.07	0.58	96	3.08	0.61	0.54	0.03	0.58	0.72	0.85	0.74
	E -	3	3.92	0.46	1	3.83	-	1	3.75	-	-	-	-	-	-	-
	Other	935	3.38	0.66	444	3.38	0.62	341	3.37	0.65	0.00	-0.03	-0.03	0.80	0.86	0.81
Neuroticism																
	N -	339	3.14	0.61	169	2.91	0.60	137	2.81	0.61	-0.43	-0.22	-0.54	0.62	0.71	0.50
	Other	896	2.55	0.60	385	2.50	0.61	300	2.51	0.63	-0.10	0.03	-0.09	0.68	0.80	0.69
Conscientiousness																
	C +	314	2.95	0.61	140	3.19	0.63	101	3.24	0.59	0.45	0.12	0.58	0.62	0.76	0.66
	C -	35	3.88	0.56	19	3.96	0.61	14	3.93	0.55	-	-	-	-	-	-
	Other	886	3.56	0.64	395	3.64	0.60	322	3.64	0.57	0.18	0.00	0.16	0.73	0.82	0.70
Agreeableness																
	A +	52	3.46	0.54	25	3.63	0.61	20	3.83	0.48	0.37	0.60	1.01	0.63	0.85	0.77
	A -	75	4.07	0.48	36	3.84	0.42	27	3.78	0.48	-0.54	-0.28	-0.67	0.60	0.87	0.59
	Other	1108	3.83	0.51	493	3.83	0.50	390	3.83	0.51	0.00	0.00	0.00	0.70	0.81	0.64
Openness																
	O +	95	3.28	0.66	44	3.30	0.72	35	3.30	0.74	0.04	0.00	0.04	0.72	0.90	0.73
	O -	24	4.00	0.56	9	4.06	0.63	5	4.02	0.79	-	-	-	-	-	-
	Other	1116	3.68	0.64	501	3.72	0.68	397	3.74	0.68	0.11	0.06	0.17	0.83	0.89	0.84
Selected Trait	Increase	762	2.98	0.64	319	3.20	0.64	252	3.23	0.64	0.44	0.08	0.52	0.69	0.83	0.72
Selected Trait	Decrease	474	3.39	0.70	234	3.19	0.72	184	3.07	0.73	-0.41	-0.29	-0.58	0.76	0.83	0.69

Note. T1 = Pretest 2; T2 = Posttest; T3 = Follow-up assessment. The effect size across time was a standardized mean difference and was calculated by subtracting the mean of the later assessment from the mean of the earlier assessment and dividing this raw mean difference by the standard deviation of the raw scores at the earlier assessment and taking the test-retest correlation into account (Morris & DeShon, 2002). Cohen's d's tend to be biased/larger in small samples. This over-estimation is due to a bias of standard deviations, which tend to be lower than the population's SD in small samples. Thus, we only report d's for change goals with $N > 50$ at Pretest 2
.

Table S4. Change Over Time Self-Reports – Starters sample

Change Goal	Increase	Decrease	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Fixed effects	*(n = 510)*	*(n = 349)*	*(n = 193)*	*(n = 252)*	*(n = 221)*	*(n = 24)*	*(n = 34)*	*(n = 57)*	*(n = 62)*	*(n = 15)*
Intercept										
Estimate (SE)	3.09*** (0.12)	4.00*** (0.14)	3.83*** (0.17)	3.13*** (0.15)	2.89*** (0.18)	3.65*** (0.60)	3.79*** (0.28)	3.97*** (0.20)	2.57*** (0.34)	4.01*** (0.66)
95% CI	2.85; 3.33	3.73; 4.28	2.50; 3.15	2.83; 3.43	2.54; 3.23	2.43; 4.89	3.22; 4.36	3.58; 4.36	1.90; 3.24	2.62; 5.39
Time										
Estimate (SE)	0.13*** (0.01)	-0.18*** (0.02)	0.13*** (0.02)	-0.20*** (0.02)	0.17*** (0.02)	-0.07 (0.04)	0.14** (0.05)	-0.13*** (0.04)	0.03 (0.04)	0.05 (0.05)
95% CI	0.11; 0.16	-0.21; -0.14	0.08; 0.17	-0.25; -0.16	0.13; 0.22	-0.16; 0.02	0.05; 0.23	-0.21; -0.06	-0.04; 0.11	-0.05; 0.15

Note. Starters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;
Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;
All models are controlled for age, gender, treatment group, and conversation style. Models with the collapsed samples also included dummy variables to control for participants' change goals.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S5. Change Over Time Self-Reports – Consenters sample

Change Goal	Increase	Decrease	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Fixed effects	*(n = 787)*	*(n = 498)*	*(n = 309)*	*(n = 356)*	*(n = 326)*	*(n = 37)*	*(n = 54)*	*(n = 80)*	*(n = 98)*	*(n = 24)*
Intercept										
Estimate (SE)	3.11*** (0.11)	3.99*** (0.12)	2.75*** (0.15)	3.15*** (0.13)	2.79*** (0.15)	4.16*** (0.43)	3.80*** (0.24)	3.77*** (0.18)	2.88*** (0.28)	4.02*** (0.42)
95% CI	2.90; 3.32	3.75; 4.23	2.46; 3.04	2.89; 3.40	2.49; 3.10	3.30; 5.04	3.31; 4.29	3.41; 4.12	2.32; 3.44	3.16; 4.88
Time										
Estimate (SE)	0.13*** (0.01)	-0.16*** (0.02)	0.13*** (0.02)	-0.19*** (0.02)	0.16*** (0.23)	-0.07 (0.04)	0.14** (0.05)	-0.13*** (0.04)	0.01 (0.04)	0.08 (0.07)
95% CI	0.10; 0.16	-0.20; -0.13	0.09; 0.17	-0.23; -0.14	0.12; 0.21	-0.15; 0.02	0.05; 0.23	-0.20; -0.06	-0.07; 0.09	-0.07; 0.23

Note. Consenters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;
Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;
All models are controlled for age, gender, treatment group, and conversation style. Models with the collapsed samples also included dummy variables to control for participants' change goals.
* *p* < .05, ** *p* < .01, *** *p* < .001.

Table S6. Change over Time in Personality Traits Between Change Goals – Consenters Sample

Change Goal Fixed effects	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Intercept								
Estimate (SE)	3.29*** (0.07)	2.81*** (0.07)	3.33*** (0.07)	3.19*** (0.09)	3.87*** (0.05)	3.81*** (0.05)	3.34*** (0.06)	3.32*** (0.07)
95% CI	3.15; 3.42	2.68; 2.95	3.21; 3.46	3.06; 3.33	3.77; 3.98	3.70; 3.93	3.24; 3.51	3.19; 3.46
Time								
Estimate (SE)	0.03* (0.01)	-0.04** (0.01)	0.00 (0.01)	0.05*** (0.01)	-0.00 (0.01)	0.01 (0.01)	0.03** (0.01)	0.03** (0.01)
95% CI	0.01; 0.05	-0.07; -0.02	-0.02; 0.03	0.02; 0.07	-0.02; 0.02	-0.00; 0.03	0.01; 0.05	0.01; 0.05
Change goal								
Estimate (SE)	-0.53*** (0.04)	0.52*** (0.04)	-0.61*** (0.04)	0.45** (0.11)	-0.35*** (0.07)	0.21*** (0.06)	-0.38*** (0.07)	0.36** (0.13)
95% CI	-0.61; -0.44	0.44; 0.59	-0.69; -0.53	0.24; 0.67	-0.48; -0.21	0.10; 0.33	-0.51; -0.25	0.10; 0.62
Time by change goal								
Estimate (SE)	0.10*** (0.02)	-0.15*** (0.02)	0.16*** (0.02)	-0.10 (0.06)	0.15*** (0.04)	-0.13*** (0.04)	-0.02 (0.03)	0.06 (0.08)
95% CI	0.06; 0.14	-0.19; -0.10	0.11; 0.20	-0.22; 0.01	0.06; 0.23	-0.20; -0.06	-0.08; 0.04	-0.09; 0.20

Note. Consenters sample: n = 1285; Change goal: 1 = selected change goal, 0 = people did not select this change goal; controlled for age, gender, treatment group, and conversation style.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S7. Means and Standard Deviations for Observer-Reported Personality Traits Across Change Goals

Outcome	Change Goal	Pretest 2			Posttest			Follow-up			Effect size across time			Test-retest		
		N	M	SD	N	M	SD	N	M	SD	$d_{T1, T2}$	$d_{T2, T3}$	$d_{T1, T3}$	$r_{T1, T2}$	$r_{T2, T3}$	$r_{T1, T3}$
Extraversion																
	E +	69	3.23	0.65	60	3.23	0.56	40	3.36	0.57	0.00	0.40	0.33	0.70	0.83	0.82
	E -	1	4.50	-	1	4.50	-	1	4.67	-	-	-	-	-	-	-
	Other	337	3.52	0.69	282	3.47	0.62	223	3.53	0.64	-0.12	0.13	0.02	0.83	0.74	0.76
Neuroticism																
	N -	94	2.90	0.73	74	2.83	0.61	62	2.76	0.65	-0.14	-0.13	-0.20	0.77	0.61	0.54
	Other	246	2.34	0.68	208	2.37	0.63	161	2.35	0.67	0.06	-0.04	0.02	0.75	0.71	0.78
Conscientiousness																
	C +	92	3.43	0.71	75	3.51	0.71	62	3.55	0.69	0.24	0.08	0.22	0.89	0.72	0.71
	C -	11	4.05	0.46	9	3.91	0.69	7	4.04	0.53	-	-	-	0.88	0.95	0.77
	Other	337	3.82	0.71	282	3.79	0.67	223	3.84	0.66	-0.07	0.10	0.04	0.83	0.73	0.79
Agreeableness																
	A +	14	3.89	0.60	12	3.82	0.78	11	4.02	0.59	-	-	-	0.87	0.76	0.87
	A -	29	4.21	0.52	25	4.21	0.42	18	4.15	0.54	-	-	-	0.67	0.64	0.77
	Other	343	4.05	0.56	282	4.00	0.60	223	4.02	0.62	-0.13	0.04	-0.07	0.77	0.59	0.68
Openness																
	O +	25	3.71	0.68	21	3.68	0.67	19	3.93	0.75	-	-	-	0.81	0.76	0.90
	O -	4	3.73	0.52	4	3.67	0.36	2	4.08	0.12	-	-	-	0.76	-1.00	-1.00
	Other	337	3.86	0.62	282	3.78	0.65	223	3.89	0.68	-0.18	0.23	0.07	0.74	0.73	0.75
Selected Trait	Increase	200	3.43	0.71	168	3.45	0.68	132	3.59	0.67	0.05	0.30	0.35	0.83	0.76	0.80
Selected Trait	Decrease	136	3.31	0.88	113	3.27	0.84	90	3.19	0.88	-0.09	-0.17	-0.22	0.87	0.85	0.80

Note. T1 = Pretest 2; T2 = Posttest; T3 = Follow-up assessment. The effect size across time was a standardized mean difference and was calculated by subtracting the mean of the later assessment from the mean of the earlier assessment and dividing this raw mean difference by the standard deviation of the raw scores at the earlier assessment and taking the test-retest correlation into account (Morris & DeShon, 2002). Cohen's *d*'s tend to be biased/larger in small samples. This over-estimation is due to a bias of standard deviations, which tend to be lower than the population's *SD* in small samples. Thus, we only report *d*'s for change goals with $N > 50$ at Pretest 2.

Table S8. Change Over Time Observer-Reports – Starters sample

Change Goal	Increase	Decrease	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Fixed effects	*(n = 175)*	*(n = 120)*	*(n = 60)*	*(n = 83)*	*(n = 79)*	*(n = 8)*	*(n = 11)*	*(n = 25)*	*(n = 25)*	*(n = 3)*
Intercept										
Estimate (SE)	3.38*** (0.07)	3.97*** (0.19)	3.18*** (0.08)	2.89*** (0.07)	3.37*** (0.08)	4.03*** (0.19)	3.89*** (0.14)	4.28*** (0.08)	3.67*** (0.14)	3.49*** (0.18)
95% CI	3.23; 3.52	3.59; 4.35	3.03; 3.33	2.75; 3.03	3.21; 3.54	3.61; 4.46	3.61; 4.18	4.11; 4.44	3.40; 3.95	3.02; 3.97
Time										
Estimate (SE)	0.07*** (0.02)	-0.02 (0.03)	0.05 (0.03)	-0.02 (0.04)	0.07* (0.03)	-0.10 (0.08)	0.08 (0.06)	-0.03 (0.04)	0.09 (0.04)	0.20 (0.10)
95% CI	0.03; 0.10	-0.07; 0.03	-0.01; 0.11	-0.09; 0.05	0.01; 0.12	-0.26; 0.07	-0.05; 0.22	-0.11; 0.06	-0.00; 0.18	-0.02; 0.48

Note. Starters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;
Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;
Models with the collapsed samples also included dummy variables to control for participants' change goals.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S9. Change Over Time Observer-Reports – Consenters sample

Change Goal	Increase	Decrease	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Fixed effects	*(n* = 200)	*(n* = 136)	*(n* = 69)	*(n* = 91)	*(n* = 92)	*(n* = 11)	*(n* = 11)	*(n* = 29)	*(n* = 25)	*(n* = 4)
Intercept										
Estimate (SE)	3.43*** (0.07)	4.01*** (0.17)	3.22*** (0.07)	2.88*** (0.07)	3.43*** (0.07)	4.03*** (0.16)	3.87*** (0.16)	4.21*** (0.09)	3.67*** (0.14)	3.67*** (0.18)
95% CI	3.30; 3.56	3.68; 4.34	3.09; 3.36	2.75; 3.02	3.28; 3.57	3.70; 4.36	3.53; 4.21	4.03; 4.39	3.40; 3.95	3.23; 4.11
Time										
Estimate (SE)	0.05** (0.02)	-0.02 (0.03)	0.03 (0.03)	-0.03 (0.03)	0.05 (0.03)	-0.05 (0.06)	0.06 (0.06)	-0.04 (0.04)	0.09 (0.04)	0.11 (0.12)
95% CI	0.02; 0.08	-0.07; 0.02	-0.03; 0.09	-0.09; 0.04	-0.00; 0.10	-0.17; 0.07	-0.06; 0.18	-0.12; 0.04	-0.00; 0.18	-0.15; 0.41

Note. Consenters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;
Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;
Models with the collapsed samples also included dummy variables to control for participants' change goals.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S10. Change Over Time Observer-Reports by Change Goal – Starters sample

Group	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Fixed effects								
Intercept								
Estimate (SE)	3.56*** (0.04)	2.38*** (0.05)	3.95*** (0.04)	3.79*** (0.04)	4.05*** (0.03)	4.02*** (0.03)	3.84*** (0.04)	3.82 (0.04)
95% CI	3.48; 3.64	2.29; 2.47	3.86; 4.04	3.71; 3.87	3.98; 4.11	3.95; 4.09	3.76; 3.92	3.76; 3.90
Time								
Estimate (SE)	-0.01 (0.02)	-0.00 (0.02)	-0.02 (0.02)	0.00 (0.01)	-0.03 (0.02)	-0.02 (0.02)	-0.01 (0.01)	-0.00 (0.02)
95% CI	-0.04; 0.02	-0.04; 0.04	-0.06; 0.01	-0.03; 0.03	-0.06; 0.00	-0.05; 0.01	-0.04; 0.02	-0.03; 0.03
Change goal								
Estimate (SE)	-0.38*** (0.09)	0.51*** (0.09)	-0.58*** (0.09)	0.24 (0.25)	-0.15 (0.17)	0.26* (0.12)	-0.17 (0.13)	-0.34 (0.36)
95% CI	-0.56; -0.20	0.34; 0.58	-0.75; -0.41	-0.25; 0.73	-0.05; 0.19	0.03; 0.49	-0.43; 0.09	-1.05; 0.38
Time by change goal								
Estimate (SE)	0.06 (0.04)	-0.01 (0.04)	0.09** (0.03)	-0.10 (0.10)	0.11 (0.08)	-0.01 (0.05)	0.09 (0.05)	0.19 (0.15)
95% CI	-0.01; 0.13	-0.08; 0.06	0.03; 0.15	-0.29; 0.09	-0.05; 0.26	-0.11; 0.10	-0.00; 0.20	-0.11; 0.49

Note. Starters sample; n = 301.
* *p* < .05, ** *p* < .01, *** *p* < .001.

Table S11. Change Over Time Observer-Reports by Change Goal – Consenters sample

Change goal	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Fixed effects								
Intercept								
Estimate (SE)	3.58*** (0.04)	2.35*** (0.04)	3.95*** (0.04)	3.80*** (0.04)	4.05*** (0.03)	4.02*** (0.03)	3.86*** (0.04)	3.85*** (0.03)
95% CI	3.51; 3.66	2.27; 2.43	3.87; 4.03	3.73; 3.88	3.98; 4.11	3.96; 4.09	3.79; 3.93	3.78; 3.92
Time								
Estimate (SE)	-0.02 (0.01)	0.00 (0.02)	-0.03 (0.02)	-0.01 (0.01)	-0.04* (0.01)	-0.03* (0.01)	-0.01 (0.02)	-0.01 (0.01)
95% CI	-0.05; 0.01	-0.03; 0.04	-0.06; 0.00	-0.03; 0.02	-0.07; -0.01	-0.06; -0.00	-0.04; 0.02	-0.04; 0.02
Change goal								
Estimate (SE)	-0.36*** (0.09)	0.53*** (0.08)	-0.52*** (0.08)	0.23 (0.21)	-0.18 (0.16)	0.19 (0.11)	-0.19 (0.13)	-0.18 (0.32)
95% CI	-0.53; -0.19	0.37; 0.69	-0.68; -0.36	-0.19; 0.64	-0.49; 0.13	-0.03; 0.41	-0.45; 0.07	-0.81; 0.45
Time by change goal								
Estimate (SE)	0.05 (0.03)	-0.03 (0.03)	0.08** (0.03)	-0.05 (0.08)	0.10 (0.07)	-0.00 (0.05)	0.11* (0.05)	0.12 (0.15)
95% CI	-0.02; 0.12	-0.10; 0.04	0.02; 0.13	-0.19; 0.10	-0.04; 0.23	-0.11; 0.10	0.00; 0.21	-0.17; 0.41

Note. Consenters sample: n = 337.
* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S12. Change over Time in Personality Traits – Self- vs. Observer-Reports – Starters Sample

Change Goal Fixed effects	Increase in Extraversion (n = 253)	Decrease in Neuroticism (*n* = 335)	Increase in Conscientiousness (*n* = 300)	Decrease in Conscientiousness (*n* = 32)	Increase in Agreeableness (*n* = 45)	Decrease in Agreeableness (*n* = 82)	Increase in Openness (*n* = 87)	Decrease in Openness (n = 18)
Intercept								
Estimate (SE)	2.83*** (0.04)	3.17*** (0.04)	2.94*** (0.04)	3.85*** (0.12)	3.52*** (0.09)	4.08*** (0.05)	3.23*** (0.09)	4.00*** (0.14)
95% CI	2.75; 2.92	3.09; 3.24	2.86; 3.03	3.60; 4.09	3.35; 3.69	3.97; 4.19	3.06; 3.40	3.71; 4.30
Time								
Estimate (SE)	0.13*** (0.02)	-0.20*** (0.02)	0.17*** (0.02)	-0.07 (0.05)	0.15** (0.04)	-0.13*** (0.04)	0.03 (0.04)	0.05 (0.05)
95% CI	0.08; 0.17	-0.25; -0.16	0.13; 0.22	-0.16; 0.02	0.06; 0.24	-0.20; -0.06	-0.04; 0.10	-0.06; 0.16
Modality								
Estimate (SE)	0.35*** (0.09)	-0.28*** (0.08)	0.43*** (0.08)	0.18 (0.24)	0.39* (0.17)	0.20 (0.10)	0.44** (0.16)	-0.51 (0.34)
95% CI	0.18; 0.52	-0.43; -0.13	0.27; 0.60	-0.30; 0.67	0.03; 0.73	-0.00; 0.39	0.12; 0.76	-1.23; 0.21
Modality by time								
Estimate (SE)	-0.08 (0.04)	0.18*** (0.04)	-0.11** (0.04)	-0.03 (0.09)	-0.07 (0.08)	0.10 (0.06)	0.06 (0.06)	0.13 (0.10)
95% CI	-0.15; 0.00	0.10; 0.26	-0.18; -0.03	-0.20; 0.14	-0.24; 0.09	-0.01; 0.21	-0.06; 0.18	-0.08; 0.34

Note. Starters sample; Modality: Self = 0, Observer = 1.
* *p* < .05, ** *p* < .01, *** *p* < .001.

Table S13. Change over Time in Personality Traits – Self- vs. Observer-Reports – Consenters sample

Group Fixed effects	Increase in Extraversion (*n* = 378)	Decrease in Neuroticism (*n* = 447)	Increase in Conscientiousness (*n* = 418)	Decrease in Conscientiousness (*n* = 48)	Increase in Agreeableness (*n* = 68)	Decrease in Agreeableness (*n* = 109)	Increase in Openness (*n* = 123)	Decrease in Openness (*n* = 28)
Intercept								
Estimate (SE)	2.83*** (0.03)	3.13*** (0.03)	2.96*** (0.04)	3.89*** (0.09)	3.47*** (0.08)	4.04*** (0.05)	3.29*** (0.07)	4.00*** (0.11)
95% CI	2.76; 2.90	3.07; 3.19	2.89; 3.03	3.71; 4.08	3.32; 3.62	3.94; 4.14	3.16; 3.42	3.78; 4.22
Time								
Estimate (SE)	0.13*** (0.02)	-0.18*** (0.02)	0.16*** (0.02)	-0.06 (0.04)	0.14** (0.04)	-0.12*** (0.03)	0.01 (0.03)	0.08 (0.07)
95% CI	0.09; 0.17	-0.23; -0.14	0.12; 0.21	-0.14; 0.02	0.06; 0.23	-0.19; -0.05	-0.06; 0.08	-0.07; 0.23
Modality								
Estimate (SE)	0.40*** (0.08)	-0.25*** (0.07)	0.47*** (0.07)	0.13 (0.19)	0.39* (0.16)	0.17 (0.10)	0.38* (0.15)	-0.33 (0.28)
95% CI	0.24; 0.55	-0.39; -0.11	0.32; 0.61	-0.25; 0.51	0.07; 0.72	-0.02; 0.37	0.09; 0.67	-0.90; 0.24
Modality by time								
Estimate (SE)	-0.09* (0.04)	0.16*** (0.04)	-0.11** (0.04)	0.01 (0.07)	-0.09 (0.08)	0.08 (0.05)	0.08 (0.06)	0.03 (0.14)
95% CI	-0.17; -0.02	0.08; 0.23	-0.18; -0.04	-0.13; 0.15	-0.24; 0.07	-0.02; 0.19	-0.04; 0.21	-0.25; 0.32

Note. Consenters sample; Modality: Self = 0, Observer = 1.

* *p* < .05, ** *p* < .01, *** *p* < .001.

Table S14. Change over Time in Personality Traits – Self- vs. Observer-Reports – Only 30 Common Items

Group	Increase in Extraversion	Decrease in Neuroticism	Increase in Conscientiousness	Decrease in Conscientiousness	Increase in Agreeableness	Decrease in Agreeableness	Increase in Openness	Decrease in Openness
Fixed effects	(n = 378)	(n = 447)	(n = 418)	(n = 48)	(n = 68)	(n = 109)	(n = 123)	(n = 28)
Intercept								
Estimate (SE)	2.84*** (0.04)	3.13*** (0.03)	3.00*** (0.04)	3.94*** (0.10)	3.35*** (0.08)	4.08*** (0.06)	3.27*** (0.07)	3.97*** (0.12)
95% CI	2.77; 2.91	3.06; 3.20	2.93; 3.07	3.73; 4.14	3.19; 3.51	3.96; 4.19	3.13; 3.41	3.73; 4.21
Time								
Estimate (SE)	0.12*** (0.02)	-0.21*** (0.02)	0.15*** (0.02)	-0.06 (0.05)	0.16** (0.05)	-0.15*** (0.04)	-0.01 (0.04)	0.07 (0.09)
95% CI	0.08; 0.16	-0.25; -0.16	0.10; 0.19	-0.15; 0.04	0.06; 0.27	-0.22; -0.07	-0.09; 0.07	-0.11; 0.25
Modality								
Estimate (SE)	0.39*** (0.08)	-0.25** (0.08)	0.43*** (0.08)	0.10 (0.21)	0.52** (0.18)	0.14 (0.11)	0.40* (0.15)	-0.30 (0.31)
95% CI	0.23; 0.55	-0.40; -0.10	0.28; 0.58	-0.33; 0.51	0.17; 0.87	-0.08; 0.35	0.10; 0.70	-0.93; 0.33
Modality by time								
Estimate (SE)	-0.09* (0.04)	0.18*** (0.04)	-0.10** (0.04)	0.01 (0.09)	-0.10 (0.09)	0.11 (0.06)	0.10 (0.07)	0.04 (0.17)
95% CI	-0.16; -0.01	0.10; 0.26	-0.17; -0.03	-0.16; 0.17	-0.28; 0.07	-0.00; 0.23	-0.03; 0.24	-0.30; 0.39

Note. Consenters sample; Modality: Self = 0, Observer = 1.

* p < .05, ** p < .01, *** p < .001.

Table S15. Maintenance of Self-Reported Change from Posttest to Follow-up – Starters sample

Change Goal Fixed effects	Increase (*n* = 283)	Decrease (*n* = 214)	Increase in Extraversion (*n* = 100)	Decrease in Neuroticism (*n* = 156)	Increase in Conscientiousness (*n* = 121)	Decrease in Conscientiousness (*n* = 16)	Increase in Agreeableness (*n* = 22)	Decrease in Agreeableness (*n* = 34)	Increase in Openness (*n* = 40)	Decrease in Openness (*n* = 7)
Intercept										
Estimate (SE)	3.03*** (0.14)	2.78*** (0.14)	3.08*** (0.20)	3.92*** (0.18)	2.81*** (0.20)	3.05*** (0.53)	3.62*** (0.35)	3.49*** (0.23)	2.35*** (0.50)	3.30*** (0.61)
95% CI	2.76; 3.31	2.50; 3-06	2.69; 3.46	2.56; 3.29	2.41; 3.21	1.95; 4.16	2.92; 4.33	3.02; 3.95	1.35; 3.35	1.92; 4.68
Time										
Estimate (SE)	0.03 (0.02)	-0.08* (0.03)	-0.01 (0.03)	-0.11** (0.04)	0.08 (0.04)	-0.01 (0.07)	0.10 (0.09)	0.02 (0.05)	-0.07 (0.06)	0.13** (0.02)
95% CI	-0.02; 0.08	-0.15; -0.02	-0.08; 0.06	-0.19; -0.02	-0.01; 0.16	-0.15; 0.13	-0.07; 0.28	-0.09; 0.12	-0.19; 0.05	0.07; 0.18

Note. Starters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;

Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;

All models are controlled for age, gender, and conversation style. Models with the collapsed samples also included dummy variables to control for participants' change goals.

* *p* < .05, ** *p* < .01, *** *p* < .001.

Table S16. Maintenance of Self-Reported Change from Posttest to Follow-up – Consenters sample

Change Goal Fixed effects	Increase (*n* = 336)	Decrease (*n* = 248)	Increase in Extraversion (*n* = 118)	Decrease in Neuroticism (*n* = 178)	Increase in Conscientiousness (*n* = 146)	Decrease in Conscientiousness (*n* = 21)	Increase in Agreeableness (*n* = 26)	Decrease in Agreeableness (*n* = 38)	Increase in Openness (*n* = 46)	Decrease in Openness (*n* = 10)
Intercept										
Estimate (SE)	3.02*** (0.13)	2.88*** (0.13)	3.11*** (0.20)	3.03*** (0.17)	2.81*** (0.19)	3.31*** (0.48)	3.67*** (0.34)	3.48*** (0.22)	2.34*** (0.46)	3.71*** (0.47)
95% CI	2.76; 3.28	2.63; 3.14	2.72; 3.50	2.70; 3.37	2.43; 3.20	2.32; 4.29	2.98; 4.35	3.04; 3.91	1.42; 3.27	2.70; 4.72
Time										
Estimate (SE)	0.04 (0.02)	-0.08* (0.03)	0.03 (0.03)	-0.11** (0.04)	0.07 (0.04)	0.00 (0.06)	0.12 (0.08)	0.01 (0.05)	-0.07 (0.06)	0.12** (0.02)
95% CI	-0.00; 0.09	-0.14; -0.02	-0.04; 0.09	-0.18; -0.03	-0.01; 0.15	-0.13; 0.13	-0.04; 0.28	-0.09; 0.10	-0.19; 0.05	0.07; 0.18

Note. Consenters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;

Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;

All models are controlled for age, gender, and conversation style; Models with the collapsed samples also included dummy variables to control for participants' change goals.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S17. Maintenance of Observer-Reported Change from Posttest to Follow-up – Starters sample

Change Goal Fixed effects	Increase (*n* = 175)	Decrease (*n* = 120)	Increase in Extraversion (*n* = 60)	Decrease in Neuroticism (*n* = 83)	Increase in Conscientiousness (*n* = 92)	Decrease in Conscientiousness (*n* = 8)	Increase in Agreeableness (*n* = 11)	Decrease in Agreeableness (*n* = 25)	Increase in Openness (*n* = 25)	Decrease in Openness (*n* = 3)
Intercept										
Estimate (SE)	3.31*** (0.10)	2.83*** (0.10)	3.17*** (0.10)	2.86*** (0.13)	3.46*** (0.12)	3.61*** (0.23)	3.64*** (0.30)	4.26*** (0.14)	3.33*** (0.21)	3.14*** (0.37)
95% CI	3.11; 3.50	2.63; 3.03	2.95; 3.38	2.61; 3.12	3.22; 3.70	3.12; 4.10	3.00; 4.25	3.91; 4.53	2.90; 3.77	2.25; 4.02
Time										
Estimate (SE)	0.12* (0.05)	0.01 (0.06)	0.06 (0.06)	-0.02 (0.08)	0.03 (0.07)	0.20 (0.06)	0.25 (0.18)	-0.01 (0.09)	0.30* (0.11)	0.47 (0.24)
95% CI	0.03; 0.21	-0.11; 0.12	-0.06; 0.18	-0.17; 0.14	-0.10; 0.17	0.03; 0.36	-0.13; 0.64	-0.19; 0.17	0.06; 0.53	-0.12; 1.07

Note. Starters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;

Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;

Models with the collapsed samples also included dummy variables to control for participants' change goals.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S18. Maintenance of Observer-Reported Change from Posttest to Follow-up – Consenters sample

Change Goal Fixed effects	Increase ($n = 200$)	Decrease ($n = 136$)	Increase in Extraversion ($n = 69$)	Decrease in Neuroticism ($n = 91$)	Increase in Conscientiousness ($n = 92$)	Decrease in Conscientiousness ($n = 11$)	Increase in Agreeableness ($n = 14$)	Decrease in Agreeableness ($n = 29$)	Increase in Openness ($n = 25$)	Decrease in Openness ($n = 4$)
Intercept										
Estimate (SE)	3.36*** (0.09)	2.83*** (0.10)	3.15*** (0.10)	2.86*** (0.13)	3.46*** (0.12)	3.86*** (0.21)	3.67*** (0.30)	4.22*** (0.15)	3.33*** (0.21)	3.25*** (0.32)
95% CI	3.19; 3.54	2.64; 3.03	2.95; 3.35	2.61; 3.11	3.22; 3.70	3.42; 4.30	3.04; 4.28	3.91; 4.53	2.90; 3.77	2.51; 3.99
Time										
Estimate (SE)	0.10* (0.04)	-0.00 (0.06)	0.08 (0.06)	-0.02 (0.08)	0.03 (0.07)	0.05 (0.09)	0.18 (0.17)	-0.04 (0.09)	0.30* (0.11)	0.42 (0.22)
95% CI	0.01; 0.19	-0.11; 0.11	-0.04; 0.20	-0.17; 0.13	-0.10; 0.17	-0.14; 0.26	-0.18; 0.55	-0.23; 0.14	0.06; 0.53	-0.10; 0.94

Note. Consenters sample; Increase: Participants with the goals to increase in extraversion, conscientiousness, agreeableness, and openness;

Decrease: Participants with goals to decrease in neuroticism, conscientiousness, agreeableness, extraversion, and openness;

Models with the collapsed samples also included dummy variables to control for participants' change goals.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table S19. Descriptive Statistics Across Samples

	Consenters (n = 1,523)		Starters (n = 875)		Dropouts (n = 648)		$d_{consenters, starters}$	$d_{consenters, dropouts}$	$d_{starters, dropouts}$
	M	*SD*	*M*	*SD*	*M*	*SD*			
Age	24.99	6.85	25.66	7.52	24.26	5.92	0.09	-0.11	-0.20
Gender: Female	47.7%		53.8%		40.9%		-0.04	0.04	0.08
Motivation	3.94	0.52	3.99	0.51	3.87	0.52	0.10	-0.14	-0.23
Desire to change	5.11	1.22	5.22	1.18	4.97	1.26	0.09	-0.11	-0.21
Extraversion T1	3.25	0.69	3.25	0.69	3.26	0.71	0.00	0.01	0.01
Neuroticism T1	2.69	0.65	2.71	0.65	2.67	0.65	0.03	-0.03	-0.06
Conscientiousness T1	3.43	0.69	3.44	0.69	3.41	0.69	0.01	-0.03	-0.04
Agreeableness T1	3.85	0.52	3.87	0.51	3.83	0.53	0.04	-0.04	-0.08
Openness T1	3.69	0.64	3.68	0.64	3.70	0.63	-0.02	0.02	0.03

Note. Dropouts: Participants who did not start with the intervention; Motivation: range = 1-5; desire to change: range = 0-7. Personality traits: Self-reported levels at Pretest 1 for participants of the waitlist control group and Pretest 2 for the intervention group.

Table S20. Description of Change Goals

Change Goal	Description
Increase in extraversion	I want to be more extroverted, which means: - to be more sociable - to have more energy and zest for action - to be less quiet - to be more active and more enterprising - to take the lead more often - to take decisions in groups more often
Decrease in extraversion	I want to be calmer, which means: - to retreat more often - to leave decisions to others more often - to take the lead less often - to have less zest for action - to be less active and enterprising
Increase in agreeableness	I want to be more agreeable, which means: - to be more sensitive and warm-hearted - to be more polite and less harsh - to trust others more and believe in the good in humans - to appreciate others more - to treat others with respect - to be less distrustful of others
Decrease in agreeableness	I want to be more uncompromising, which means: - to be less influenced by the feelings of others - to represent my own opinion more often - to trust others less easily - to be more skeptical about others - to make fewer compromises - to be more self-conscious
Increase in conscientiousness	I want to be more conscientious, which means: - to be less messy - to procrastinate less - to be more reliable - to clean up more - to stay on a task until it's done - to be less careless
Decrease in conscientiousness	I want to be more easy going, which means: - to be more careless - to not feel the urge having to fulfill tasks right away - to procrastinate more often - to not always be reliable - to not always clean up immediately - to sometimes leave things messy
Decrease in neuroticism	I want to be more emotionally stable, which means:

	- to worry less often
	- to be depressed less often
	- to be more even-tempered
	- to stay more relaxed in stressful situations
	- to be less moody
	- to be more self-confident
Increase in openness	I want to be more open, which means:
	- to be more original and developing new ideas
	- to be more enthusiastic about new things
	- to think more about complex things and trying to understand them
	- to be more imaginative
	- to question traditions and routines more often
	- to be more curious
Decrease in openness	I want to be more objective, which means:
	- to be able to come to terms with simple solutions
	- to appreciate habits and routines I have more often
	- to bring more routine into my life
	- to be more conventional
	- to not always question everything
	- to not always try something new