Supporting information – Genetic correlates of psychological responses to the COVID-19 crisis in young adult twins in Great Britain

Supplementary Tables 4

1. Supplementary Table 1. Descriptive statistics at T1 for one twin randomly selected from each pair. 4
2. Supplementary Table 2. Descriptive statistics at T2 for one twin randomly selected from each pair. 6
3. Supplementary Table 3. Descriptive statistics for T1 to T2 differences for one twin randomly selected from each pair. 9
4. Supplementary Table 4. Descriptive statistics for T1 for one twin randomly selected from each pair broken down by zygosity. 11
5. Supplementary Table 5. Descriptive statistics for T2 for one twin randomly selected from each pair broken down by zygosity. 13
6. Supplementary Table 6. Descriptive statistics for T1 to T2 differences for one twin randomly selected from each pair broken down by zygosity. 15
7. Supplementary Table 7. Descriptive statistics at T1 for the twin that was not randomly selected from each pair in the main analyses. 17
8. Supplementary Table 8. Descriptive statistics at T2 for twin two randomly selected from each pair. 20
9. Supplementary Table 9. Descriptive statistics for T1 to T2 differences for twin two randomly selected from each pair. 22
10. Supplementary Table 10. Phenotypic correlations between T1 and T2 for the whole sample and split by males and females. 25
11. Supplementary Table 11. Measures, test-retest reliabilities and references. 26
12. Supplementary Table 12. Twin intraclass correlations and Falconer ACE estimates. 29
13. Supplementary Table 13. Twin intraclass correlations and Falconer ACE estimates. 30
14. Supplementary Table 14. Twin intraclass correlations and Falconer ACE estimates. 31
15. Supplementary Table 15. Whole sample model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance for variables (95% confidence intervals in parentheses). 32
16. Supplementary Table 16. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variable in the relationships theme (95% confidence intervals in parentheses). 34
17. Supplementary Table 17. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the thoughts and attitudes theme (95% confidence intervals in parentheses). 34
18. Supplementary Table 18. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the substance use theme (95% confidence intervals in parentheses) 36

19. Supplementary Table 19. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the wellbeing theme (95% confidence intervals in parentheses). 36
20. Supplementary Table 20. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the behaviours theme (95% confidence intervals in parentheses). 38
21. Supplementary Table 21. Bivariate model fit indices 39
22. Supplementary Table 22. For twins living together: T1 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 40
23. Supplementary Table 23. For twins living together: T2 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 42
24. Supplementary Table 24. For twins living together: T2 change twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 43
25. Supplementary Table 25. For twins living apart: T1 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 45
26. Supplementary Table 26. For twins living apart: T2 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 46
27. Supplementary Table 27. For twins living apart: T2 change twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 48
28. Supplementary Table 28. Male model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 50
29. Supplementary Table 29. Female model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses). 51
30. Supplementary Table 30. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in SES. 53
31. Supplementary Table 31. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in job/financial difficulties. 55

32. Supplementary Table 32. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in garden access during the lockdown. 56
33. Supplementary Table33. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in living conditions (number of rooms: people in home during the lockdown). 58
34. Supplementary Table 34. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in having been tested or suspected of having COVID-19. 59
35. Supplementary Table 35. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance for variables (95% confidence intervals in parentheses) corrected for variation in number of COVID-19 symptoms. 60
36. Supplementary Table 36. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance for variables (95% confidence intervals in parentheses) for variables corrected for variation in number of COVID-19 symptoms (two or more) vs none. 62

Supplementary Figures 64

1. Supplementary Figure 1. Variance in T2 change scores. 64
2. Supplementary Figure 2. Shared environmental (rC) and nonshared environmental correlations (rE). 65
3. Supplementary Figure 3. The Bivariate Cholesky decomposition..... 66

Supplementary Tables

Supplementary Table 1. Descriptive statistics at T1 for one twin randomly selected from each pair.

Construct	**All**					**Males**					**Females**					**ANOVA**[a]		
	N	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	Sex	*p*	R^2
Love and relationships	2548	1.00	5.00	3.57	1.21	846	1.00	5.00	3.39	1.19	1702	1.00	5.00	3.66	1.21	28.09	<.001	.01
Verbal peer victimisation	2349	0.00	8.00	2.01	2.52	765	0.00	8.00	2.43	2.73	1584	0.00	8.00	1.80	2.39	29.43	<.001	.01
Cyber peer victimisation	2349	0.00	8.00	0.56	1.41	765	0.00	8.00	0.52	1.40	1584	0.00	8.00	0.58	1.42	0.94	.333	.00
Physical peer victimisation	2349	0.00	8.00	0.19	0.79	765	0.00	8.00	0.32	0.99	1584	0.00	8.00	0.12	0.66	23.75	<.001	.01
Achievement motivation	2553	0.00	16.00	10.06	2.92	849	0.00	16.00	9.88	3.16	1704	0.00	16.00	10.15	2.78	4.46	.035	.00
Importance of Relationships	2553	0.00	20.00	15.84	3.59	849	0.00	20.00	14.59	3.96	1704	0.00	20.00	16.47	3.22	144.17	<.001	.06
Purpose in Life	2552	1.00	5.00	3.45	0.81	849	1.00	5.00	3.38	0.84	1703	1.00	5.00	3.49	0.79	9.58	.002	.00
Healthcare	2549	1.00	5.00	4.58	0.70	847	1.00	5.00	4.48	0.79	1702	1.00	5.00	4.63	0.64	21.34	<.001	.01
Community satisfaction	2539	1.00	5.00	3.60	0.75	842	1.00	5.00	3.59	0.73	1697	1.00	5.00	3.61	0.76	0.36	.552	.00
Attitudes towards money	2490	1.00	5.00	3.05	0.91	836	1.00	5.00	3.14	0.93	1654	1.00	5.00	3.00	0.90	13.90	<.001	.01

Alcohol frequency	2283	0.00	4.00	1.90	0.99	739	0.00	4.00	2.04	1.02	1544	0.00	4.00	1.83	0.97	21.00	<.001	.01
Alcohol quantity	2081	0.00	4.00	2.41	1.26	683	0.00	4.00	2.41	1.27	1398	0.00	4.00	2.41	1.26	0.00	.963	.00
Alcohol (frequency x quantity)	2283	0.00	16.00	4.67	3.68	739	0.00	16.00	5.01	3.86	1544	0.00	16.00	4.51	3.58	8.88	.003	.00
Ever smoked	2389	0.00	1.00	0.54	0.50	771	0.00	1.00	0.53	0.50	1618	0.00	1.00	0.54	0.50	0.59	.444	.00
Smoking frequency	265	1.00	4.00	1.31	0.55	79	1.00	3.00	1.39	0.63	186	1.00	4.00	1.27	0.52	2.17	.143	.01
Ever vaped	2392	0.00	1.00	0.24	0.43	771	0.00	1.00	0.27	0.44	1621	0.00	1.00	0.22	0.42	5.48	.019	.00
Vaping frequency	278	1.00	6.00	2.42	2.01	106	1.00	6.00	2.76	2.13	172	1.00	6.00	2.22	1.90	4.72	.031	.02
Ever used cannabis	2356	0.00	1.00	0.48	0.50	752	0.00	1.00	0.52	0.50	1604	0.00	1.00	0.46	0.50	6.30	.012	.00
Cannabis smoking frequency	398	1.00	5.00	1.57	0.78	164	1.00	5.00	1.71	0.89	234	1.00	5.00	1.48	0.69	7.68	.006	.02
Conduct problems	2522	0.00	8.00	1.51	1.24	841	0.00	8.00	1.53	1.22	1681	0.00	8.00	1.50	1.25	0.37	.541	.00
Emotional problems	2522	0.00	10.00	3.62	2.72	841	0.00	10.00	2.66	2.45	1681	0.00	10.00	4.10	2.72	180.80	<.001	.06
Hyperactivity	2522	0.00	10.00	3.30	2.20	841	0.00	10.00	3.33	2.21	1681	0.00	10.00	3.29	2.19	0.15	.703	.00
Peer problems	2522	0.00	10.00	2.15	1.83	841	0.00	10.00	2.14	1.73	1681	0.00	10.00	2.16	1.88	0.14	.713	.00

Prosocial behaviour	2522	0.00	10.00	7.70	1.89	841	1.00	10.00	7.01	2.01	1681	0.00	10.00	8.04	1.72	160.07	<.001	.07
General anxiety	2382	0.00	40.00	7.56	7.47	765	0.00	40.00	5.96	6.82	1617	0.00	40.00	8.31	7.65	56.86	<.001	.02
Depression	2520	0.00	16.00	4.39	4.12	840	0.00	16.00	3.65	3.68	1680	0.00	16.00	4.77	4.28	46.28	<.001	.02
Self-harm	2371	0.00	4.00	0.21	0.70	762	0.00	4.00	0.16	0.62	1609	0.00	4.00	0.23	0.73	4.85	.028	.00
Physical activity	2528	1.00	5.00	2.80	1.09	837	1.00	5.00	2.90	1.10	1691	1.00	5.00	2.75	1.09	10.43	.001	.00
Media use	2522	0.00	15.00	7.63	2.12	835	0.00	15.00	7.89	2.20	1687	0.00	15.00	7.51	2.07	17.27	<.001	.01
Volunteering	2519	0.00	8.00	2.80	2.10	840	0.00	8.00	2.64	2.03	1679	0.00	8.00	2.89	2.13	8.19	.004	.00

Note: Raw scores are used.

[a] *F and p values are reported with Welch's correction (Welch, 1951) as the assumption of homogeneity of variance was violated for several variables.*

Supplementary Table 2. Descriptive statistics at T2 for one twin randomly selected from each pair.

Construct	**All**					**Males**					**Females**					**ANOVA**[a]		
	N	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	Sex	*p*	R^2
Love and relationships	2042	1.00	5.00	3.68	1.09	633	1.00	5.00	3.57	1.10	1409	1.00	5.00	3.73	1.08	10.61	.001	.01
Verbal peer victimisation	2082	0.00	8.00	0.58	1.48	646	0.00	8.00	0.87	1.85	1436	0.00	8.00	0.45	1.26	22.13	<.001	.01
Cyber peer victimisation	2082	0.00	8.00	0.10	0.55	646	0.00	6.00	0.12	0.62	1436	0.00	8.00	0.09	0.52	1.32	.251	.00

Physical peer victimisation	2082	0.00	8.00	0.04	0.39	646	0.00	6.00	0.05	0.48	1436	0.00	8.00	0.04	0.34	0.65	.421	.00
Achievement motivation	2079	0.00	16.00	8.78	3.36	644	0.00	16.00	8.85	3.46	1435	0.00	16.00	8.75	3.31	0.22	.642	.00
Importance of Relationships	2081	0.00	20.00	15.42	3.71	646	0.00	20.00	14.09	3.98	1435	1.00	20.00	16.03	3.41	109.80	<.001	.06
Purpose in Life	2081	1.00	5.00	3.47	0.81	646	1.00	5.00	3.44	0.83	1435	1.00	5.00	3.48	0.80	0.63	.428	.00
Healthcare	2081	1.00	5.00	4.79	0.59	646	1.00	5.00	4.70	0.71	1435	1.00	5.00	4.84	0.51	16.23	<.001	.01
Community satisfaction	2081	1.00	5.00	3.55	0.70	646	1.40	5.00	3.52	0.67	1435	1.00	5.00	3.56	0.71	1.45	.228	.00
Attitudes towards money	2081	1.00	5.00	3.16	0.90	646	1.00	5.00	3.27	0.94	1435	1.00	5.00	3.12	0.88	9.22	.002	.00
Alcohol frequency	2070	0.00	4.00	2.00	1.27	643	0.00	4.00	2.07	1.33	1427	0.00	4.00	1.96	1.24	2.15	.143	.00
Alcohol quantity	1679	0.00	4.00	1.86	1.26	515	0.00	4.00	2.03	1.27	1164	0.00	4.00	1.79	1.25	9.57	.002	.01
Alcohol (frequency x quantity)	2069	0.00	16.00	4.07	4.26	642	0.00	16.00	4.52	4.53	1427	0.00	16.00	3.86	4.12	7.12	.008	.00
Ever smoked	2071	0.00	1.00	0.47	0.50	643	0.00	1.00	0.49	0.50	1428	0.00	1.00	0.46	0.50	0.47	.495	.00
Smoking frequency	266	1.00	4.00	1.33	0.61	74	1.00	4.00	1.26	0.55	192	1.00	4.00	1.36	0.63	0.78	.379	.00
Ever vaped	2072	0.00	1.00	0.21	0.40	643	0.00	1.00	0.25	0.43	1429	0.00	1.00	0.19	0.39	7.20	.007	.00
Vaping frequency	83	1.00	4.00	2.87	1.26	33	1.00	4.00	2.97	1.16	50	1.00	4.00	2.80	1.33	0.43	.515	.01

Ever used cannabis	2050	0.00	1.00	0.47	0.50	633	0.00	1.00	0.51	0.50	1417	0.00	1.00	0.46	0.50	4.08	.044	.00
Cannabis smoking frequency	148	1.00	5.00	1.64	1.04	56	1.00	5.00	1.73	1.18	92	1.00	5.00	1.58	0.95	0.15	.700	.00
Conduct problems	2069	0.00	7.00	1.51	1.19	643	0.00	7.00	1.50	1.24	1426	0.00	7.00	1.52	1.17	0.93	.336	.00
Emotional problems	2069	0.00	10.00	3.16	2.70	643	0.00	10.00	2.03	2.29	1426	0.00	10.00	3.67	2.72	199.44	<.001	.08
Hyperactivity	2069	0.00	10.00	4.22	2.26	643	0.00	10.00	4.05	2.25	1426	0.00	10.00	4.30	2.26	6.32	.012	.00
Peer problems	2069	0.00	10.00	2.24	1.66	643	0.00	8.00	2.37	1.62	1426	0.00	10.00	2.19	1.68	3.98	.046	.00
Prosocial behaviour	2069	0.00	10.00	6.90	1.95	643	0.00	10.00	6.15	1.99	1426	1.00	10.00	7.24	1.84	118.18	<.001	.06
General anxiety	2069	0.00	40.00	8.88	7.79	643	0.00	35.00	6.42	6.68	1426	0.00	40.00	9.99	8.00	108.97	<.001	.05
Depression	2069	0.00	16.00	4.51	4.01	643	0.00	16.00	3.33	3.43	1426	0.00	16.00	5.03	4.14	91.36	<.001	.04
Self-harm	2044	0.00	4.00	0.06	0.32	636	0.00	2.00	0.03	0.19	1408	0.00	4.00	0.07	0.37	11.70	.001	.00
Physical activity	2068	1.00	5.00	2.63	1.09	643	1.00	5.00	2.63	1.10	1425	1.00	5.00	2.63	1.09	0.01	.924	.00
Media use	2068	0.00	15.00	7.12	2.36	643	0.00	15.00	7.28	2.49	1425	0.00	15.00	7.05	2.30	2.86	.091	.00
Volunteering	2068	0.00	8.00	1.09	1.33	643	0.00	8.00	1.03	1.36	1425	0.00	8.00	1.12	1.31	2.37	.124	.00

Note: Raw scores are used.

[a] F and p values are reported with Welch's correction (Welch, 1951) as the assumption of homogeneity of variance was violated for several variables.

Supplementary Table 3. Descriptive statistics for T1 to T2 differences for one twin randomly selected from each pair.

Construct	All						Males						Females						ANOVA[a]		
	N	Min	Max	*M*	*SD*	*d*	*n*	Min	Max	*M*	*SD*	*d*	*n*	Min	Max	*M*	*SD*	d	Sex	*p*	R^2
Love and relationships	1832	-4.0	4.0	0.08	1.24	0.06	539	-4.0	4.0	0.16	1.24	0.13	1293	-4.0	4.0	0.05	1.23	0.04	3.05	.081	.00
Verbal peer victimisation	1760	-8.0	8.0	-1.44	2.48	0.58	516	-8.0	8.0	-1.62	2.76	0.59	1244	-8.0	8.0	-1.37	2.34	0.59	3.13	.077	.00
Cyber peer victimisation	1760	-8.0	5.0	-0.43	1.35	0.31	516	-8.0	5.0	-0.35	1.38	0.25	1244	-8.0	5.0	-0.46	1.35	0.34	2.32	.128	.00
Physical peer victimisation	1760	-8.0	8.0	-0.13	0.83	0.15	516	-8.0	6.0	-0.26	1.10	0.23	1244	-7.0	8.0	-0.07	0.67	0.11	12.05	.001	.01
Achievement motivation	1872	-11.0	9.0	-1.32	2.79	0.47	551	-11.0	8.0	-1.13	2.73	0.42	1321	-11.0	9.0	-1.39	2.81	0.50	3.51	.061	.00
Importance of Relationships	1872	-15.0	15.0	-0.49	3.11	0.16	551	-14.0	15.0	-0.69	3.59	0.19	1321	-15.0	14.0	-0.40	2.88	0.14	2.70	.101	.00
Purpose in Life	1871	-3.8	2.8	0.01	0.65	0.01	551	-2.0	2.2	0.03	0.66	0.04	1320	-3.8	2.8	0.00	0.64	0.00	0.67	.412	.00
Healthcare	1869	-4.0	4.0	0.23	0.74	0.32	550	-4.0	4.0	0.22	0.79	0.28	1319	-4.0	4.0	0.24	0.72	0.33	0.23	.629	.00
Community satisfaction	1865	-3.6	3.8	-0.05	0.78	0.07	551	-2.4	2.4	-0.07	0.75	0.09	1314	-3.6	3.8	-0.05	0.79	0.06	0.41	.522	.00
Attitudes towards money	1831	-3.0	4.0	0.12	0.99	0.12	546	-3.0	3.0	0.09	1.01	0.09	1285	-3.0	4.0	0.13	0.98	0.13	0.49	.486	.00

Alcohol frequency	1692	-4.0	4.0	0.21	1.10	0.19	491	-4.0	4.0	0.11	1.14	0.09	1201	-4.0	4.0	0.25	1.08	0.23	5.26	.022	.00
Alcohol quantity	1509	-4.0	4.0	-0.67	1.56	0.43	454	-4.0	4.0	-0.52	1.51	0.34	1055	-4.0	4.0	-0.74	1.58	0.47	4.44	.036	.00
Alcohol (frequency x quantity)	1706	-15.0	16.0	-0.67	4.24	0.16	494	-12.0	12.0	-0.59	4.25	0.14	1212	-15.0	16.0	-0.70	4.23	0.17	0.00	.978	.00
Ever smoked	1780	-1.0	1.0	-0.07	0.36	0.19	516	-1.0	1.0	-0.04	0.36	0.11	1264	-1.0	1.0	-0.08	0.36	0.22	4.02	.045	.00
Smoking frequency	134	-2.0	3.0	0.11	0.63	0.18	25	-2.0	1.0	-0.12	0.53	0.23	109	-1.0	3.0	0.17	0.65	0.26	5.46	.024	.03
Ever vaped	1782	-1.0	1.0	-0.04	0.36	0.10	516	-1.0	1.0	-0.04	0.37	0.10	1266	-1.0	1.0	-0.03	0.35	0.10	0.01	.915	.00
Vaping frequency	36	-3.0	3.0	-0.69	1.67	0.42	14	-3.0	3.0	-1.07	1.54	0.69	22	-2.0	3.0	-0.45	1.74	0.26	1.24	.275	.03
Ever used cannabis	1750	-1.0	1.0	-0.02	0.33	0.05	500	-1.0	1.0	-0.02	0.30	0.05	1250	-1.0	1.0	-0.02	0.34	0.05	0.00	1<.001	.00
Cannabis smoking frequency	87	-2.0	3.0	-0.30	0.85	0.35	34	-2.0	1.0	-0.29	0.68	0.44	53	-2.0	3.0	-0.30	0.95	0.32	0.00	.965	.00
Conduct problems	1838	-7.0	5.0	-0.01	1.39	0.01	545	-6.0	5.0	-0.06	1.39	0.04	1293	-7.0	5.0	0.01	1.39	0.01	1.06	.304	.00
Emotional problems	1838	-9.0	8.0	-0.44	2.45	0.18	545	-8.0	7.0	-0.59	2.11	0.28	1293	-9.0	8.0	-0.38	2.58	0.15	3.18	.075	.00
Hyperactivity	1838	-7.0	8.0	0.98	2.34	0.42	545	-5.0	8.0	0.83	2.23	0.37	1293	-7.0	8.0	1.05	2.38	0.44	3.52	.061	.00

Peer problems	1838	-6.0	5.0	0.07	1.58	0.05	545	-5.0	4.0	0.18	1.60	0.11	1293	-6.0	5.0	0.03	1.58	0.02	3.40	.066	.00
Prosocial behaviour	1838	-8.0	8.0	-0.84	1.92	0.44	545	-8.0	6.0	-0.89	2.03	0.44	1293	-7.0	8.0	-0.81	1.87	0.44	0.57	.450	.00
General anxiety	1774	-32.0	34.0	1.38	6.90	0.20	513	-32.0	26.0	0.48	6.14	0.08	1261	-27.0	34.0	1.74	7.15	0.24	13.88	<.001	.01
Depression	1837	-16.0	15.0	0.20	3.76	0.05	545	-16.0	12.0	-0.21	3.32	0.06	1292	-13.0	15.0	0.37	3.92	0.09	10.51	.001	.00
Self-harm	1742	-4.0	4.0	-0.14	0.66	0.21	504	-4.0	2.0	-0.13	0.62	0.22	1238	-4.0	4.0	-0.14	0.67	0.21	0.07	.793	.00
Physical activity	1846	-4.0	4.0	-0.17	1.12	0.15	545	-3.5	3.0	-0.28	1.08	0.26	1301	-4.0	4.0	-0.12	1.14	0.11	8.41	.004	.00
Media use	1841	-10.0	10.0	-0.48	2.29	0.21	545	-10.0	6.0	-0.59	2.21	0.26	1296	-10.0	10.0	-0.43	2.32	0.18	1.86	.173	.00
Volunteering	1837	-8.0	6.0	-1.80	2.13	0.84	545	-8.0	5.0	-1.77	2.10	0.84	1292	-8.0	6.0	-1.81	2.15	0.84	0.13	.715	.00

Note: Raw scores are used.

[a] F and p values are reported with Welch's correction (Welch, 1951) as the assumption of homogeneity of variance was violated for several variables.

Supplementary Table 4. Descriptive statistics for T1 for one twin randomly selected from each pair broken down by zygosity.

	T1									
Construct	**MZ**					**DZ**				
	n	**Min**	**Max**	**M**	**SD**	**n**	**Min**	**Max**	**M**	**SD**
Love and relationships	987	1.00	5.00	3.60	1.18	1544	1.00	5.00	3.55	1.23
Verbal peer victimisation	911	0.00	8.00	1.78	2.39	1423	0.00	8.00	2.15	2.59
Cyber peer victimisation	911	0.00	8.00	0.52	1.35	1423	0.00	8.00	0.58	1.45

Physical peer victimisation	911	0.00	8.00	0.16	0.73	1423	0.00	8.00	0.20	0.81
Achievement motivation	986	0.00	16.00	10.08	2.91	1550	0.00	16.00	10.05	2.92
Importance of Relationships	986	0.00	20.00	15.91	3.56	1550	0.00	20.00	15.80	3.61
Purpose in Life	985	1.00	5.00	3.51	0.77	1550	1.00	5.00	3.42	0.83
Healthcare	984	1.00	5.00	4.59	0.68	1548	1.00	5.00	4.58	0.71
Community satisfaction	985	1.40	5.00	3.60	0.75	1537	1.00	5.00	3.60	0.75
Attitudes towards money	970	1.00	5.00	3.05	0.90	1504	1.00	5.00	3.05	0.92
Alcohol frequency	882	0.00	4.00	1.83	0.99	1388	0.00	4.00	1.94	0.99
Alcohol quantity	796	0.00	4.00	2.44	1.26	1274	0.00	4.00	2.39	1.27
Alcohol (frequency x quantity)	882	0.00	16.00	4.57	3.69	1388	0.00	16.00	4.74	3.68
Ever smoked	928	0.00	1.00	0.51	0.50	1445	0.00	1.00	0.55	0.50
Smoking frequency	93	1.00	4.00	1.26	0.57	170	1.00	3.00	1.34	0.54
Ever vaped	929	0.00	1.00	0.23	0.42	1447	0.00	1.00	0.24	0.43
Vaping frequency	102	1.00	6.00	2.38	2.08	175	1.00	6.00	2.46	1.97
Ever used cannabis	915	0.00	1.00	0.45	0.50	1425	0.00	1.00	0.50	0.50
Cannabis smoking frequency	143	1.00	5.00	1.50	0.73	253	1.00	5.00	1.61	0.81

Conduct problems	972	0.00	8.00	1.52	1.20	1536	0.00	8.00	1.51	1.27
Emotional problems	972	0.00	10.00	3.60	2.68	1536	0.00	10.00	3.63	2.75
Hyperactivity	972	0.00	10.00	3.22	2.15	1536	0.00	10.00	3.35	2.23
Peer problems	972	0.00	10.00	2.14	1.83	1536	0.00	9.00	2.16	1.84
Prosocial behaviour	972	0.00	10.00	7.67	1.90	1536	0.00	10.00	7.72	1.88
General anxiety	922	0.00	40.00	7.29	7.41	1444	0.00	40.00	7.74	7.52
Depression	971	0.00	16.00	4.29	4.12	1535	0.00	16.00	4.46	4.13
Self-harm	916	0.00	4.00	0.19	0.66	1439	0.00	4.00	0.22	0.72
Physical activity	982	1.00	5.00	2.79	1.08	1529	1.00	5.00	2.81	1.10
Media use	980	0.00	15.00	7.55	2.11	1525	0.00	15.00	7.69	2.12
Volunteering	970	0.00	8.00	2.81	2.10	1535	0.00	8.00	2.81	2.10

Note: Raw scores are used.

Supplementary Table 5. Descriptive statistics for T2 for one twin randomly selected from each pair broken down by zygosity.

	T2									
Construct	**MZ**					**DZ**				
	n	**Min**	**Max**	**M**	**SD**	**n**	**Min**	**Max**	**M**	**SD**
Love and relationships	781	1.00	5.00	3.69	1.06	1246	1.00	5.00	3.67	1.11
Verbal peer victimisation	797	0.00	8.00	0.53	1.38	1270	0.00	8.00	0.61	1.54
Cyber peer victimisation	797	0.00	5.00	0.09	0.50	1270	0.00	8.00	0.11	0.59

Physical peer victimisation	797	0.00	6.00	0.04	0.35	1270	0.00	8.00	0.04	0.41
Achievement motivation	796	0.00	16.00	8.71	3.31	1268	0.00	16.00	8.84	3.39
Importance of Relationships	797	0.00	20.00	15.27	3.80	1269	1.00	20.00	15.51	3.65
Purpose in Life	797	1.00	5.00	3.53	0.77	1269	1.00	5.00	3.43	0.83
Healthcare	797	1.00	5.00	4.77	0.66	1269	1.00	5.00	4.81	0.54
Community satisfaction	797	1.40	5.00	3.54	0.68	1269	1.00	5.00	3.55	0.71
Attitudes towards money	797	1.00	5.00	3.14	0.88	1269	1.00	5.00	3.18	0.91
Alcohol frequency	792	0.00	4.00	1.93	1.26	1263	0.00	4.00	2.04	1.26
Alcohol quantity	633	0.00	4.00	1.83	1.25	1035	0.00	4.00	1.88	1.27
Alcohol (frequency x quantity)	792	0.00	16.00	3.87	4.18	1262	0.00	16.00	4.19	4.31
Ever smoked	793	0.00	1.00	0.44	0.50	1263	0.00	1.00	0.49	0.50
Smoking frequency	87	1.00	3.00	1.21	0.49	175	1.00	4.00	1.39	0.66
Ever vaped	793	0.00	1.00	0.18	0.39	1264	0.00	1.00	0.22	0.41
Vaping frequency	35	1.00	4.00	2.69	1.32	48	1.00	4.00	3.00	1.20
Ever used cannabis	782	0.00	1.00	0.44	0.50	1254	0.00	1.00	0.50	0.50
Cannabis smoking frequency	58	1.00	4.00	1.67	1.02	87	1.00	5.00	1.61	1.08

Conduct problems	793	0.00	7.00	1.51	1.11	1261	0.00	7.00	1.52	1.23
Emotional problems	793	0.00	10.00	3.08	2.66	1261	0.00	10.00	3.20	2.72
Hyperactivity	793	0.00	10.00	4.06	2.18	1261	0.00	10.00	4.32	2.31
Peer problems	793	0.00	8.00	2.25	1.64	1261	0.00	10.00	2.23	1.68
Prosocial behaviour	793	1.00	10.00	6.84	1.98	1261	0.00	10.00	6.94	1.93
General anxiety	793	0.00	37.00	8.25	7.36	1261	0.00	40.00	9.23	7.99
Depression	793	0.00	16.00	4.24	3.75	1261	0.00	16.00	4.64	4.13
Self-harm	787	0.00	4.00	0.05	0.28	1242	0.00	4.00	0.06	0.35
Physical activity	793	1.00	5.00	2.68	1.08	1260	1.00	5.00	2.60	1.10
Media use	793	0.00	15.00	7.15	2.37	1260	0.00	15.00	7.11	2.36
Volunteering	793	0.00	8.00	1.04	1.30	1260	0.00	8.00	1.12	1.34

Note: Raw scores are used.

Supplementary Table 6. Descriptive statistics for T1 to T2 differences for one twin randomly selected from each pair broken down by zygosity.

	T2-T1 difference scores											
Construct	**MZ**						**DZ**					
	n	**Min**	**Max**	**M**	**SD**	***d*[a]**	**n**	**Min**	**Max**	**M**	**SD**	***d*[a]**
Love and relationships	726	-4.00	4.00	0.05	1.21	0.04	1095	-4.00	4.00	0.10	1.26	0.08
Verbal peer victimisation	700	-8.00	8.00	-1.31	2.35	0.56	1050	-8.00	8.00	-1.53	2.56	0.60
Cyber peer victimisation	700	-8.00	5.00	-0.39	1.30	0.30	1050	-8.00	5.00	-0.44	1.38	0.32
Physical peer victimisation	700	-6.00	6.00	-0.11	0.75	0.15	1050	-8.00	8.00	-0.14	0.88	0.16

Achievement motivation	746	-9.00	8.00	-1.33	2.70	0.49	1115	-11.00	9.00	-1.31	2.84	0.46
Importance of Relationships	746	-14.00	14.00	-0.57	3.02	0.19	1115	-15.00	15.00	-0.43	3.17	0.14
Purpose in Life	745	-2.00	2.40	0.03	0.66	0.05	1115	-3.80	2.80	-0.01	0.64	0.01
Healthcare	744	-4.00	4.00	0.21	0.77	0.28	1114	-4.00	4.00	0.24	0.71	0.34
Community satisfaction	741	-2.80	2.60	-0.06	0.75	0.08	1113	-3.60	3.80	-0.05	0.79	0.06
Attitudes towards money	732	-3.00	3.00	0.10	0.94	0.10	1089	-3.00	4.00	0.13	1.03	0.13
Alcohol frequency	669	-4.00	4.00	0.20	1.09	0.18	1014	-4.00	4.00	0.21	1.10	0.19
Alcohol quantity	583	-4.00	4.00	-0.69	1.54	0.45	918	-4.00	4.00	-0.67	1.58	0.42
Alcohol (frequency x quantity)	673	-15.00	16.00	-0.69	4.23	0.16	1023	-14.00	16.00	-0.66	4.25	0.16
Ever smoked	711	-1.00	1.00	-0.06	0.37	0.17	1058	-1.00	1.00	-0.07	0.36	0.20
Smoking frequency	48	-2.00	2.00	0.06	0.60	0.10	84	-1.00	3.00	0.13	0.65	0.20
Ever vaped	711	-1.00	1.00	-0.04	0.36	0.12	1060	-1.00	1.00	-0.03	0.36	0.08
Vaping frequency	17	-3.00	3.00	-0.71	1.61	0.44	19	-2.00	3.00	-0.68	1.77	0.39
Ever used cannabis	692	-1.00	1.00	0.00	0.33	0.01	1048	-1.00	1.00	-0.03	0.32	0.08
Cannabis smoking frequency	35	-2.00	2.00	-0.26	0.82	0.31	52	-2.00	3.00	-0.33	0.88	0.37
Conduct problems	727	-6.00	4.00	-0.04	1.35	0.03	1101	-7.00	5.00	0.01	1.42	0.00

Emotional problems	727	-9.00	7.00	-0.49	2.45	0.20	1101	-8.00	8.00	-0.42	2.45	0.17
Hyperactivity	727	-7.00	8.00	0.92	2.30	0.40	1101	-7.00	8.00	1.02	2.36	0.43
Peer problems	727	-5.00	4.00	0.13	1.60	0.08	1101	-6.00	5.00	0.03	1.57	0.02
Prosocial behaviour	727	-7.00	6.00	-0.82	1.91	0.43	1101	-8.00	8.00	-0.84	1.91	0.44
General anxiety	707	-27.00	30.00	1.02	6.96	0.15	1056	-32.00	34.00	1.58	6.85	0.23
Depression	726	-15.00	15.00	0.09	3.80	0.02	1101	-16.00	14.00	0.24	3.70	0.06
Self-harm	697	-4.00	3.00	-0.12	0.57	0.21	1034	-4.00	4.00	-0.15	0.71	0.22
Physical activity	734	-3.33	4.00	-0.11	1.10	0.10	1101	-4.00	3.50	-0.21	1.13	0.19
Media use	734	-10.00	10.00	-0.38	2.36	0.16	1096	-10.00	7.00	-0.54	2.24	0.24
Volunteering	726	-8.00	5.00	-1.84	2.03	0.91	1101	-8.00	6.00	-1.78	2.19	0.82

Note: Raw scores are used.

[a]Cohen's d for paired samples are reported.

Supplementary Table 7. Descriptive statistics at T1 for the twin that was not randomly selected from each pair in the main analyses.

Construct	**All**					**Males**					**Females**					**ANOVA[a]**		
	N	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	Sex	*p*	R^2
Love and relationships	2521	1.00	5.00	3.56	1.21	612	1.00	5.00	3.56	1.13	1354	1.00	5.00	3.71	1.09	23.70	<.001	.01
Verbal peer victimisation	2355	0.00	8.00	2.03	2.51	619	0.00	8.00	0.79	1.77	1386	0.00	8.00	0.43	1.15	52.65	<.001	.02
Cyber peer victimisation	2354	0.00	8.00	0.54	1.34	619	0.00	8.00	0.12	0.67	1386	0.00	8.00	0.10	0.56	0.34	.560	.00
Physical peer victimisation	2354	0.00	8.00	0.22	0.86	618	0.00	5.00	0.04	0.31	1386	0.00	6.67	0.03	0.26	40.97	<.001	.03

Achievement motivation	2533	0.00	16.00	10.16	2.90	615	0.00	16.00	9.00	3.43	1377	0.00	16.00	8.49	3.27	2.07	.151	.00
Importance of Relationships	2533	0.00	20.00	16.00	3.43	614	0.00	20.00	14.59	3.90	1378	0.00	20.00	15.81	3.53	101.10	<.001	.04
Purpose in Life	2532	1.00	5.00	3.45	0.81	617	1.00	5.00	3.48	0.82	1380	1.00	5.00	3.52	0.76	12.06	.001	.00
Healthcare	2527	1.00	5.00	4.57	0.71	617	1.00	5.00	4.71	0.69	1380	1.00	5.00	4.83	0.51	32.85	<.001	.01
Community satisfaction	2509	1.00	5.00	3.62	0.75	617	1.20	5.00	3.51	0.68	1380	1.00	5.00	3.58	0.70	3.38	.066	.00
Attitudes towards money	2436	1.00	5.00	3.04	0.91	617	1.00	5.00	3.24	0.99	1380	1.00	5.00	3.15	0.89	24.86	<.001	.01
Alcohol frequency	2295	0.00	4.00	1.91	1.01	615	0.00	4.00	2.12	1.28	1378	0.00	4.00	1.95	1.22	56.10	<.001	.02
Alcohol quantity	2082	0.00	4.00	2.49	1.26	507	0.00	4.00	2.12	1.26	1121	0.00	4.00	1.76	1.21	13.17	<.001	.01
Alcohol (frequency x quantity)	2294	0.00	16.00	4.90	3.87	614	0.00	16.00	4.77	4.46	1377	0.00	16.00	3.70	3.88	47.12	<.001	.02
Ever smoked	2389	0.00	1.00	0.56	0.50	613	0.00	1.00	0.51	0.50	1370	0.00	1.00	0.45	0.50	2.62	.106	.00
Smoking frequency	302	1.00	4.00	1.30	0.52	79	1.00	3.00	1.29	0.54	180	1.00	3.00	1.27	0.53	1.73	.190	.01
Ever vaped	2388	0.00	1.00	0.25	0.43	614	0.00	1.00	0.26	0.44	1371	0.00	1.00	0.18	0.38	16.39	<.001	.01
Vaping frequency	303	1.00	6.00	2.38	1.97	36	2.00	4.00	3.50	0.78	43	1.00	4.00	2.77	1.29	2.16	.143	.01

Ever used cannabis	2364	0.00	1.00	0.49	0.50	609	0.00	1.00	0.54	0.50	1361	0.00	1.00	0.42	0.49	24.86	<.001	.01
Cannabis smoking frequency	415	1.00	5.00	1.49	0.71	50	1.00	5.00	1.74	1.01	66	1.00	5.00	1.45	0.77	4.92	.027	.01
Conduct problems	2503	0.00	9.00	1.50	1.28	615	0.00	6.00	1.43	1.07	1374	0.00	7.00	1.47	1.21	9.37	.002	.00
Emotional problems	2503	0.00	10.00	3.59	2.67	615	0.00	10.00	2.09	2.33	1374	0.00	10.00	3.49	2.62	121.61	<.001	.04
Hyperactivity	2503	0.00	10.00	3.20	2.15	615	0.00	10.00	4.00	2.31	1374	0.00	10.00	4.12	2.14	14.58	<.001	.01
Peer problems	2503	0.00	10.00	2.14	1.79	615	0.00	10.00	2.36	1.58	1374	0.00	9.00	2.14	1.68	0.02	.904	.00
Prosocial behaviour	2503	0.00	10.00	7.71	1.84	615	0.00	10.00	6.17	2.09	1374	1.00	10.00	7.30	1.89	133.50	<.001	.05
General anxiety	2386	0.00	40.00	7.40	7.36	615	0.00	37.00	6.19	6.47	1374	0.00	40.00	9.53	7.54	60.90	<.001	.02
Depression	2502	0.00	16.00	4.45	4.11	615	0.00	16.00	3.33	3.36	1374	0.00	16.00	4.59	4.04	26.14	<.001	.01
Self-harm	2383	0.00	4.00	0.19	0.66	605	0.00	4.00	0.02	0.21	1363	0.00	4.00	0.04	0.26	18.63	<.001	.01
Physical activity	2492	1.00	5.00	2.83	1.06	615	1.00	5.00	2.61	1.12	1371	1.00	5.00	2.68	1.09	32.93	<.001	.01
Media use	2481	0.00	15.00	7.63	2.12	615	0.00	15.00	7.21	2.45	1371	0.00	14.00	6.87	2.24	40.44	<.001	.02
Volunteering	2502	0.00	8.00	2.87	2.10	615	0.00	8.00	1.00	1.27	1371	0.00	8.00	1.15	1.31	4.11	.043	.00

Note: Raw scores are used.

[a] F and p values are reported with Welch's correction (Welch, 1951) as the assumption of homogeneity of variance was violated for several variables.

Supplementary Table 8. Descriptive statistics at T2 for twin two randomly selected from each pair.

Construct	All					Males					Females					ANOVA[a]		
	N	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	*n*	Min	Max	*M*	*SD*	Sex	*p*	R^2
Love and relationships	1966	1.00	5.00	3.66	1.10	612	1.00	5.00	3.56	1.13	1354	1.00	5.00	3.71	1.09	7.37	.007	.00
Verbal peer victimisation	2005	0.00	8.00	0.54	1.38	619	0.00	8.00	0.79	1.77	1386	0.00	8.00	0.43	1.15	20.60	<.001	.01
Cyber peer victimisation	2005	0.00	8.00	0.11	0.60	619	0.00	8.00	0.12	0.67	1386	0.00	8.00	0.10	0.56	0.71	.400	.00
Physical peer victimisation	2004	0.00	6.67	0.03	0.28	618	0.00	5.00	0.04	0.31	1386	0.00	6.67	0.03	0.26	0.43	.512	.00
Achievement motivation	1992	0.00	16.00	8.64	3.33	615	0.00	16.00	9.00	3.43	1377	0.00	16.00	8.49	3.27	9.77	.002	.01
Importance of Relationships	1992	0.00	20.00	15.43	3.69	614	0.00	20.00	14.59	3.90	1378	0.00	20.00	15.81	3.53	44.23	<.001	.02
Purpose in Life	1997	1.00	5.00	3.51	0.78	617	1.00	5.00	3.48	0.82	1380	1.00	5.00	3.52	0.76	1.29	.257	.00
Healthcare	1997	1.00	5.00	4.80	0.58	617	1.00	5.00	4.71	0.69	1380	1.00	5.00	4.83	0.51	16.61	<.001	.01
Community satisfaction	1997	1.00	5.00	3.56	0.69	617	1.20	5.00	3.51	0.68	1380	1.00	5.00	3.58	0.70	4.29	.039	.00
Attitudes towards money	1997	1.00	5.00	3.18	0.92	617	1.00	5.00	3.24	0.99	1380	1.00	5.00	3.15	0.89	4.56	.033	.00
Alcohol frequency	1993	0.00	4.00	2.00	1.24	615	0.00	4.00	2.12	1.28	1378	0.00	4.00	1.95	1.22	7.91	.005	.00

Alcohol quantity	1628	0.00	4.00	1.87	1.24	507	0.00	4.00	2.12	1.26	1121	0.00	4.00	1.76	1.21	28.90	<.001	.02
Alcohol (frequency x quantity)	1991	0.00	16.00	4.03	4.10	614	0.00	16.00	4.77	4.46	1377	0.00	16.00	3.70	3.88	26.21	<.001	.01
Ever smoked	1983	0.00	1.00	0.47	0.50	613	0.00	1.00	0.51	0.50	1370	0.00	1.00	0.45	0.50	4.53	.033	.00
Smoking frequency	259	1.00	3.00	1.28	0.53	79	1.00	3.00	1.29	0.54	180	1.00	3.00	1.27	0.53	0.07	.793	.00
Ever vaped	1985	0.00	1.00	0.20	0.40	614	0.00	1.00	0.26	0.44	1371	0.00	1.00	0.18	0.38	16.82	<.001	.01
Vaping frequency	79	1.00	4.00	3.10	1.14	36	2.00	4.00	3.50	0.78	43	1.00	4.00	2.77	1.29	9.71	.003	.10
Ever used cannabis	1970	0.00	1.00	0.46	0.50	609	0.00	1.00	0.54	0.50	1361	0.00	1.00	0.42	0.49	22.70	<.001	.01
Cannabis smoking frequency	116	1.00	5.00	1.58	0.89	50	1.00	5.00	1.74	1.01	66	1.00	5.00	1.45	0.77	2.79	.098	.03
Conduct problems	1989	0.00	7.00	1.46	1.17	615	0.00	6.00	1.43	1.07	1374	0.00	7.00	1.47	1.21	0.43	.513	.00
Emotional problems	1989	0.00	10.00	3.06	2.61	615	0.00	10.00	2.09	2.33	1374	0.00	10.00	3.49	2.62	141.97	<.001	.06
Hyperactivity	1989	0.00	10.00	4.08	2.19	615	0.00	10.00	4.00	2.31	1374	0.00	10.00	4.12	2.14	1.20	.273	.00
Peer problems	1989	0.00	10.00	2.21	1.65	615	0.00	10.00	2.36	1.58	1374	0.00	9.00	2.14	1.68	8.02	.005	.00
Prosocial behaviour	1989	0.00	10.00	6.95	2.03	615	0.00	10.00	6.17	2.09	1374	1.00	10.00	7.30	1.89	131.69	<.001	.07

General anxiety	1989	0.00	40.00	8.50	7.39	615	0.00	37.00	6.19	6.47	1374	0.00	40.00	9.53	7.54	101.61	<.001	.04
Depression	1989	0.00	16.00	4.20	3.89	615	0.00	16.00	3.33	3.36	1374	0.00	16.00	4.59	4.04	52.86	<.001	.02
Self-harm	1968	0.00	4.00	0.04	0.24	605	0.00	4.00	0.02	0.21	1363	0.00	4.00	0.04	0.26	4.93	.027	.00
Physical activity	1986	1.00	5.00	2.66	1.10	615	1.00	5.00	2.61	1.12	1371	1.00	5.00	2.68	1.09	1.90	.169	.00
Media use	1986	0.00	15.00	6.98	2.32	615	0.00	15.00	7.21	2.45	1371	0.00	14.00	6.87	2.24	8.34	.004	.00
Volunteering	1986	0.00	8.00	1.10	1.30	615	0.00	8.00	1.00	1.27	1371	0.00	8.00	1.15	1.31	5.95	.015	.00

[a] *F and p values are reported with Welch's correction (Welch, 1951) as the assumption of homogeneity of variance was violated for several variables.*

Supplementary Table 9. Descriptive statistics for T1 to T2 differences for twin two randomly selected from each pair.

Construct	**All**						**Males**						**Females**						**ANOVA**[a]		
	N	Min	Max	*M*	*SD*	*d*	*n*	Min	Max	*M*	*SD*	*d*	*n*	Min	Max	*M*	*SD*	d	Sex	*p*	R^2
Love and relationships	1853	-4.00	4.00	0.07	1.20	0.06	573	-3.33	4.00	0.13	1.24	0.10	1280	-4.00	4.00	0.04	1.19	0.04	1.93	.165	.00
Verbal peer victimisation	1778	-8.00	8.00	-1.44	2.44	0.59	536	-8.00	8.00	-1.70	2.68	0.63	1242	-8.00	8.00	-1.33	2.31	0.57	7.68	.006	.00
Cyber peer victimisation	1778	-8.00	8.00	-0.40	1.31	0.30	536	-8.00	8.00	-0.34	1.36	0.25	1242	-8.00	6.00	-0.42	1.28	0.33	1.43	.232	.00
Physical peer victimisation	1776	-7.00	5.00	-0.17	0.84	0.21	535	-6.00	5.00	-0.35	1.18	0.29	1241	-7.00	3.00	-0.10	0.62	0.15	21.78	<.001	.02

Achievement motivation	1875	-14.00	10.00	-1.52	2.93	0.52	577	-12.00	10.00	-1.35	2.97	0.46	1298	-14.00	8.00	-1.59	2.91	0.55	2.60	.107	.00
Importance of Relationships	1875	-16.00	13.00	-0.61	3.06	0.20	576	-13.00	10.00	-0.50	3.38	0.15	1299	-16.00	13.00	-0.66	2.91	0.23	0.95	.330	.00
Purpose in Life	1879	-2.40	2.80	0.04	0.67	0.06	579	-2.20	2.40	0.09	0.70	0.12	1300	-2.40	2.80	0.02	0.65	0.03	3.45	.064	.00
Healthcare	1877	-4.00	4.00	0.21	0.73	0.28	578	-4.00	4.00	0.26	0.80	0.32	1299	-4.00	4.00	0.18	0.70	0.26	3.57	.059	.00
Community satisfaction	1873	-3.00	3.60	-0.07	0.76	0.10	574	-2.80	2.20	-0.05	0.74	0.07	1299	-3.00	3.60	-0.08	0.77	0.11	0.69	.406	.00
Attitudes towards money	1823	-4.00	4.00	0.16	1.02	0.15	555	-4.00	4.00	0.09	1.16	0.07	1268	-3.00	3.00	0.19	0.94	0.20	3.15	.076	.00
Alcohol frequency	1715	-4.00	4.00	0.20	1.05	0.19	518	-4.00	3.00	0.06	1.04	0.05	1197	-4.00	4.00	0.26	1.05	0.25	14.25	<.001	.01
Alcohol quantity	1403	-4.00	4.00	-0.56	1.45	0.39	432	-4.00	4.00	-0.51	1.48	0.34	971	-4.00	4.00	-0.58	1.43	0.41	0.78	.378	.00
Alcohol (frequency x quantity)	1714	-16.00	16.00	-0.58	4.00	0.14	517	-16.00	13.00	-0.76	4.29	0.18	1197	-16.00	16.00	-0.50	3.87	0.13	1.46	.228	.00
Ever smoked	1788	-1.00	1.00	-0.08	0.37	0.22	539	-1.00	1.00	-0.06	0.34	0.19	1249	-1.00	1.00	-0.09	0.38	0.24	2.15	.143	.00
Smoking frequency	154	-1.00	2.00	0.04	0.55	0.07	48	-1.00	1.00	0.02	0.64	0.03	106	-1.00	2.00	0.05	0.50	0.09	0.06	.801	.00
Ever vaped	1791	-1.00	1.00	-0.04	0.36	0.12	540	-1.00	1.00	-0.06	0.38	0.16	1251	-1.00	1.00	-0.03	0.35	0.10	1.95	.163	.00

Vaping frequency	52	-5.00	3.00	-0.67	2.02	0.33	23	-4.00	3.00	-0.70	1.77	0.39	29	-5.00	3.00	-0.66	2.22	0.29	0.01	.942	.00
Ever used cannabis	1757	-1.00	1.00	-0.02	0.34	0.05	528	-1.00	1.00	-0.02	0.33	0.06	1229	-1.00	1.00	-0.02	0.35	0.04	0.04	.841	.00
Cannabis smoking frequency	74	-2.00	4.00	-0.07	0.96	0.07	33	-2.00	4.00	0.15	1.20	0.13	41	-2.00	1.00	-0.24	0.66	0.37	2.87	.097	.04
Conduct problems	1858	-8.00	6.00	-0.01	1.43	0.01	571	-8.00	4.00	-0.16	1.44	0.11	1287	-6.00	6.00	0.06	1.43	0.04	8.99	.003	.00
Emotional problems	1858	-9.00	10.00	-0.55	2.51	0.22	571	-8.00	7.00	-0.69	2.38	0.29	1287	-9.00	10.00	-0.48	2.57	0.19	2.80	.095	.00
Hyperactivity	1858	-7.00	9.00	1.01	2.31	0.43	571	-7.00	7.00	0.72	2.34	0.31	1287	-6.00	9.00	1.13	2.29	0.49	12.52	<.001	.01
Peer problems	1858	-7.00	5.00	0.09	1.62	0.06	571	-5.00	5.00	0.29	1.63	0.18	1287	-7.00	5.00	0.01	1.61	0.00	11.97	.001	.01
Prosocial behaviour	1858	-8.00	8.00	-0.81	1.96	0.41	571	-8.00	8.00	-1.00	2.09	0.48	1287	-8.00	6.00	-0.73	1.89	0.39	6.86	.009	.00
General anxiety	1789	-31.00	37.00	1.04	6.75	0.15	537	-24.00	29.00	0.36	5.57	0.06	1252	-31.00	37.00	1.33	7.18	0.18	9.48	.002	.00
Depression	1857	-15.00	15.00	-0.19	3.87	0.05	571	-13.00	14.00	-0.54	3.57	0.15	1286	-15.00	15.00	-0.04	3.98	0.01	7.19	.007	.00
Self-harm	1771	-4.00	2.00	-0.15	0.62	0.24	529	-4.00	1.00	-0.11	0.52	0.20	1242	-4.00	2.00	-0.17	0.66	0.26	4.63	.032	.00
Physical activity	1852	-3.83	3.50	-0.15	1.11	0.14	566	-3.83	3.50	-0.36	1.13	0.31	1286	-3.67	3.33	-0.06	1.09	0.06	26.55	<.001	.01
Media use	1845	-10.00	8.00	-0.62	2.25	0.27	563	-10.00	8.00	-0.80	2.32	0.35	1282	-10.00	8.00	-0.54	2.22	0.24	5.29	.022	.00
Volunteering	1854	-8.00	7.00	-1.86	2.15	0.86	571	-8.00	6.00	-1.83	2.12	0.86	1283	-8.00	7.00	-1.87	2.17	0.86	0.10	.753	.00

[a] F and p values are reported with Welch's correction (Welch, 1951) as the assumption of homogeneity of variance was violated for several variables.

Supplementary Table 10. Phenotypic correlations between T1 and T2 for the whole sample and split by males and females.

Construct	All			Males			Females		
	r	*p*	*n*	*r*	*p*	*n*	*r*	*p*	*n*
Love and relationships	.43	<.001	1832	.42	<.001	539	.43	<.001	1293
Achievement motivation	.61	<.001	1872	.66	<.001	551	.58	<.001	1321
Importance of Relationships	.61	<.001	1872	.58	<.001	551	.63	<.001	1321
Purpose in Life	.68	<.001	1871	.69	<.001	551	.67	<.001	1320
Healthcare	.31	<.001	1869	.39	<.001	550	.27	<.001	1319
Community satisfaction	.43	<.001	1865	.44	<.001	551	.42	<.001	1314
Attitudes towards money	.39	<.001	1831	.41	<.001	546	.38	<.001	1285
Alcohol (frequency x quantity)	.44	<.001	1700	.49	<.001	490	.42	<.001	1210
Conduct problems	.32	<.001	1838	.30	<.001	545	.33	<.001	1293
Emotional problems	.56	<.001	1838	.59	<.001	545	.55	<.001	1293
Hyperactivity	.45	<.001	1838	.49	<.001	545	.43	<.001	1293
Peer problems	.58	<.001	1838	.54	<.001	545	.59	<.001	1293
Prosocial behaviour	.46	<.001	1838	.49	<.001	545	.45	<.001	1293
General anxiety	.57	<.001	1774	.57	<.001	513	.58	<.001	1261
Depression	.56	<.001	1837	.55	<.001	545	.56	<.001	1292
Physical activity	.47	<.001	1846	.51	<.001	545	.45	<.001	1301
Media use	.47	<.001	1841	.57	<.001	545	.43	<.001	1296
Volunteering	.29	<.001	1837	.29	<.001	545	.29	<.001	1292

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 11. Measures, test-retest reliabilities and references.

Theme	Variable Name	Scale/item[a]	No. of items	Test-retest[b]	Reference[c]
Crisis questionnaire	Multiple items	Items about home environment, life changes, and physical health	41	-	Adapted from the The CoRonavIruS Health Impact Survey (CRISIS; https://github.com/nimh-mbdu/CRISIS)
Relationships	Love and relationships	CLAS - Love and Relationships	3	0.71	Lavallee, Hatch, Michalos, and McKinley (2007)
	Verbal peer victimisation	Peer victimisation	4	Kept original scale	Mynard, H., and Joseph (2000)
	Cyber peer victimisation	Peer victimisation	4	Kept original scale	Mynard, H., and Joseph (2000)
	Physical peer victimisation	Peer victimisation	4	Kept original scale	Mynard, H., and Joseph (2000)
Thoughts and attitudes	Importance of Relationships	GOALS - self-fulfillment	5	0.73	Pöhlmann and Brunstein (1997)
	Achievement Motivation	GOALS - relationships	4	0.69	Pöhlmann and Brunstein (1997)
	Purpose in Life	Purpose in Life	5	0.82	Crumbaugh and Maholick (1964)
	Healthcare	BSA Democracy and Government (single item about attitudes towards universal healthcare)	1	0.47	Taken from the NatCen Social Research's British Social Attitudes (BSA) Survey (http://natcen.ac.uk/our-research/research/british-social-attitudes/).
	Community satisfaction	CLAS Life Satisfaction Scale - Community.	5	0.5	Lavallee, Hatch, Michalos, and McKinley (2007)

	Attitudes towards money	OECD Financial Literacy: General Money Attitude and Behaviour	1	0.73	Adapted from sections of the OECD instrument for measuring financial literacy: https://www.oecd.org/finance/financial-education/49319977.pdf
Substance use	Alcohol frequency	Alcohol use	1	0.71	Adapted from items 1-10 of the AUDIT scale: https://www.drugabuse.gov/sites/default/files/files/AUDIT.pdf
	Alcohol quantity	Alcohol use	1	0.71	Adapted from items 1-10 of the AUDIT scale: https://www.drugabuse.gov/sites/default/files/files/AUDIT.pdf
	Alcohol (frequency x quantity)	Alcohol use	1	0.71	Adapted from items 1-10 of the AUDIT scale: https://www.drugabuse.gov/sites/default/files/files/AUDIT.pdf
	Ever smoked [d]	Smoking (inc. vaping)	1	0.67	Adapted from Heatherton, Kozlowski, Frecker, and Fagerstrom (1991)
	Smoking frequency [d]	Smoking (inc. vaping)	1	0.67	Adapted from Heatherton, Kozlowski, Frecker, and Fagerstrom (1991)
	Ever vaped [d]	Smoking (inc. vaping)	1	0.67	Adapted from Heatherton, Kozlowski, Frecker, and Fagerstrom (1991)
	Vaping frequency [d]	Smoking (inc. vaping)	1	0.67	Adapted from Heatherton, Kozlowski, Frecker, and Fagerstrom (1991)
	Ever used cannabis [d]	Cannabis use	1	Kept original scale	Legleye, Piontek, and Kraus, (2011)
	Cannabis smoking frequency [d]	Cannabis use	1	Kept original scale	Legleye, Piontek, and Kraus, (2011)
Wellbeing	Conduct problems	SDQ - Conduct problems	5	0.7	Goodman (1997)
	Emotional problems	SDQ - Emotional problems	5	0.8	Goodman (1997)
	Hyperactivity	SDQ - Hyperactivity	5	0.71	Goodman (1997)

	Peer problems	SDQ - Peer problems	5	0.8	Goodman (1997)
	Prosocial behaviour	SDQ - Prosocial behaviour	5	-	Goodman (1997)
	General anxiety	General Anxiety: the Severity Measure for Generalized Anxiety Disorder	10	Kept the original scale	Craske et al. (2013)
	Depression	Short Mood and Feeling Questionnaire (SMFQ)	8	Kept the original scale	Angold et al. (1995)
	Self-harm	CASE - Self-harm	1	0.56	Adapted from Madge et al. (2008)
	Physical activity	Activity questionnaire	3	Kept the original scale	Questions devised by TEDS researchers.
Behaviours	Media use	Media and Technology Usage and Attitudes Scale	4	.73 (video games sub-scale) .82 (social media sub-scale)	Rosen, Whaling, Carrier, Cheever, & Rokkum (2013)
	Volunteering	Volunteering	3	.84	Adapted from page 42 of the ALSPAC questionnaire "It's all about you" at age 20: http://www.bristol.ac.uk/media-library/sites/alspac/migrated/documents/ques-yp20-all-about-you.pdf

[a] More information about the variables and the references can be found in the TEDS data dictionary (**http://www.teds.ac.uk/datadictionary/studies/measures/21yr_measures.htm**).

[b] Test-retest reliability figures are from T1 questionnaire construction.

[c] Note that measures were shortened and adapted from the referenced measures.

[d] Smoking and vaping measures were not included in the present analyses because too few twins endorsed them.

Supplementary Table 12. Twin intraclass correlations and Falconer ACE estimates.

Construct	T1								
	MZ			DZ			Falconer ACE estimates		
	r	*p*	*n*	*r*	*p*	*n*	A	C	E
Love and relationships	.19	<.001	929	.08	.005	1351	.19	.00	.81
Achievement motivation	.37	<.001	923	.16	<.001	1361	.37	.00	.63
Importance of Relationships	.42	<.001	923	.10	<.001	1361	.42	.00	.58
Purpose in Life	.38	<.001	922	.21	<.001	1361	.34	.05	.62
Healthcare	.36	<.001	922	.16	<.001	1354	.36	.00	.65
Community satisfaction	.42	<.001	926	.35	<.001	1339	.14	.28	.58
Attitudes towards money	.26	<.001	894	.05	.059	1274	.26	.00	.74
Alcohol (frequency x quantity)	.36	<.001	793	.15	<.001	1139	.36	.00	.64
Conduct problems	.28	<.001	901	.12	<.001	1331	.28	.00	.72
Emotional problems	.36	<.001	901	.18	<.001	1331	.34	.01	.65
Hyperactivity	.39	<.001	901	.16	<.001	1331	.39	.00	.61
Peer problems	.39	<.001	901	.24	<.001	1331	.30	.09	.61
Prosocial behaviour	.28	<.001	901	.11	<.001	1331	.28	.00	.72
General anxiety	.38	<.001	847	.14	<.001	1214	.38	.00	.63
Depression	.35	<.001	901	.18	<.001	1331	.33	.02	.65
Physical activity	.41	<.001	918	.18	<.001	1325	.41	.00	.59
Media use	.41	<.001	918	.18	<.001	1325	.41	.00	.59
Volunteering	.35	<.001	900	.13	<.001	1331	.35	.00	.65

Note: MZ=monozygotic; DZ=dizygotic; and genetic (A), shared environmental (C) and non-shared environmental (E) estimates. Scores were corrected for mean age and sex differences (see Methods). ACE estimates were derived from the intraclass twin correlations using Falconer's formula (Rijsdijk & Sham, 2002).

Supplementary Table 13. Twin intraclass correlations and Falconer ACE estimates.

Construct	T2								
	MZ			DZ			Falconer ACE estimates		
	r	*p*	*n*	*r*	*p*	*n*	A	C	E
Love and relationships	.25	<.001	530	.07	.077	600	.25	.00	.75
Achievement motivation	.39	<.001	548	.17	<.001	625	.39	.00	.61
Importance of Relationships	.39	<.001	548	.14	.001	625	.39	.00	.61
Purpose in Life	.43	<.001	552	.27	<.001	625	.32	.11	.57
Healthcare	.20	<.001	552	.13	.001	625	.14	.06	.80
Community satisfaction	.29	<.001	552	.11	.005	625	.29	.00	.71
Attitudes towards money	.19	<.001	552	.04	.304	625	.19	.00	.81
Alcohol (frequency x quantity)	.39	<.001	550	.23	<.001	620	.32	.07	.61
Conduct problems	.17	<.001	550	.18	<.001	620	.00	.17	.83
Emotional problems	.39	<.001	550	.20	<.001	620	.38	.01	.61
Hyperactivity	.36	<.001	550	.09	.027	620	.36	.00	.64
Peer problems	.42	<.001	550	.23	<.001	620	.38	.04	.58
Prosocial behaviour	.35	<.001	550	.19	<.001	620	.32	.03	.65
General anxiety	.42	<.001	550	.19	<.001	620	.42	.00	.58
Depression	.38	<.001	550	.18	<.001	620	.38	.00	.62
Physical activity	.40	<.001	549	.27	<.001	620	.26	.14	.60
Media use	.49	<.001	549	.14	.001	620	.49	.00	.51
Volunteering	.38	<.001	549	.09	.023	620	.38	.00	.62

Note: MZ=monozygotic; DZ=dizygotic; and genetic (A), shared environmental (C) and non-shared environmental (E) estimates. Scores were corrected for mean age and sex differences (see Methods). ACE estimates were derived from the intraclass twin correlations using Falconer's formula (Rijsdijk & Sham, 2002).

Supplementary Table 14. Twin intraclass correlations and Falconer ACE estimates.

Construct	T2 change								
	MZ			DZ			Falconer ACE estimates		
	r	*p*	*n*	*r*	*p*	*n*	A	C	E
Love and relationships	.17	<.001	482	.05	.305	530	.17	.00	.83
Achievement motivation	.16	<.001	492	.06	.168	544	.16	.00	.84
Importance of Relationships	.12	.010	492	.00	.997	544	.12	.00	.88
Purpose in Life	.13	.003	495	.12	.007	544	.02	.11	.87
Healthcare	.11	.018	495	.07	.099	543	.08	.03	.89
Community satisfaction	.20	<.001	499	-.03	.482	547	.20	.00	.80
Attitudes towards money	.12	.008	488	-.01	.914	521	.12	.00	.88
Alcohol (frequency x quantity)	.22	<.001	446	.03	.505	476	.22	.00	.78
Conduct problems	.14	.003	484	.12	.005	538	.04	.10	.86
Emotional problems	.25	<.001	484	.06	.194	538	.25	.00	.75
Hyperactivity	.20	<.001	484	.09	.036	538	.20	.00	.80
Peer problems	.19	<.001	484	.08	.066	538	.19	.00	.81
Prosocial behaviour	.15	.001	484	.13	.003	538	.04	.11	.85
General anxiety	.25	<.001	475	.10	.021	513	.25	.00	.75
Depression	.13	.003	484	.08	.062	538	.10	.03	.87
Physical activity	.25	<.001	493	.17	<.001	538	.16	.09	.75
Media use	.32	<.001	493	.05	.244	534	.32	.00	.68
Volunteering	.31	<.001	483	.07	.106	538	.31	.00	.69

Note: MZ=monozygotic; DZ=dizygotic; and genetic (A), shared environmental (C) and non-shared environmental (E) estimates. Scores were corrected for mean age and sex differences (see Methods). ACE estimates were derived from the intraclass twin correlations using Falconer's formula (Rijsdijk & Sham, 2002).

Supplementary Table 15. Whole sample model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance for variables (95% confidence intervals in parentheses).

Construct	**T1**			**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**	**A**	**C**	**E**
Love and relationships	.18 (.07-.24)	.00 (.00-.00)	.82 (.76-.87)	.23 (.09-.30)	.00 (.00-.00)	.77 (.70-.85)	.15 (.00-.23)	.00 (.00-.13)	.85 (.77-.92)
Achievement motivation	.36 (.26-.41)	.00 (.00-.00)	.64 (.59-.69)	.38 (.21-.44)	.00 (.00-.13)	.62 (.56-.68)	.15 (.07-.23)	.00 (.00-.14)	.85 (.77-.93)
Importance of Relationships	.38 (.32-.43)	.00 (.00-.02)	.62 (.57-.67)	.35 (.21-.41)	.00 (.00-.11)	.65 (.59-.71)	.09 (.05-.17)	.00 (.00-.10)	.91 (.83-.95)
Purpose in Life	.37 (.22-.45)	.03 (.00-.14)	.61 (.55-.66)	.41 (.22-.52)	.05 (.00-.20)	.54 (.48-.61)	.05 (.00-.23)	.09 (.00-.18)	.86 (.77-.93)
Healthcare	.36 (.26-.41)	.00 (.00-.07)	.64 (.59-.69)	.14 (.00-.30)	.08 (.00-.23)	.78 (.70-.87)	.08 (.00-.20)	.03 (.00-.15)	.89 (.80-.97)
Community satisfaction	.13 (.00-.26)	.29 (.18-.39)	.58 (.53-.63)	.29 (.15-.35)	.00 (.00-.10)	.71 (.64-.78)	.14 (.05-.22)	.00 (.00-.06)	.86 (.78-.94)
Attitudes towards money	.22 (.15-.28)	.00 (.00-.04)	.78 (.72-.83)	.16 (.03-.23)	.00 (.00-.00)	.84 (.77-.91)	.09 (.00-.17)	.00 (.00-.09)	.91 (.83-.99)
Alcohol (frequency x quantity)	.35 (.25-.41)	.00 (.00-.00)	.65 (.59-.70)	.40 (.20-.49)	.03 (.00-.18)	.58 (.51-.65)	.19 (.06-.28)	.00 (.00-.09)	.81 (.72-.89)
Conduct problems	.27 (.17-.33)	.00 (.00-.08)	.73 (.67-.78)	.01 (.00-.24)	.19 (.01-.25)	.81 (.72-.87)	.04 (.00-.23)	.10 (.00-.19)	.86 (.77-.93)

Emotional problems	.33 (.18-.40)	.02 (.00-.13)	.65 (.60-.71)	.39 (.20-.45)	.00 (.00-.15)	.61 (.55-.68)	.22 (.10-.30)	.00 (.00-.09)	.78 (.70-.86)
Hyperactivity	.38 (.29-.42)	.00 (.00-.07)	.62 (.58-.67)	.34 (.25-.40)	.00 (.00-.00)	.66 (.60-.73)	.20 (.00-.28)	.00 (.00-.15)	.80 (.72-.87)
Peer problems	.29 (.15-.43)	.09 (.00-.20)	.61 (.56-.67)	.36 (.16-.48)	.06 (.00-.22)	.58 (.52-.65)	.18 (.00-.26)	.00 (.00-.18)	.82 (.74-.90)
Prosocial behaviour	.27 (.15-.32)	.00 (.00-.09)	.73 (.68-.79)	.34 (.14-.42)	.01 (.00-.17)	.64 (.58-.72)	.03 (.00-.23)	.12 (.00-.20)	.85 (.77-.91)
General anxiety	.36 (.28-.41)	.00 (.00-.06)	.64 (.59-.69)	.39 (.20-.45)	.00 (.00-.15)	.61 (.55-.68)	.26 (.11-.33)	.00 (.00-.11)	.74 (.67-.82)
Depression	.29 (.13-.39)	.05 (.00-.16)	.67 (.61-.72)	.39 (.24-.45)	.00 (.00-.12)	.61 (.55-.68)	.12 (.00-.22)	.02 (.00-.16)	.86 (.78-.92)
Physical activity	.40 (.29-.44)	.00 (.00-.08)	.60 (.56-.65)	.30 (.10-.46)	.12 (.00-.27)	.58 (.52-.66)	.17 (.00-.34)	.09 (.00-.26)	.74 (.66-.83)
Media use	.45 (.35-.50)	.00 (.00-.08)	.55 (.50-.60)	.44 (.35-.49)	.00 (.00-.00)	.56 (.51-.62)	.26 (.16-.33)	.00 (.00-.08)	.74 (.67-.81)
Volunteering	.32 (.23-.37)	.00 (.00-.00)	.68 (.63-.73)	.35 (.26-.41)	.00 (.00-.00)	.65 (.59-.72)	.28 (.19-.36)	.00 (.00-.06)	.72 (.64-.79)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 16. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variable in the relationships theme (95% confidence intervals in parentheses).

Trait	A1	A2
Love and relationships	0.183 (0.070,0.236)	
Love and relationships	0.173(0.089,0.305)	0.077 (0.000,0.147)
	C1	C2
Love and relationships	0.000 (0.000,0.082)	
Love and relationships	0.000 (0.000,0.072)	0.000 (0.000,0.071)
	E1	E2
Love and relationships	0.815 (0.749,0.882)	
Love and relationships	0.083 (0.056,0.114)	0.666 (0.595,0.740)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 17. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the thoughts and attitudes theme (95% confidence intervals in parentheses).

(a)		
Trait	A1	A2
Achievement motivation	0.348 (0.245,0.393)	
Achievement motivation	0.328 (0.192,0.407)	0.043 (0.000,0.101)
	C1	C2
Achievement motivation	0.000 (0.000,0.076)	
Achievement motivation	0.000 (0.000,0.137)	0.000 (0.000,0.066)
	E1	E2
Achievement motivation	0.630 (0.573,0.690)	
Achievement motivation	0.092 (0.066,0.122)	0.531 (0.471,0.594)
(b)		
Trait	A1	A2
Importance of relationships	0.376 (0.324,0.422)	
Importance of relationships	0.361 (0.285,0.412)	0.000 (0.000,0.041)
	C1	C2
Importance of relationships	0.000 (0.000,0.027)	
Importance of relationships	0.000 (0.000,0.060)	0.000 (0.000,0.029)
	E1	E2
Importance of relationships	0.626 (0.567,0.688)	
Importance of relationships	0.100 (0.075,0.129)	0.537 (0.488,0.587)
(c)		
Trait	A1	A2
Purpose in life	0.385 (0.250,0.450)	

Purpose in life	0.432 (0.265,0.516)	0.000 (0.000,0.091)
	C1	C2
Purpose in life	0.020 (0.000,0.124)	
Purpose in life	0.001 (0.000,0.154)	0.028 (0.000,0.076)
	E1	E2
Purpose in life	0.602 (0.543,0.665)	
Purpose in life	0.104 (0.077,0.138)	0.436 (0.386,0.490)
(d)		
Trait	A1	A2
Healthcare	0.376 (0.274,0.426)	
Healthcare	0.146 (0.057,0.245)	0.049 (0.000,0.150)
	C1	C2
Healthcare	0.000 (0.000,0.073)	
Healthcare	0.009 (0.000,0.144)	0.010 (0.000,0.114)
	E1	E2
Healthcare	0.678 (0.614,0.745)	
Healthcare	0.019 (0.006,0.039)	0.830 (0.741,0.918)
(e)		
Trait	A1	A2
Community satisfaction	0.128 (0.007,0.255)	
Community satisfaction	0.098 (0.000,0.279)	0.087 (0.000,0.160)
	C1	C2
Community satisfaction	0.284 (0.184,0.378)	
Community satisfaction	0.074 (0.018,0.159)	0.000 (0.000,0.051)
	E1	E2
Community satisfaction	0.566 (0.509,0.628)	
Community satisfaction	0.049 (0.027,0.078)	0.687 (0.613,0.764)
(f)		
Trait	A1	A2
Money attitudes	0.220 (0.150,0.273)	
Money attitudes	0.117 (0.046,0.200)	0.063 (0.000,0.132)
	C1	C2
Money attitudes	0.000 (0.000,0.044)	
Money attitudes	0.000 (0.000,0.098)	0.000 (0.000,0.076)
	E1	E2
Money attitudes	0.782 (0.716,0.849)	
Money attitudes	0.064 (0.040,0.094)	0.754 (0.678,0.833)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 18. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the substance use theme (95% confidence intervals in parentheses).

Trait	A1	A2
Alcohol freq x quant	0.379 (0.261,0.431)	
Alcohol freq x quant	0.257 (0.127,0.337)	0.157 (0.049,0.223)
	C1	C2
Alcohol freq x quant	0.000 (0.000,0.088)	
Alcohol freq x quant	0.000 (0.000,0.139)	0.000 (0.000,0.074)
	E1	E2
Alcohol freq x quant	0.667 (0.602,0.736)	
Alcohol freq x quant	0.042 (0.024,0.066)	0.565 (0.499,0.637)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 19. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the wellbeing theme (95% confidence intervals in parentheses).

(a)		
Trait	A1	A2
Conduct problems	0.308 (0.192,0.363)	
Conduct problems	0.109 (0.016,0.234)	0.000 (0.000,0.157)
	C1	C2
Conduct problems	0.000(0.000,0.083)	
Conduct problems	0.082 (0.000,0.195)	0.016 (0.000,0.150)
	E1	E2
Conduct problems	0.783(0.713,0.855)	
Conduct problems	0.038 (0.018,0.067)	0.798(0.718,0.873)
(b)		
Trait	A1	A2
Emotional problems	0.300 (0.160,0.390)	
Emotional problems	0.253 (0.122,0.403)	0.101 (0.000,0.161)
	C1	C2
Emotional problems	0.041 (0.000,0.147)	
Emotional problems	0.032 (0.000,0.148)	0.000 (0.000,0.065)
	E1	E2
Emotional problems	0.656 (0.594,0.721)	
Emotional problems	0.078 (0.053,0.110)	0.537 (0.476,0.604)
(c)		
Trait	A1	A2
Hyperactivity	0.355 (0.250,0.425)	
Hyperactivity	0.275 (0.165,0.384)	0.050 (0.000,0.185)

	C1	C2
Hyperactivity	0.024 (0.000,0.100)	
Hyperactivity	0.016 (0.000,0.091)	0.000 (0.000,0.080)
	E1	E2
Hyperactivity	0.632 (0.571,0.697)	
Hyperactivity	0.037 (0.020,0.062)	0.626 (0.554,0.702)
(d)		
Trait	A1	A2
Peer problems	0.298 (0.161,0.420)	
Peer problems	0.272 (0.133,0.449)	0.066 (0.000,0.123)
	C1	C2
Peer problems	0.088 (0.000,0.194)	
Peer problems	0.072 (0.000,0.204)	0.000 (0.000,0.085)
	E1	E2
Peer problems	0.603 (0.544,0.666)	
Peer problems	0.069 (0.045,0.099)	0.512 (0.453,0.576)
(e)		
Trait	A1	A2
Prosocial behaviour	0.272 (0.176,0.323)	
Prosocial behaviour	0.327 (0.184,0.419)	0.00 (-0.130,0.125)
	C1	C2
Prosocial behaviour	0.001 (0.000,0.072)	
Prosocial behaviour	0.036 (0.000,0.151)	0.000 (0.000,0.105)
	E1	E2
Prosocial behaviour	0.747 (0.684,0.812)	
Prosocial behaviour	0.042 (0.025,0.065)	0.597 (0.532,0.665)
(f)		
Trait	A1	A2
General anxiety	0.358 (0.271,0.407)	
General anxiety	0.332 (0.235,0.434)	0.108 (0.000,0.169)
	C1	C2
General anxiety	0.000 (0.000,0.061)	
General anxiety	0.000 (0.000,0.091)	0.000 (0.000,0.070)
	E1	E2
General anxiety	0.651 (0.589,0.716)	
General anxiety	0.084 (0.059,0.114)	0.476 (0.418,0.540)
(g)		
Trait	A1	A2
Depression	0.323 (0.202,0.393)	
Depression	0.390 (0.251,0.451)	0.000 (0.000,0.071)
	C1	C2
Depression	0.023 (0.000,0.121)	
Depression	0.004 (0.000,0.106)	0.000 (0.000,0.048)

	E1	E2
Depression	0.654 (0.596,0.714)	
Depression	0.048 (0.030,0.072)	0.560 (0.499,0.623)
(h)		
Trait	A1	A2
Physical activity	0.344 (0.239,0.420)	
Physical activity	0.107 (0.024,0.221)	0.084 (0.000,0.201)
	C1	C2
Physical activity	0.048 (0.002,0.125)	
Physical activity	0.198 (0.038,0.332)	0.000 (0.000,0.130)
	E1	E2
Physical activity	0.623 (0.564,0.687)	
Physical activity	0.056 (0.033,0.084)	0.559 (0.491,0.635)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 20. Bivariate Cholesky decomposition estimating the aetiology of the association between T1 (A1, C1 and E1) and T2 (A2, C2 and E2), for variables in the behaviours theme (95% confidence intervals in parentheses).

(a)		
Trait	A1	A2
Media use	0.454 (0.353,0.496)	
Media use	0.262 (0.192,0.349)	0.178 (0.079,0.236)
	C1	C2
Media use	0.000 (0.000,0.078)	
Media use	0.000 (0.000,0.065)	0.000 (0.000,0.054)
	E1	E2
Media use	0.543 (0.489,0.600)	
Media use	0.031 (0.016,0.051)	0.535 (0.474,0.600)
(b)		
Trait	A1	A2
Volunteering	0.312 (0.209,0.358)	
Volunteering	0.073 (0.039,0.174)	0.255 (0.108,0.321)
	C1	C2
Volunteering	0.000 (0.000,0.076)	
Volunteering	0.00 (-0.060,0.056)	0.000 (0.000,0.055)
	E1	E2
Volunteering	0.659 (0.601,0.720)	
Volunteering	0.025 (0.012,0.044)	0.656 (0.581,0.750)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 21. Bivariate model fit indices

	base	comparison	ep	minus2LL	df	AIC	diffLL	diffdf	p
Healthcare	Sat	<NA>	28	24260.62	8959	6342.62200			
Healthcare	Sat	ACE	11	24354.20	8976	6402.19600	93.57320	17<.00100	0.00000
Community satisfaction	Sat	<NA>	28	24346.90	8931	6484.90300			
Community satisfaction	Sat	ACE	11	24361.32	8948	6465.32100	14.41835	17<.00100	0.63730
Achievement motivation	Sat	<NA>	28	23717.14	8962	5793.14300			
Achievement motivation	Sat	ACE	11	23748.20	8979	5790.20400	31.06116	17<.00100	0.01963
Importance of relationships	Sat	<NA>	28	23417.91	8963	5491.91400			
Importance of relationships	Sat	ACE	11	23476.18	8980	5516.18100	58.26745	17<.00100	0.00000
Depression	Sat	<NA>	28	23671.89	8888	5895.89200			
Depression	Sat	ACE	11	23720.46	8905	5910.45700	48.56479	17<.00100	0.00007
Money attitudes	Sat	<NA>	28	24400.41	8810	6780.41400			
Money attitudes	Sat	ACE	11	24418.71	8827	6764.70700	18.29351	17<.00100	0.37055
Purpose in life	Sat	<NA>	28	23004.94	8966	5072.93500			
Purpose in life	Sat	ACE	11	23034.71	8983	5068.71400	29.77842	17<.00100	0.02799
Love and relationships	Sat	<NA>	28	24420.83	8883	6654.82800			
Love and relationships	Sat	ACE	11	24434.09	8900	6634.08700	13.25833	17<.00100	0.71873
Conduct problems	Sat	<NA>	28	24185.75	8891	6403.75000			
Conduct problems	Sat	ACE	11	24207.22	8908	6391.21600	21.46592	17<.00100	0.20614
Hyperactivity	Sat	<NA>	28	24153.29	8891	6371.29500			
Hyperactivity	Sat	ACE	11	24191.58	8908	6375.58100	38.28626	17<.00100	0.00224
Peer problems	Sat	<NA>	28	36520.94	13526	9468.94000			
Peer problems	Sat	ACE	11	23575.74	8908	5759.74100	13.34099	17<.00100	0.71308
Prosocial behaviour	Sat	<NA>	28	24161.20	8891	6379.19900			
Prosocial behaviour	Sat	ACE	11	24177.12	8908	6361.12100	15.92163	17<.00100	0.52940
Alcohol freq x quant	Sat	<NA>	28	22728.22	8451	5826.21600			
Alcohol freq x quant	Sat	ACE	11	22755.08	8468	5819.07900	26.86278	17<.00100	0.06011

General anxiety	Sat	<NA>	28	22822.96	8633	5556.95900			
General anxiety	Sat	ACE	11	22867.06	8650	5567.06300	44.10331	17<.00100	0.00033
Physical activity	Sat	<NA>	28	23956.38	8879	6198.38100			
Physical activity	Sat	ACE	11	23977.79	8896	6185.79100	21.40986	17<.00100	0.20849
Media use	Sat	<NA>	28	23833.70	8862	6109.69600			
Media use	Sat	ACE	11	23855.84	8879	6097.84000	22.14444	17<.00100	0.17923
Volunteering	Sat	<NA>	28	24837.20	8883	7071.20100			
Volunteering	Sat	ACE	11	24864.09	8900	7064.08800	26.88685	17<.00100	0.05975
Emotional problems	Sat	<NA>	28	23762.35	8891	5980.35500			
Emotional problems	Sat	ACE	11	23781.53	8908	5965.53100	19.17643	17<.00100	0.31850

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 22. For twins living together: T1 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	**T1**											
	MZ DZ combined			MZ			DZ					
	r	*p*	*n*	*r*	*p*	*n*	*r*	*p*	*n*	A	C	E
Love and relationships	.14	.011	312	.18	.008	219	-.03	.713	218	.18(.07-.24)	.00(.00-.00)	.82(.76-.87)
Achievement motivation	.25	<.001	331	.47	<.001	219	.14	.046	219	.36(.26-.41)	.00(.00-.00)	.64(.59-.69)
Importance of Relationships	.25	<.001	331	.47	<.001	219	.07	.304	219	.38(.32-.43)	.00(.00-.02)	.62(.57-.67)

Purpose in Life	.32	<.001	332	.39	<.001	218	.27	<.001	219	.37(.22-.45)	.03(.00-.14)	.61(.55-.66)
Healthcare	.25	<.001	332	.37	<.001	217	.30	<.001	216	.36(.26-.41)	.00(.00-.07)	.64(.59-.69)
Community satisfaction	.41	<.001	332	.46	<.001	218	.37	<.001	218	.13(.00-.26)	.29(.18-.39)	.58(.53-.63)
Attitudes towards money	.18	.001	332	.35	<.001	213	.07	.289	208	.22(.15-.28)	.00(.00-.04)	.78(.72-.83)
Alcohol (frequency x quantity)	.41	<.001	331	.30	<.001	428	.14	<.001	623	.35(.25-.41)	.00(.00-.00)	.65(.59-.70)
Conduct problems	.18	.001	330	.30	<.001	470	.16	<.001	726	.27(.17-.33)	.00(.00-.08)	.73(.67-.78)
Emotional problems	.37	<.001	330	.38	<.001	209	.16	.016	216	.33(.18-.40)	.02(.00-.13)	.65(.60-.71)
Hyperactivity	.25	<.001	330	.48	<.001	209	.17	.011	216	.38(.29-.42)	.00(.00-.07)	.62(.58-.67)
Peer problems	.43	<.001	330	.33	<.001	470	.25	<.001	726	.29(.15-.43)	.09(.00-.20)	.61(.56-.67)
Prosocial behaviour	.24	<.001	330	.30	<.001	470	.12	.001	726	.27(.15-.32)	.00(.00-.09)	.73(.68-.79)
General anxiety	.35	<.001	330	.33	<.001	207	.24	<.001	213	.36(.28-.41)	.00(.00-.06)	.64(.59-.69)
Depression	.34	<.001	330	.32	<.001	470	.17	<.001	726	.29(.13-.39)	.05(.00-.16)	.67(.61-.72)
Physical activity	.38	<.001	329	.55	<.001	218	.21	.002	215	.40(.29-.44)	.00(.00-.08)	.60(.56-.65)
Media use	.44	<.001	329	.64	<.001	217	.29	<.001	209	.45(.35-.50)	.00(.00-.08)	.55(.50-.60)
Volunteering	.28	<.001	329	.42	<.001	209	.21	.002	216	.32(.23-.37)	.00(.00-.00)	.68(.63-.73)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 23. For twins living together: T2 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	**T2**											
	MZ DZ combined			MZ			DZ					
	r	*p*	*n*	*r*	*p*	*n*	*r*	*p*	*n*	A	C	E
Love and relationships	.14	.011	312	.24	.002	163	.04	.608	145	.23 (.00-.36)	.00 (NA-.22)	.77 (.64-.91)
Achievement motivation	.25	<.001	331	.37	<.001	176	.10	.215	151	.36 (.23-.47)	.00 (.00-.19)	.64 (.53-.77)
Importance of Relationships	.25	<.001	331	.40	<.001	176	.01	.920	151	.34 (.13-.44)	.00 (NA-.17)	.66 (.56-.78)
Purpose in Life	.32	<.001	332	.36	<.001	177	.29	<.001	151	.21 (.00-.51)	.19 (.00-.42)	.60 (.48-.74)
Healthcare	.25	<.001	332	.14	.068	177	.36	<.001	151	.00 (NA-.25)	.29 (.18-.40)	.71 (.60-.82)
Community satisfaction	.41	<.001	332	.48	<.001	177	.31	<.001	151	.28 (.00-.56)	.18 (.00-.45)	.54 (.44-.65)
Attitudes towards money	.18	.001	332	.33	<.001	177	.01	.943	151	.26 (.06-.38)	.00 (NA-.14)	.74 (.62-.87)
Alcohol (frequency x quantity)	.41	<.001	331	.50	<.001	177	.32	<.001	150	.39 (.07-.62)	.14 (.00-.40)	.47 (.38-.59)
Conduct problems	.18	.001	330	.19	.013	177	.18	.025	149	.08 (NA-.34)	.12 (.00-.28)	.80 (.66-.92)
Emotional problems	.37	<.001	330	.46	<.001	177	.26	.001	149	.40 (.06-.57)	.07 (NA-.29)	.53 (.43-.65)
Hyperactivity	.25	<.001	330	.34	<.001	177	.15	.065	149	.35 (.07-.47)	.00 (NA-.21)	.65 (.53-.78)

Peer problems	.43	<.001	330	.52	<.001	177	.29	<.001	149	.36 (.02-.58)	.14 (.00-.42)	.51 (.41-.61)
Prosocial behaviour	.24	<.001	330	.40	<.001	177	.08	.350	149	.37 (.18-.48)	.00 (.00-.13)	.63 (.52-.76)
General anxiety	.35	<.001	330	.51	<.001	177	.21	.010	149	.53 (.33-.62)	.00 (NA-.15)	.47 (.38-.58)
Depression	.34	<.001	330	.43	<.001	177	.22	.007	149	.46 (.14-.56)	.00 (.00-.26)	.54 (.44-.65)
Physical activity	.38	<.001	329	.40	<.001	176	.34	<.001	149	.17 (.00-.50)	.25 (.00-.45)	.58 (.47-.70)
Media use	.44	<.001	329	.58	<.001	176	.26	.001	149	.54 (.22-.63)	.01 (.00-.28)	.45 (.37-.55)
Volunteering	.28	<.001	329	.40	<.001	176	.13	.124	149	.38 (.12-.49)	.00 (.00-.20)	.62 (.51-.74)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 24. For twins living together: T2 change twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	**T2 change**											
	MZ DZ combined			MZ			DZ					
	r	*p*	*n*	*r*	*p*	*n*	*r*	*p*	*n*	A	C	E
Love and relationships	.09	.142	282	.20	.017	150	-.04	.678	129	.15 (.00-.29)	.00 (NA-.17)	.85 (.71-.99)
Achievement motivation	.09	.137	293	.17	.037	160	-.04	.680	130	.12 (.00-.26)	.00 (.00-.16)	.88 (.74-1.00)
Importance of Relationships	.05	.388	293	.18	.025	160	-.11	.218	130	.11 (NA-.24)	.00 (NA-.13)	.89 (.76-NA)

Purpose in Life	.16	.007	293	.14	.080	160	.17	.053	130	.01 (.00-.31)	.15 (.00-.26)	.85 (.69-.96)
Healthcare	.17	.003	292	.05	.573	159	.27	.002	130	.00 (NA-.25)	.18 (.00-.30)	.82 (.70-.94)
Community satisfaction	.20	<.001	294	.28	<.001	160	.08	.345	131	.26 (.00-.38)	.00 (.00-.28)	.74 (.62-.88)
Attitudes towards money	.17	.003	286	.30	<.001	156	.03	.738	127	.25 (.01-.38)	.00 (.00-.19)	.75 (.62-.89)
Alcohol (frequency x quantity)	.19	.003	254	.20	.022	135	.20	.035	117	.09 (NA-.38)	.13 (.00-.31)	.78 (.62-.93)
Conduct problems	.16	.008	288	.14	.087	156	.19	.032	129	.00 (NA-.30)	.16 (.00-.27)	.84 (.73-.96)
Emotional problems	.22	<.001	288	.32	<.001	156	.10	.256	129	.30 (.00-.42)	.00 (NA-.25)	.70 (.58-.84)
Hyperactivity	.16	.006	288	.21	.008	156	.10	.242	129	.22 (.00-.36)	.00 (NA-.25)	.78 (.64-.93)
Peer problems	.18	.003	288	.23	.004	156	.08	.378	129	.22 (.00-.35)	.00 (NA-.28)	.78 (.65-.92)
Prosocial behaviour	.13	.028	288	.23	.005	156	.04	.656	129	.19 (.00-.33)	.00 (NA-.19)	.81 (.67-.95)
General anxiety	.24	<.001	289	.38	<.001	154	.11	.215	132	.36 (.14-.49)	.00 (.00-.15)	.64 (.51-.78)
Depression	.21	<.001	288	.28	<.001	156	.11	.200	129	.27 (.00-.40)	.00 (.00-.25)	.73 (.60-.86)
Physical activity	.21	<.001	289	.22	.005	159	.18	.038	127	.12 (.00-.39)	.12 (.00-.32)	.75 (.61-.90)
Media use	.29	<.001	285	.39	<.001	158	.15	.089	124	.38 (.07-.49)	.00 (.00-.24)	.62 (.51-.75)
Volunteering	.18	.002	287	.25	.002	155	.12	.189	129	.25 (.00-.38)	.00 (NA-.23)	.75 (.62-.90)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 25. For twins living apart: T1 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	**T1**											
	MZ DZ combined			MZ			DZ					
	r	p	n	r	p	n	r	p	n	A	C	E
Love and relationships	.13	<.001	810	.16	.001	482	.08	.032	736	0.16 (.00-.23)	.00 (.00-.15)	.84 (.77-.92)
Achievement motivation	.29	<.001	833	.32	<.001	483	.19	<.001	739	0.24 (.03-.39)	.08 (.00-.23)	.68 (.61-.76)
Importance of Relationships	.26	<.001	833	.44	<.001	483	.14	<.001	739	0.41 (.34-.47)	.00 (.00-.05)	.59 (.53-.66)
Purpose in Life	.34	<.001	836	.37	<.001	483	.23	<.001	739	0.32 (.12-.46)	.06 (.00-.21)	.61 (.54-.69)
Healthcare	.12	.001	836	.37	<.001	484	.17	<.001	737	0.37 (.22-.44)	.00 (.00-.11)	.63 (.56-.70)
Community satisfaction	.14	<.001	836	.41	<.001	480	.37	<.001	730	0.13 (.00-.31)	.30 (.16-.42)	.57 (.51-.65)
Attitudes towards money	.09	.012	836	.26	<.001	463	.03	.420	692	0.21 (.14-.28)	.00 (.00-.06)	.79 (.72-.86)
Alcohol (frequency x quantity)	.25	<.001	831	.34	<.001	184	.17	.003	324	0.35 (.14-.42)	.00 (.00-.15)	.65 (.58-.73)
Conduct problems	.15	<.001	831	.18	.006	222	.05	.302	389	0.28 (.07-.37)	.01 (.00-.17)	.70 (.63-.79)
Emotional problems	.24	<.001	831	.33	<.001	470	.16	<.001	726	0.33 (.12-.40)	.00 (.00-.15)	.67 (.60-.74)
Hyperactivity	.20	<.001	831	.33	<.001	470	.14	<.001	726	0.33 (.18-.40)	.00 (.00-.10)	.67 (.60-.74)

Peer problems	.29	<.001	831	.38	<.001	222	.20	<.001	389	0.20 (.00-.40)	.14 (.00-.29)	.66 (.58-.74)
Prosocial behaviour	.29	<.001	831	.24	<.001	222	.05	.341	389	0.29 (.10-.36)	.00 (NA-.14)	.71 (.64-.79)
General anxiety	.27	<.001	831	.34	<.001	446	.12	.003	666	0.32 (.24-.39)	.00 (.00-.08)	.68 (.61-.76)
Depression	.24	<.001	831	.37	<.001	222	.19	<.001	389	0.28 (.07-.39)	.03 (.00-.19)	.68 (.61-.77)
Physical activity	.31	<.001	831	.36	<.001	475	.17	<.001	723	0.36 (.29-.43)	.00 (.00-.14)	.64 (.57-.71)
Media use	.27	<.001	831	.42	<.001	475	.19	<.001	723	0.42 (.27-.48)	.00 (.00-.11)	.58 (.52-.65)
Volunteering	.20	<.001	831	.35	<.001	470	.14	<.001	726	0.32 (.18-.39)	.00 (.00-.11)	.68 (.61-.75)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 26. For twins living apart: T2 twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	**T2**											
	MZ DZ combined			MZ			DZ					
	r	p	n	r	p	n	r	p	n	A	C	E
Love and relationships	.13	<.001	810	.23	<.001	362	.05	.300	442	.19 (.03-.28)	.00 (.00-.12)	.81 (.72-.90)
Achievement motivation	.29	<.001	833	.40	<.001	367	.20	<.001	460	.37 (.13-.46)	.02 (.00-.20)	.61 (.54-.70)

Importance of Relationships	.26	<.001	833	.36	<.001	367	.18	<.001	460	.36 (.12-.43)	.00 (.00-.19)	.64 (.57-.72)
Purpose in Life	.34	<.001	836	.46	<.001	370	.25	<.001	460	.49 (.27-.55)	.00 (.00-.17)	.51 (.45-.59)
Healthcare	.12	.001	836	.22	<.001	370	.01	.757	460	.19 (.04-.27)	.00 (.00-.11)	.81 (.73-.90)
Community satisfaction	.14	<.001	836	.21	<.001	370	.06	.170	460	.20 (.03-.28)	.00 (.00-.11)	.80 (.72-.90)
Attitudes towards money	.09	.012	836	.11	.030	370	.06	.171	460	.11 (.00-.20)	.00 (.00-.13)	.89 (.80-.98)
Alcohol (frequency x quantity)	.25	<.001	831	.33	<.001	368	.18	<.001	457	.36 (.11-.45)	.01 (.00-.20)	.63 (.55-.73)
Conduct problems	.15	<.001	831	.16	.002	368	.14	.002	457	.00 (.00-.25)	.18 (.00-.25)	.82 (.75-.89)
Emotional problems	.24	<.001	831	.35	<.001	368	.17	<.001	457	.35 (.13-.42)	.00 (.00-.16)	.65 (.58-.73)
Hyperactivity	.20	<.001	831	.37	<.001	368	.06	.172	457	.33 (.23-.41)	.00 (.00-.06)	.67 (.59-.75)
Peer problems	.29	<.001	831	.39	<.001	368	.20	<.001	457	.33 (.08-.46)	.05 (.00-.24)	.62 (.54-.71)
Prosocial behaviour	.29	<.001	831	.33	<.001	368	.24	<.001	457	.19 (.00-.40)	.14 (.00-.31)	.67 (.59-.77)
General anxiety	.27	<.001	831	.37	<.001	368	.19	<.001	457	.39 (.19-.47)	.00 (.00-.15)	.61 (.53-.69)
Depression	.24	<.001	831	.35	<.001	368	.16	.001	457	.35 (.27-.43)	.00 (.00-.14)	.65 (.57-.73)
Physical activity	.31	<.001	831	.40	<.001	368	.24	<.001	457	.35 (.11-.49)	.07 (.00-.25)	.58 (.51-.67)
Media use	.27	<.001	831	.44	<.001	368	.09	.057	457	.38 (.28-.45)	.00 (.00-.06)	.62 (.55-.70)

Volunteering	.20	<.001	831	.37	<.001	368	.08	.082	457	.34 (.23-.42)	.00 (NA-.07)	.66 (.58-.75)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 27. For twins living apart: T2 change twin intraclass correlations and model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	**T2 change**											
	MZ DZ combined			MZ			DZ					
	r	p	n	r	p	n	r	p	n	A	C	E
Love and relationships	.10	.006	739	.15	.007	332	.06	.237	401	.13 (.00-.22)	.00 (.00-.16)	.87 (.78-.96)
Achievement motivation	.12	.001	752	.16	.004	332	.09	.066	414	.14 (.00-.25)	.02 (NA-.18)	.84 (.75-.94)
Importance of Relationships	.05	.146	752	.07	.228	332	.05	.320	414	.04 (.00-.17)	.03 (.00-.13)	.93 (.83-1.00)
Purpose in Life	.11	.003	755	.13	.015	335	.10	.050	414	.07 (.00-.23)	.06 (.00-.18)	.87 (.77-.96)
Healthcare	.06	.119	755	.13	.017	336	-.02	.767	413	.09 (.00-.19)	.00 (.00-.11)	.91 (.81-1.00)
Community satisfaction	.05	.165	761	.16	.003	339	-.05	.269	416	.10 (.00-.20)	.00 (NA-.07)	.90 (.80-1.00)
Attitudes towards money	.01	.770	731	.03	.601	332	-.01	.796	394	.01 (NA-.11)	.00 (.00-.07)	.99 (.89-1.00)

Alcohol (frequency x quantity)	.08	.037	667	.20	.001	307	-.02	.746	356	.18 (.04-.27)	.00 (.00-.09)	.82 (.73-.93)
Conduct problems	.11	.002	742	.14	.013	328	.10	.047	409	.08 (.00-.24)	.05 (.00-.18)	.86 (.76-.96)
Emotional problems	.12	.001	742	.21	<.001	328	.04	.378	409	.19 (.02-.28)	.00 (.00-.12)	.81 (.72-.91)
Hyperactivity	.14	<.001	742	.19	<.001	328	.09	.075	409	.19 (.00-.28)	.00 (.00-.18)	.81 (.72-.90)
Peer problems	.12	.001	742	.17	.002	328	.08	.118	409	.16 (NA-.25)	.00 (.00-.18)	.84 (.75-.94)
Prosocial behaviour	.14	<.001	742	.11	.054	328	.17	.001	409	.00 (.00-.18)	.14 (.00-.21)	.86 (.79-.93)
General anxiety	.13	<.001	708	.19	.001	321	.10	.051	381	.20 (.00-.29)	.00 (.00-.18)	.80 (.71-.90)
Depression	.07	.073	742	.06	.248	328	.07	.159	409	.00 (.00-.17)	.07 (.00-.14)	.93 (.86-1.00)
Physical activity	.21	<.001	751	.25	<.001	334	.17	<.001	411	.18 (.00-.36)	.08 (.00-.27)	.74 (.64-.84)
Media use	.14	<.001	751	.28	<.001	335	.00	.957	410	.21 (.13-.30)	.00 (.00-.09)	.79 (.70-.87)
Volunteering	.17	<.001	742	.34	<.001	328	.06	.245	409	.30 (.21-.39)	.00 (.00-.07)	.70 (.61-.79)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 28. Male model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	T1			T2			T2 change		
	A	C	E	A	C	E	A	C	E
Love and relationships	.19 (.00-.29)	.00 (.00-.16)	.81 (.71-.91)	.06 (.00-.28)	.07 (.00-.21)	.87 (.72-.99)	.00 (.00-.27)	.13 (.00-.24)	.87 (.73-.98)
Achievement motivation	.37 (.10-.46)	.01 (.00-.20)	.62 (.54-.73)	.33 (.00-.54)	.09 (.00-.36)	.58 (.46-.73)	.08 (.00-.26)	.02 (.00-.19)	.90 (.74-1.00)
Importance of Relationships	.41 (.30-.49)	.00 (.00-.05)	.59 (.51-.69)	.36 (.04-.47)	.00 (.00-.26)	.64 (.53-.76)	.16 (.00-.30)	.00 (.00-.00)	.84 (.70-.98)
Purpose in Life	.25 (.00-.47)	.14 (.00-.32)	.62 (.52-.72)	.13 (.00-.48)	.25 (.00-.42)	.62 (.50-.74)	.10 (.00-.25)	.01 (.00-.20)	.89 (.75-1.00)
Healthcare	.37 (.12-.45)	.00 (.00-.00)	.63 (.55-.73)	.00 (.00-.25)	.29 (.19-.37)	.71 (.63-.81)	.00 (.00-.24)	.20 (.00-.29)	.80 (.70-.89)
Community satisfaction	.14 (.00-.37)	.29 (.12-.43)	.57 (.48-.67)	.27 (.00-.39)	.00 (NA-.27)	.73 (.61-.89)	.08 (.00-.23)	.00 (.00-.14)	.92 (.77-1.00)
Attitudes towards money	.15 (.00-.25)	.00 (.00-.00)	.85 (.75-.94)	.19 (.00-.31)	.00 (.00-.13)	.81 (.69-.95)	.15 (.00-.29)	.00 (NA-NA)	.85 (.71-.99)
Alcohol (frequency x quantity)	.23 (.00-.42)	.09 (.00-.30)	.68 (.58-.79)	.20 (.00-.53)	.24 (.00-.45)	.56 (.45-.68)	.23 (.00-.44)	.07 (.00-.34)	.70 (.56-.87)
Conduct problems	.31 (.14-.39)	.00 (.00-.11)	.69 (.61-.79)	.00 (.00-.32)	.24 (.00-.34)	.76 (.66-.87)	.00 (.00-.24)	.10 (.00-.22)	.90 (.76-1.00)

Emotional problems	.12 (.00-.36)	.14 (.00-.28)	.74 (.64-.84)	.36 (.00-.48)	.00 (.00-.25)	.64 (.52-.80)	.00 (.00-.27)	.10 (.00-.21)	.90 (.73-1.00)
Hyperactivity	.32 (.09-.41)	.00 (.00-.16)	.68 (.59-.79)	.34 (.14-.46)	.00 (.00-.14)	.66 (.54-.79)	.23 (.00-.43)	.05 (.00-.30)	.71 (.57-.87)
Peer problems	.35 (.08-.46)	.02 (.00-.22)	.63 (.54-.74)	.09 (.00-.44)	.23 (.00-.39)	.68 (.55-.80)	.00 (.00-.23)	.12 (.00-.23)	.88 (.76-1.00)
Prosocial behaviour	.34 (.09-.42)	.00 (.00-.18)	.66 (.58-.76)	.45 (.19-.54)	.00 (.00-.19)	.55 (.46-.67)	.22 (.00-.36)	.00 (.00-.21)	.78 (.64-.94)
General anxiety	.34 (.09-.44)	.00 (.00-.17)	.66 (.56-.78)	.42 (.18-.54)	.00 (.00-.15)	.58 (.46-.73)	.03 (.00-.22)	.00 (.00-.13)	.97 (.78-1.00)
Depression	.25 (.00-.34)	.00 (.00-.19)	.75 (.66-.87)	.43 (.19-.55)	.00 (.00-.15)	.57 (.45-.72)	.30 (.00-.46)	.00 (.00-.19)	.70 (.54-.89)
Physical activity	.34 (.15-.43)	.00 (.00-.14)	.66 (.57-.75)	.32 (.00-.47)	.02 (NA-.31)	.65 (.53-.81)	.17 (.00-.33)	.02 (.00-.25)	.81 (.67-.97)
Media use	.52 (.38-.59)	.00 (.00-.10)	.48 (.41-.57)	.36 (.18-.47)	.00 (.00-.13)	.64 (.53-.76)	.19 (.00-.32)	.00 (.00-.19)	.81 (.68-.95)
Volunteering	.38 (.19-.46)	.00 (.00-.13)	.62 (.54-.72)	.47 (.27-.57)	.00 (.00-.14)	.53 (.43-.65)	.39 (.21-.51)	.00 (.00-.11)	.61 (.49-.75)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 29. Female model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses).

Construct	**T1**			**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**	**A**	**C**	**E**
Love and relationships	.18 (.03-.24)	.00 (.00-.11)	.82 (.76-.89)	.26 (.12-.34)	.00 (.00-.09)	.74 (.66-.83)	.15 (.00-.24)	.00 (.00-.11)	.85 (.76-.94)

Achievement motivation	.34 (.24-.40)	.00 (.00-.07)	.66 (.60-.72)	.36 (.28-.43)	.00 (.00-.11)	.64 (.57-.72)	.17 (.00-.26)	.00 (.00-.16)	.83 (.74-.92)
Importance of Relationships	.35 (.28-.41)	.00 (.00-.00)	.65 (.59-.71)	.34 (.17-.41)	.00 (.00-.13)	.66 (.59-.73)	.05 (.00-.14)	.00 (.00-.10)	.95 (.86-1.00)
Purpose in Life	.39 (.25-.45)	.00 (.00-.11)	.61 (.55-.67)	.49 (.42-.55)	.00 (.00-.15)	.51 (.45-.58)	.04 (.00-.25)	.11 (.00-.21)	.85 (.75-.93)
Healthcare	.34 (.23-.40)	.00 (.00-.00)	.66 (.60-.72)	.12 (.00-.23)	.00 (.00-.14)	.88 (.77-1.00)	.00 (.00-.11)	.00 (.00-.07)	1.00 (.89-1.00)
Community satisfaction	.14 (.00-.30)	.28 (.15-.40)	.58 (.52-.64)	.30 (.15-.38)	.00 (.00-.11)	.70 (.62-.79)	.17 (.05-.26)	.00 (.00-.08)	.83 (.74-.93)
Attitudes towards money	.26 (.17-.32)	.00 (.00-.05)	.74 (.68-.81)	.15 (.00-.23)	.00 (.00-.15)	.85 (.77-.94)	.06 (.00-.16)	.00 (.00-.11)	.94 (.84-1.00)
Alcohol (frequency x quantity)	.36 (.26.42)	.00 (.00.00)	.64 (.58.71)	.39 (.23-.47)	.00 (.00-.12)	.61 (.53-.69)	.14 (.00-.24)	.00 (.00-.09)	.86 (.76-.96)
Conduct problems	.26 (.08-.32)	.00 (.00-.13)	.74 (.68-.82)	.08 (.00-.29)	.11 (.00-.24)	.81 (.71-.89)	.12 (.00-.27)	.06 (.00-.21)	.83 (.73-.93)
Emotional problems	.38 (.24-.44)	.00 (.00-.11)	.62 (.56-.68)	.40 (.17-.47)	.01 (.00-.19)	.59 (.53-.67)	.25 (.13-.34)	.00 (.00-.09)	.75 (.66-.84)
Hyperactivity	.40 (.29-.46)	.00 (.00-.08)	.60 (.54-.66)	.34 (.22-.41)	.00 (.00-.08)	.66 (.59-.75)	.16 (.00-.25)	.00 (.00-.15)	.84 (.75-.93)
Peer problems	.27 (.09-.44)	.13 (.00-.26)	.61 (.55-.67)	.46 (.23-.52)	.00 (.00-.19)	.54 (.48-.61)	.21 (.03-.29)	.00 (.00-.14)	.79 (.71-.88)

Prosocial behaviour	.22 (.08-.28)	.00 (.00-.10)	.78 (.72-.84)	.24 (.00-.38)	.06 (.00-.26)	.70 (.62-.79)	.00 (.00-.19)	.14 (.00-.21)	.86 (.79-.93)
General anxiety	.37 (.27.43)	.00 (.00.08)	.63 (.57.69)	.45 (.37-.52)	.00 (.00-.15)	.55 (.48-.63)	.31 (.11-.39)	.00 (.00-.15)	.69 (.61-.78)
Depression	.27 (.09-.42)	.09 (.00-.24)	.64 (.58-.70)	.39 (.16-.46)	.00 (.00-.18)	.61 (.54-.69)	.05 (.00-.20)	.05 (.00-.16)	.89 (.80-.98)
Physical activity	.42 (.27-.48)	.00 (.00-.12)	.58 (.52-.64)	.27 (.04-.49)	.17 (.00-.35)	.56 (.49-.64)	.17 (.00-.38)	.13 (.00-.30)	.71 (.61-.81)
Media use	.42 (.26-.48)	.00 (.00-.13)	.58 (.52-.64)	.47 (.33-.53)	.00 (.00-.11)	.53 (.47-.60)	.30 (.16-.37)	.00 (.00-.10)	.70 (.63-.79)
Volunteering	.30 (.19-.35)	.00 (.00-.00)	.70 (.65-.77)	.30 (.18-.38)	.00 (.00-.07)	.70 (.62-.79)	.24 (.14-.33)	.00 (.00-.10)	.76 (.67-.86)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 30. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in SES.

Construct	**T1**			**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**	**A**	**C**	**E**
Love and relationships	.18 (.06-.24)	.00 (.00-.09)	.82 (.76-.88)	.23 (.06-.31)	.00 (.00-.13)	.77 (.69-.84)	.16 (.00-.24)	.00 (.00-.15)	.84 (.76-.90)
Achievement motivation	.37 (.26-.42)	.00 (.00-.07)	.63 (.58-.69)	.38 (.31-.45)	.00 (.00-.14)	.62 (.55-.69)	.14 (.00-.22)	.00 (.00-.14)	.86 (.78-.95)
Importance of Relationships	.39 (.34-.44)	.00 (.00-.00)	.61 (.56-.66)	.36 (.21-.42)	.00 (.00-.12)	.64 (.58-.71)	.09 (.00-.18)	.00 (.00-.10)	.91 (.82-.99)

Purpose in Life	.36 (.21-.45)	.04 (.00-.15)	.61 (.55-.66)	.44 (.25-.54)	.04 (.00-.19)	.52 (.46-.59)	.08 (.00-.25)	.09 (.00-.20)	.84 (.75-.92)
Healthcare	.36 (.27-.42)	.00 (.00-.06)	.64 (.58-.69)	.16 (.00-.30)	.06 (.00-.22)	.78 (.70-.87)	.08 (.00-.20)	.03 (.00-.15)	.89 (.80-.97)
Community satisfaction	.13 (.00-.27)	.28 (.18-.39)	.59 (.53-.64)	.29 (.16-.36)	.00 (.00-.09)	.71 (.64-.79)	.14 (.04-.22)	.00 (.00-.06)	.86 (.78-.95)
Attitudes towards money	.22 (.15-.27)	.00 (.00-.04)	.78 (.73-.84)	.15 (.03-.23)	.00 (.00-.09)	.85 (.77-.92)	.08 (.00-.16)	.00 (.00-.09)	.92 (.84-1.00)
Alcohol (frequency x quantity)	.36 (.23-.41)	.00 (.00-.09)	.64 (.59-.70)	.43 (.23-.49)	.00 (.00-.15)	.57 (.51-.64)	.21 (.07-.29)	.00 (.00-.09)	.79 (.71-.88)
Conduct problems	.23 (.11-.29)	.00 (.00-.09)	.77 (.71-.83)	.09 (.00-.30)	.13 (.00-.25)	.78 (.69-.86)	.05 (.00-.24)	.10 (.00-.20)	.85 (.76-.93)
Emotional problems	.33 (.18-.39)	.01 (.00-.13)	.66 (.61-.72)	.38 (.25-.45)	.00 (.00-.12)	.62 (.55-.68)	.23 (.11-.31)	.00 (.00-.09)	.77 (.69-.85)
Hyperactivity	.35 (.26-.41)	.00 (.00-.07)	.65 (.59-.70)	.34 (.26-.41)	.00 (.00-.05)	.66 (.59-.74)	.20 (.02-.28)	.00 (.00-.13)	.80 (.72-.88)
Peer problems	.30 (.15-.41)	.05 (.00-.17)	.64 (.59-.70)	.40 (.19-.47)	.00 (NA-.17)	.60 (.53-.67)	.14 (.00-.24)	.02 (.00-.18)	.84 (.76-.93)
Prosocial behaviour	.26 (.15-.32)	.00 (.00-.08)	.74 (.68-.79)	.36 (.29-.42)	.00 (.00-.14)	.64 (.58-.71)	.06 (.00-.24)	.10 (.00-.20)	.85 (.76-.92)
General anxiety	.37 (.27-.42)	.00 (.00-.07)	.63 (.58-.69)	.44 (.37-.50)	.00 (.00-.08)	.56 (.50-.63)	.25 (.10-.34)	.00 (.00-.08)	.75 (.66-.83)
Depression	.27 (.11-.37)	.04 (.00-.17)	.68 (.63-.74)	.39 (.28-.46)	.00 (.00-.08)	.61 (.54-.68)	.17 (.05-.25)	.00 (.00-.15)	.83 (.75-.91)

Physical activity	.38 (.26-.43)	.00 (.00-.09)	.62 (.57-.67)	.26 (.06-.46)	.13 (.00-.29)	.60 (.53-.68)	.13 (.00-.33)	.12 (.00-.27)	.75 (.67-.84)
Media use	.47 (.40-.51)	.00 (.00-.04)	.53 (.49-.58)	.45 (.38-.50)	.00 (.00-.07)	.55 (.50-.62)	.29 (.18-.36)	.00 (.00-.08)	.71 (.64-.78)
Volunteering	.32 (.24-.37)	.00 (.00-.00)	.68 (.63-.73)	.36 (.29-.43)	.00 (.00-.05)	.64 (.57-.71)	.29 (.19-.37)	.00 (.00-.06)	.71 (.63-.79)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 31. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in job/financial difficulties.

Construct	**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**
Love and relationships	.22 (.08-.29)	.00 (.00-.08)	.78 (.71-.86)	.15 (.00-.23)	.00 (.00-.13)	.85 (.77-.93)
Achievement motivation	.40 (.23-.46)	.00 (.00-.13)	.60 (.54-.67)	.16 (.00-.23)	.00 (.00-.14)	.84 (.77-.93)
Importance of Relationships	.36 (.21-.42)	.00 (.00-.12)	.64 (.58-.71)	.09 (.00-.17)	.00 (.00-.10)	.91 (.83-.99)
Purpose in Life	.41 (.21-.52)	.05 (.00-.21)	.54 (.48-.61)	.11 (.00-.24)	.05 (.00-.18)	.84 (.76-.93)
Healthcare	.17 (.00-.32)	.06 (.00-.23)	.76 (.68-.86)	.11 (.00-.22)	.02 (.00-.16)	.87 (.78-.96)
Community satisfaction	.28 (.20-.35)	.00 (.00-.10)	.72 (.65-.80)	.14 (.04-.22)	.00 (.00-.00)	.86 (.78-.95)
Attitudes towards money	.15 (.02-.22)	.00 (.00-.10)	.85 (.78-.92)	.07 (.00-.16)	.00 (.00-.09)	.93 (.84-1.00)

Alcohol (frequency x quantity)	.43 (.23-.49)	.00 (.00-.15)	.57 (.51-.64)	.20 (.08-.29)	.00 (.00-.00)	.80 (.71-.89)
Conduct problems	.00 (.00-.21)	.19 (.02-.24)	.81 (.76-.88)	.04 (.00-.24)	.12 (.00-.21)	.84 (.76-.92)
Emotional problems	.39 (.22-.45)	.00 (.00-.13)	.61 (.55-.68)	.23 (.10-.30)	.00 (.00-.09)	.77 (.70-.85)
Hyperactivity	.33 (.24-.40)	.00 (.00-.06)	.67 (.60-.74)	.21 (.01-.29)	.00 (.00-.00)	.79 (.71-.87)
Peer problems	.37 (.17-.47)	.05 (.00-.21)	.59 (.53-.66)	.19 (.00-.26)	.00 (.00-.00)	.81 (.74-.90)
Prosocial behaviour	.34 (.13-.42)	.02 (.00-.18)	.64 (.58-.72)	.06 (.00-.26)	.11 (.00-.21)	.83 (.74-.91)
General anxiety	.43 (.29-.49)	.00 (.00-.10)	.57 (.51-.64)	.26 (.12-.34)	.00 (.00-.00)	.74 (.66-.82)
Depression	.38 (.24-.44)	.00 (.00-.11)	.62 (.56-.69)	.13 (.00-.23)	.02 (.00-.17)	.85 (.77-.94)
Physical activity	.30 (.10-.48)	.12 (.00-.27)	.58 (.52-.65)	.14 (.00-.34)	.12 (.00-.27)	.74 (.66-.83)
Media use	.43 (.37-.49)	.00 (.00-.07)	.57 (.51-.63)	.26 (.15-.33)	.00 (.00-.08)	.74 (.67-.81)
Volunteering	.34 (.26-.40)	.00 (.00-.06)	.66 (.60-.74)	.28 (.18-.35)	.00 (.00-.06)	.72 (.65-.80)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 32. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in garden access during the lockdown.

Construct	**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**
Love and relationships	.23 (.09-.30)	.00 (.00-.00)	.77 (.70-.84)	.15 (.00-.23)	.00 (NA-NA)	.85 (.77-.92)

Achievement motivation	.38 (.22-.44)	.00 (.00-.13)	.62 (.56-.68)	.15 (.00-.23)	.00 (.00-.14)	.85 (.77-.93)
Importance of Relationships	.36 (.22-.42)	.00 (.00-.11)	.64 (.58-.71)	.10 (.00-.17)	.00 (.00-.00)	.90 (.83-.98)
Purpose in Life	.41 (.22-.52)	.05 (.00-.20)	.54 (.48-.61)	.05 (.00-.23)	.09 (.00-.18)	.86 (.77-.94)
Healthcare	.14 (.00-.30)	.07 (.00-.23)	.79 (.70-.87)	.08 (.00-.20)	.03 (.00-.15)	.89 (.80-.97)
Community satisfaction	.28 (.14-.35)	.00 (.00-.10)	.72 (.65-.79)	.14 (.04-.22)	.00 (.00-.00)	.86 (.78-.94)
Attitudes towards money	.16 (.03-.23)	.00 (.00-.09)	.84 (.77-.91)	.09 (.00-.17)	.00 (.00-.09)	.91 (.83-.99)
Alcohol (frequency x quantity)	.40 (.20-.49)	.02 (.00-.18)	.58 (.51-.65)	.19 (.06-.28)	.00 (.00-.00)	.81 (.72-.89)
Conduct problems	.01 (.00-.24)	.19 (.01-.25)	.81 (.72-.87)	.04 (.00-.23)	.10 (.00-.19)	.86 (.77-.93)
Emotional problems	.39 (.21-.45)	.00 (.00-.15)	.61 (.55-.68)	.22 (.10-.30)	.00 (.00-.00)	.78 (.70-.85)
Hyperactivity	.34 (.25-.40)	.00 (.00-.05)	.66 (.60-.73)	.20 (.01-.28)	.00 (.00-.15)	.80 (.72-.88)
Peer problems	.35 (.16-.48)	.07 (.00-.23)	.58 (.52-.65)	.18 (.00-.26)	.00 (.00-.18)	.82 (.74-.90)
Prosocial behaviour	.35 (.14-.42)	.01 (.00-.17)	.65 (.58-.72)	.03 (.00-.23)	.12 (.00-.20)	.85 (.77-.92)
General anxiety	.44 (.32-.50)	.00 (.00-.09)	.56 (.50-.63)	.26 (.11-.33)	.00 (.00-.00)	.74 (.67-.82)
Depression	.39 (.24-.45)	.00 (.00-.11)	.61 (.55-.68)	.12 (.00-.22)	.02 (.00-.16)	.86 (.78-.95)
Physical activity	.30 (.10-.47)	.12 (.00-.27)	.58 (.52-.66)	.17 (.00-.34)	.10 (.00-.26)	.74 (.66-.83)
Media use	.44 (.35-.49)	.00 (.00-.06)	.56 (.51-.62)	.27 (.16-.33)	.00 (.00-.07)	.73 (.67-.81)
Volunteering	.35 (.26-.41)	.00 (.00-.05)	.65 (.59-.72)	.28 (.19-.36)	.00 (.00-.00)	.72 (.64-.80)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table33. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in living conditions (number of rooms: people in home during the lockdown).

Construct	**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**
Love and relationships	.23 (.09-.30)	.00 (.00-.10)	.77 (.70-.85)	.15 (.00-.23)	.00 (.00-.13)	.85 (.77-.92)
Achievement motivation	.38 (.21-.44)	.00 (.00-.13)	.62 (.56-.69)	.15 (.00-.23)	.00 (.00-.14)	.85 (.77-.93)
Importance of Relationships	.36 (.21-.42)	.00 (.00-.11)	.64 (.58-.71)	.09 (.00-.17)	.00 (.00-.00)	.91 (.83-.99)
Purpose in Life	.40 (.21-.52)	.06 (.00-.21)	.54 (.48-.61)	.05 (.00-.23)	.09 (.00-.19)	.86 (.77-.93)
Healthcare	.15 (.00-.29)	.06 (.00-.21)	.79 (.71-.88)	.08 (.00-.20)	.03 (.00-.15)	.89 (.80-.97)
Community satisfaction	.29 (.15-.36)	.00 (.00-.10)	.71 (.64-.78)	.14 (.04-.22)	.00 (.00-.06)	.86 (.78-.94)
Attitudes towards money	.16 (.03-.23)	.00 (.00-.09)	.84 (.77-.91)	.09 (.00-.17)	.00 (.00-.09)	.91 (.83-.99)
Alcohol (frequency x quantity)	.40 (.20-.49)	.02 (.00-.18)	.58 (.51-.65)	.20 (.07-.28)	.00 (.00-.00)	.80 (.72-.88)
Conduct problems	.00 (.00-.23)	.18 (.01-.24)	.82 (.74-.88)	.04 (.00-.23)	.10 (.00-.19)	.86 (.77-.93)
Emotional problems	.39 (.19-.45)	.00 (.00-.16)	.61 (.55-.68)	.22 (.10-.30)	.00 (.00-.09)	.78 (.70-.86)
Hyperactivity	.34 (.25-.41)	.00 (.00-.06)	.66 (.59-.73)	.20 (.00-.28)	.00 (.00-.15)	.80 (.72-.88)
Peer problems	.36 (.17-.48)	.06 (.00-.22)	.58 (.52-.65)	.18 (.00-.25)	.00 (.00-.17)	.82 (.75-.90)
Prosocial behaviour	.34 (.14-.42)	.01 (.00-.17)	.64 (.58-.72)	.02 (.00-.22)	.11 (.00-.19)	.86 (.78-.93)

General anxiety	.43 (.30-.49)	.00 (.00-.10)	.57 (.51-.63)	.25 (.10-.33)	.00 (.00-.00)	.75 (.67-.83)
Depression	.39 (.23-.45)	.00 (.00-.12)	.61 (.55-.68)	.12 (.00-.22)	.02 (.00-.16)	.86 (.78-.94)
Physical activity	.30 (.11-.48)	.11 (.00-.27)	.58 (.52-.65)	.18 (.00-.34)	.09 (.00-.25)	.74 (.66-.83)
Media use	.44 (.36-.50)	.00 (.00-.06)	.56 (.50-.62)	.27 (.16-.34)	.00 (.00-.08)	.73 (.66-.80)
Volunteering	.35 (.26-.42)	.00 (.00-.00)	.65 (.58-.72)	.29 (.19-.36)	.00 (.00-.06)	.71 (.64-.79)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 34. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance (95% confidence intervals in parentheses) for variables corrected for variation in having been tested or suspected of having COVID-19.

Construct	**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**
Love and relationships	.23 (.09-.30)	.00 (.00-.10)	.77 (.70-.85)	.15 (.00-.23)	.00 (.00-.00)	.85 (.77-.92)
Achievement motivation	.38 (.22-.44)	.00 (.00-.12)	.62 (.56-.68)	.15 (.00-.23)	.00 (.00-.00)	.85 (.77-.93)
Importance of Relationships	.35 (.22-.41)	.00 (.00-.10)	.65 (.59-.71)	.09 (.00-.17)	.00 (.00-.10)	.91 (.83-.99)
Purpose in Life	.41 (.22-.52)	.05 (.00-.20)	.54 (.48-.60)	.06 (.00-.23)	.08 (.00-.19)	.86 (.77-.93)
Healthcare	.14 (.00-.30)	.08 (.00-.23)	.78 (.70-.87)	.08 (.00-.20)	.03 (.00-.15)	.89 (.80-.97)
Community satisfaction	.30 (.15-.36)	.00 (.00-.00)	.70 (.64-.78)	.15 (.05-.23)	.00 (.00-.06)	.85 (.77-.93)

Attitudes towards money	.16 (.03-.23)	.00 (.00-.10)	.84 (.77-.91)	.09 (.00-.17)	.00 (.00-.09)	.91 (.83-.99)
Alcohol (frequency x quantity)	.40 (.20-.49)	.03 (.00-.19)	.57 (.51-.65)	.20 (.06-.28)	.00 (.00-.09)	.80 (.72-.89)
Conduct problems	.00 (.00-.22)	.20 (.02-.25)	.80 (.72-.86)	.03 (.00-.23)	.11 (.00-.20)	.86 (.77-.93)
Emotional problems	.38 (.20-.44)	.00 (.00-.14)	.62 (.56-.68)	.21 (.09-.29)	.00 (.00-.08)	.79 (.71-.86)
Hyperactivity	.33 (.24-.40)	.00 (.00-.06)	.67 (.60-.74)	.20 (.00-.27)	.00 (.00-.16)	.80 (.73-.89)
Peer problems	.36 (.17-.48)	.06 (.00-.22)	.58 (.52-.65)	.18 (.00-.26)	.00 (.00-.00)	.82 (.74-.90)
Prosocial behaviour	.34 (.14-.42)	.01 (.00-.17)	.64 (.58-.72)	.03 (.00-.23)	.12 (.00-.20)	.85 (.77-.92)
General anxiety	.43 (.31-.49)	.00 (.00-.09)	.57 (.51-.64)	.25 (.10-.33)	.00 (.00-.11)	.75 (.67-.83)
Depression	.38 (.23-.45)	.00 (.00-.12)	.62 (.55-.69)	.10 (.00-.21)	.03 (.00-.16)	.87 (.79-.95)
Physical activity	.30 (.10-.47)	.12 (.00-.27)	.58 (.52-.66)	.16 (.00-.34)	.10 (.00-.26)	.74 (.66-.83)
Media use	.44 (.35-.49)	.00 (.00-.06)	.56 (.51-.62)	.26 (.16-.33)	.00 (.00-.08)	.74 (.67-.81)
Volunteering	.35 (.26-.41)	.00 (.00-.05)	.65 (.59-.72)	.28 (.18-.36)	.00 (.00-.06)	.72 (.64-.80)

Note: Scores were corrected for mean age and sex differences (see Methods).

Supplementary Table 35. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance for variables (95% confidence intervals in parentheses) corrected for variation in number of COVID-19 symptoms.

Construct	**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**

Love and relationships	.23 (.08-.30)	.00 (.00-.10)	.77 (.70-.85)	.15 (.00-.23)	.00 (.00-.00)	.85 (.77-.93)
Achievement motivation	.38 (.22-.44)	.00 (.00-.00)	.62 (.56-.68)	.15 (.00-.23)	.00 (.00-.14)	.85 (.77-.94)
Importance of Relationships	.35 (.22-.41)	.00 (.00-.10)	.65 (.59-.71)	.09 (.00-.17)	.00 (.00-.00)	.91 (.83-.99)
Purpose in Life	.38 (.19-.51)	.07 (.00-.22)	.55 (.49-.62)	.03 (.00-.22)	.10 (.00-.18)	.87 (.78-.94)
Healthcare	.14 (.00-.30)	.08 (.00-.23)	.78 (.70-.87)	.09 (.00-.20)	.03 (.00-.15)	.88 (.80-.97)
Community satisfaction	.29 (.15-.36)	.00 (.00-.00)	.71 (.64-.78)	.14 (.05-.22)	.00 (.00-.00)	.86 (.78-.94)
Attitudes towards money	.16 (.03-.23)	.00 (.00-.00)	.84 (.77-.91)	.09 (.00-.17)	.00 (.00-.09)	.91 (.83-.99)
Alcohol (frequency x quantity)	.41 (.21-.49)	.02 (.00-.18)	.57 (.51-.65)	.20 (.06-.28)	.00 (.00-.00)	.80 (.72-.89)
Conduct problems	.00 (.00-.23)	.19 (.01-.25)	.81 (.72-.87)	.04 (.00-.23)	.10 (.00-.19)	.86 (.77-.93)
Emotional problems	.37 (.17-.43)	.00 (.00-.16)	.63 (.57-.71)	.20 (.07-.28)	.00 (.00-.09)	.80 (.72-.88)
Hyperactivity	.33 (.23-.39)	.00 (.00-.06)	.67 (.61-.74)	.20 (.00-.27)	.00 (.00-.16)	.80 (.73-.89)
Peer problems	.35 (.15-.48)	.07 (.00-.23)	.58 (.52-.65)	.18 (.00-.25)	.00 (.00-.18)	.82 (.75-.91)
Prosocial behaviour	.34 (.14-.42)	.01 (.00-.17)	.64 (.58-.72)	.03 (.00-.23)	.12 (.00-.20)	.85 (.77-.92)
General anxiety	.41 (.27-.47)	.00 (.00-.11)	.59 (.53-.66)	.25 (.08-.32)	.00 (.00-.12)	.75 (.68-.84)
Depression	.37 (.21-.43)	.00 (.00-.00)	.63 (.57-.70)	.09 (.00-.20)	.03 (.00-.16)	.88 (.80-.96)
Physical activity	.30 (.10-.47)	.12 (.00-.27)	.58 (.52-.66)	.17 (.00-.34)	.10 (.00-.26)	.74 (.66-.83)
Media use	.44 (.35-.49)	.00 (.00-.06)	.56 (.51-.62)	.26 (.16-.33)	.00 (.00-.08)	.74 (.67-.81)

Volunteering	.35 (.26-.41)	.00 (.00-.00)	.65 (.59-.72)	.28 (.19-.36)	.00 (.00-.06)	.72 (.64-.79)

Note: Scores were corrected for mean age and sex differences (see Methods).

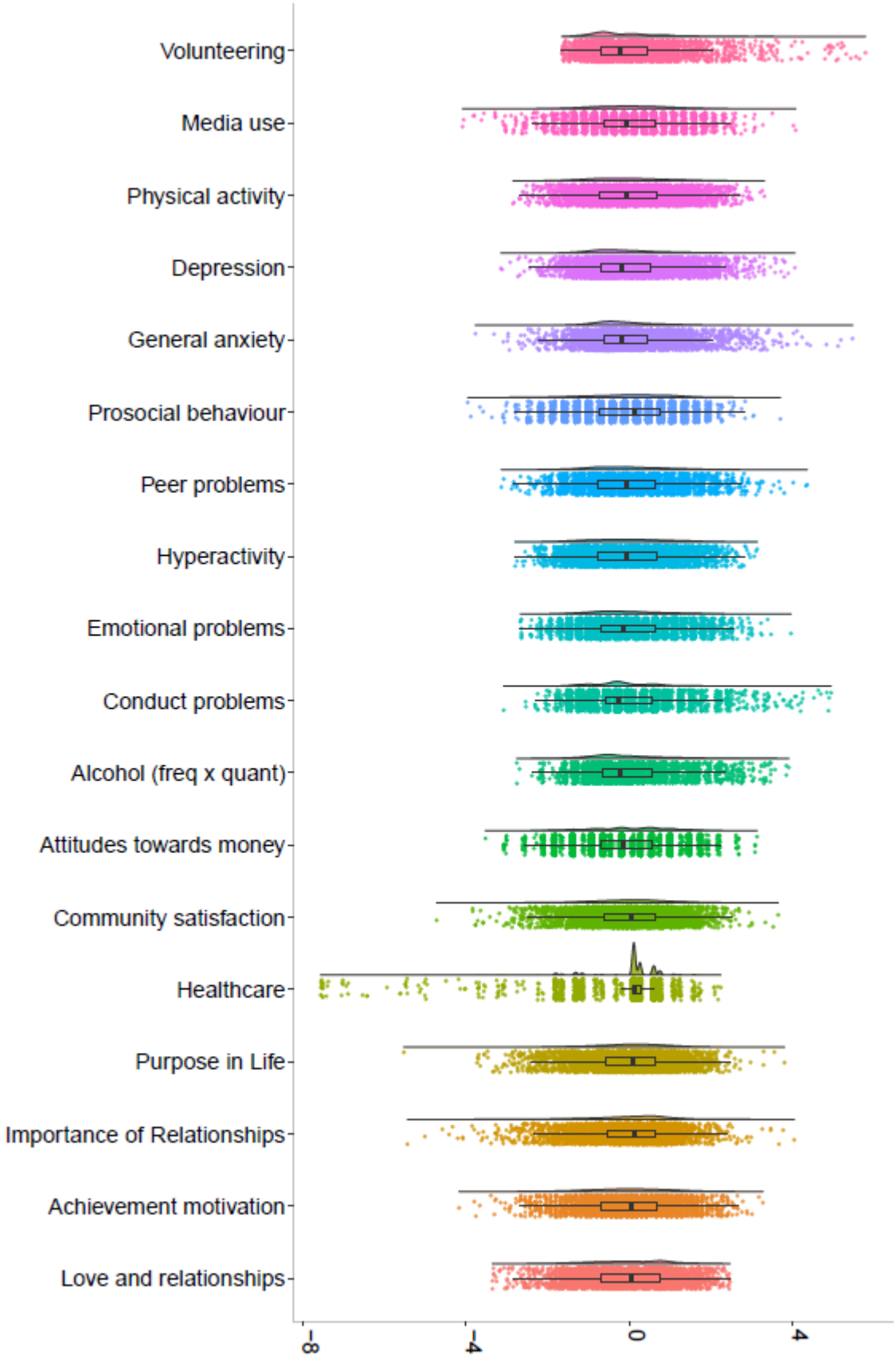
Supplementary Table 36. Model fitting results for univariate analyses of additive genetic (A), shared environmental (C), and non-shared environmental (E) components of variance for variables (95% confidence intervals in parentheses) for variables corrected for variation in number of COVID-19 symptoms (two or more) vs none.

Construct	**T2**			**T2 change**		
	A	**C**	**E**	**A**	**C**	**E**
Love and relationships	.27 (.08-.35)	.00 (NA-NA)	.73 (.65-.82)	.22 (.00-.30)	.00 (.00-.00)	.78 (.70-.87)
Achievement motivation	.32 (.08-.45)	.06 (.00-.25)	.62 (.55-.71)	.04 (.00-.21)	.07 (.00-.17)	.89 (.79-.97)
Importance of Relationships	.35 (.16-.42)	.00 (.00-.15)	.65 (.58-.72)	.07 (.00-.15)	.00 (.00-.00)	.93 (.85-1.00)
Purpose in Life	.27 (.05-.49)	.17 (.00-.34)	.56 (.49-.64)	.00 (.00-.19)	.14 (.00-.21)	.86 (.78-.93)
Healthcare	.09 (.00-.26)	.06 (.00-.20)	.84 (.74-.94)	.00 (.00-.00)	.05 (.00-.12)	.95 (.85-1.00)
Community satisfaction	.29 (.07-.37)	.00 (.00-.17)	.71 (.63-.80)	.15 (.01-.24)	.00 (.00-.10)	.85 (.76-.94)
Attitudes towards money	.19 (.03-.27)	.00 (NA-NA)	.81 (.73-.90)	.11 (.00-.20)	.00 (.00-.00)	.89 (.80-.98)
Alcohol (frequency x quantity)	.28 (.05-.47)	.12 (.00-.30)	.60 (.53-.69)	.21 (.00-.30)	.00 (.00-.16)	.79 (.70-.89)
Conduct problems	.01 (.00-.27)	.18 (.00-.25)	.82 (.71-.89)	.12 (.00-.25)	.03 (.00-.18)	.85 (.75-.96)

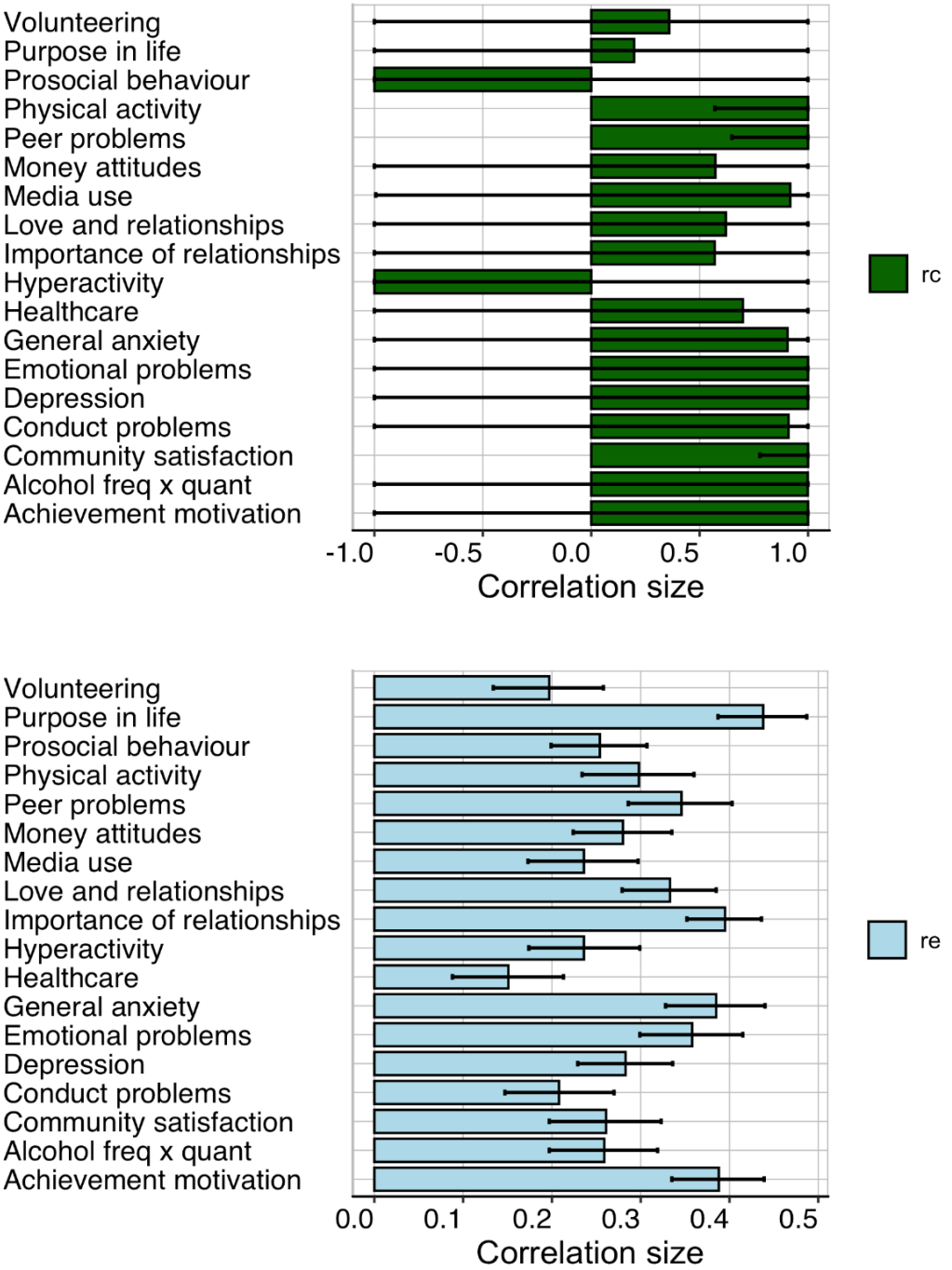
Emotional problems	.20 (.00-.39)	.11 (.00-.29)	.69 (.61-.78)	.18 (.00-.26)	.00 (.00-.00)	.82 (.74-.92)
Hyperactivity	.33 (.19-.40)	.00 (.00-.10)	.67 (.60-.75)	.13 (.00-.28)	.06 (.00-.22)	.81 (.72-.90)
Peer problems	.37 (.14-.49)	.05 (.00-.23)	.58 (.51-.66)	.15 (.00-.24)	.01 (.00-.18)	.84 (.76-.94)
Prosocial behaviour	.36 (.12-.43)	.00 (.00-.19)	.64 (.57-.73)	.13 (.00-.28)	.06 (.00-.21)	.82 (.72-.92)
General anxiety	.39 (.20-.46)	.00 (.00-.00)	.61 (.54-.69)	.27 (.05-.36)	.00 (.00-.16)	.73 (.64-.82)
Depression	.30 (.06-.42)	.04 (.00-.23)	.66 (.58-.75)	.00 (.00-.19)	.10 (.00-.17)	.90 (.81-.97)
Physical activity	.27 (.04-.48)	.15 (.00-.32)	.58 (.51-.67)	.08 (.00-.33)	.16 (.00-.29)	.76 (.66-.85)
Media use	.45 (.34-.51)	.00 (.00-.00)	.55 (.49-.62)	.29 (.13-.36)	.00 (.00-.00)	.71 (.64-.80)
Volunteering	.33 (.22-.41)	.00 (.00-.08)	.67 (.59-.74)	.28 (.15-.36)	.00 (.00-.09)	.72 (.64-.81)

Note: Scores were corrected for mean age and sex differences (see Methods).

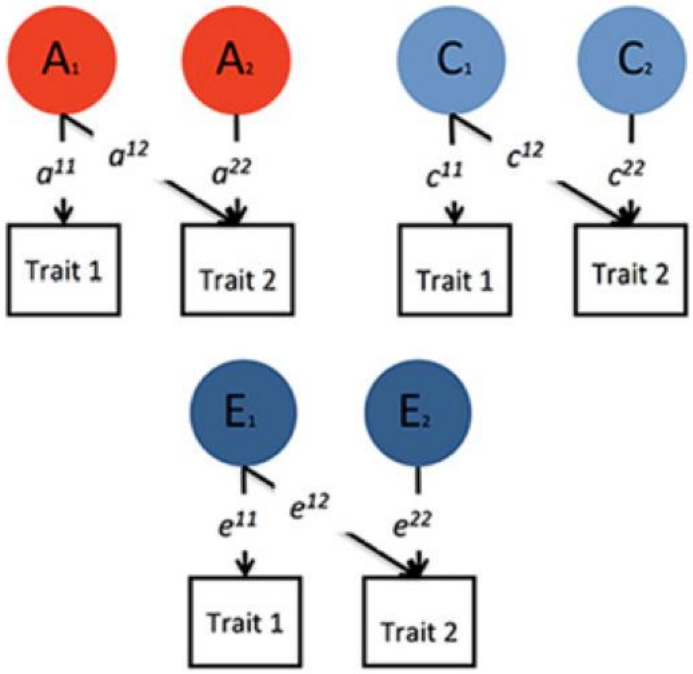
Supplementary Figures



Supplementary Figure 1. Variance in T2 change scores.



Supplementary Figure 2. Shared environmental (rC) and nonshared environmental correlations (rE).



Supplementary Figure 3. The Bivariate Cholesky decomposition.