Attrition analyses

Table S1
Attrition analyses

	Effect size	Test statistic	p	p_{adjust}
Smoking	**0.038**	4.23	<.001	<.001
Alcohol heavy	0.002	0.19	0.849	1.000
Sedatives	0.003	0.37	0.714	1.000
Soft drugs	**0.038**	4.13	<.001	<.001
XTC	**0.029**	3.07	0.002	0.013
Hallucinogens	0.005	0.51	0.610	1.000
Hard drugs	-0.014	-1.53	0.127	0.577
E	**0.078**	3.38	0.001	0.005
A	-0.039	-1.67	0.094	0.477
C	**-0.166**	-7.17	<.001	<.001
N	**0.071**	3.06	0.002	0.013
O	0.029	1.24	0.217	0.897
SE	**-0.111**	-4.79	<.001	<.001
LS	**-0.101**	-4.35	<.001	<.001

Note. Depicted are the results from the attrition analyses. We ran logistic regressions predicting substance use on the first measurement occasion by attrition status. We can linear regressions predicting personality on the first measurement occasion by attrition status. Effect sizes for substance use were Phi coefficients, while effect sizes for personality were standardized mean differences. Similarly, the test statistics were Z-values and t-values for substance use and personality, respectively. The p-values were adjusted to control the false discovery rate. Significant group differences are shown in bold. E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness, SE = self-esteem, LS = life satisfaction.

Updated Power Analysis

For the power analyses, we simulated n = 1000 datasets for each power condition. In each dataset, we used the existing substance use data but replaced personality data with randomly generated data. The personality data was simulated by including random intercepts and effects of substance use between and within subjects on personality. Note that we did not model random slopes for the within-person effects, which would lead to slight overestimations of the power.

Table S2
Updated power analysis

	Power within subjects				Power between subjects			
	$d = .10$	$d = .30$	$d = .50$	$d = .80$	$d = .10$	$d = .30$	$d = .50$	$d = .80$
Smoking	.995	1.00	1.00	1.00	.877	1.00	1.00	1.00
Alcohol heavy	.892	1.00	1.00	1.00	.081	.970	1.00	1.00
Sedatives	.842	1.00	1.00	1.00	.093	.964	1.00	1.00
Soft drugs	.449	1.00	1.00	1.00	.108	.991	1.00	1.00
Ecstasy	.072	.940	1.00	1.00	.005	.239	.749	.999
Hallucinogens	.020	.364	.937	1.00	.007	.038	.127	.487
Hard drugs	.047	.827	1.00	1.00	.007	.238	.774	.997

Note. Values represent the simulated power from $n = 1000$ iterations. The significance threshold was set at $t = 2.97$, corresponding to a two-tailed $p = .003$ for large degrees of freedom.

Full models

Table S3
DV: Extraversion, IV: Smoking

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	-0.018	0.015	-1.14	13414	.253		
Age	-0.003	0.001	-6.42	11300	<.001		
Age^2	0.010	0.002	4.55	25943	<.001		
Sex	0.017	0.018	0.90	10781	.366		
Testing	-0.010	0.002	-4.40	31640	<.001		
BP	0.162	0.025	6.51	11005	<.001	<.001	<.001
WP	0.051	0.018	2.76	932	.006		.084
Time	0.011	0.012	0.86	24379	.387		
WP x time	-0.098	0.072	-1.37	5491	.171		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S4
DV: Agreeableness, IV: Smoking

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	-0.292	0.014	-20.27	13540	<.001		
Age	0.005	0.000	9.78	11028	<.001		
Age^2	-0.010	0.002	-4.52	20317	<.001		
Sex	0.644	0.017	38.46	10640	<.001		
Testing	-0.020	0.003	-7.92	30522	<.001		
BP	-0.015	0.023	-0.64	10974	.519		1.000
WP	0.052	0.023	2.26	972	.024		.262
Time	0.014	0.014	0.93	25574	.351		
WP x time	-0.143	0.086	-1.65	6128	.098		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S5
DV: Conscientiousness, IV: Smoking

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	0.024	0.015	1.62	13528	.105		
Age	0.010	0.001	20.07	11180	<.001		
Age^2	-0.041	0.002	-18.99	22299	<.001		
Sex	0.169	0.018	9.67	10748	<.001		
Testing	-0.008	0.002	-3.22	30864	.001		
BP	-0.164	0.024	-6.88	11035	<.001	<.001	<.001
WP	0.011	0.021	0.53	948	.595		1.000
Time	0.018	0.014	1.33	25113	.185		
WP x time	-0.079	0.081	-0.97	5824	.332		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S6
DV: Neuroticism, IV: Smoking

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	-0.147	0.015	-9.88	13525	<.001		
Age	-0.006	0.001	-10.82	11199	<.001		
Age^2	0.009	0.002	4.30	22637	<.001		
Sex	0.328	0.018	18.65	10759	<.001		
Testing	-0.027	0.002	-10.83	30938	<.001		
BP	0.077	0.024	3.24	11040	.001	.001	.013
WP	-0.077	0.020	-3.84	926	<.001		.003
Time	-0.009	0.014	-0.67	25077	.502		
WP x time	0.083	0.079	1.05	5395	.295		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S7
DV: Openness, IV: Smoking

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	0.170	0.015	11.29	13490	<.001		
Age	-0.009	0.001	-17.29	11199	<.001		
Age^2	-0.022	0.002	-10.23	23103	<.001		
Sex	-0.176	0.018	-9.89	10748	<.001		
Testing	0.002	0.002	0.97	31022	.333		
BP	-0.040	0.024	-1.65	11019	.100		.901
WP	0.032	0.019	1.69	968	.092		.847
Time	-0.038	0.013	-2.83	24974	.005		
WP x time	0.095	0.077	1.24	5341	.215		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S8
DV: Self-esteem, IV: Smoking

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	0.198	0.015	13.08	13428	<.001		
Age	0.007	0.001	14.22	10969	<.001		
Age^2	-0.029	0.002	-12.92	20715	<.001		
Sex	-0.154	0.018	-8.73	10570	<.001		
Testing	-0.025	0.003	-9.33	30587	<.001		
BP	-0.063	0.024	-2.62	10892	.009		.122
WP	0.055	0.022	2.51	939	.012		.162
Time	-0.005	0.015	-0.32	25418	.748		
WP x time	0.029	0.086	0.34	5517	.735		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S9
DV: Life satisfaction, IV: Smoking

	B	se	t	df	p	$p_{\text{one-tailed}}$	p_{adjust}
Intercept	0.003	0.015	0.18	13588	.855		
Age	0.002	0.001	3.94	11000	<.001		
Age^2	-0.001	0.002	-0.23	19686	.822		
Sex	0.021	0.017	1.20	10626	.232		
Testing	-0.015	0.003	-5.35	30458	<.001		
BP	-0.278	0.024	-11.67	10980	<.001	<.001	<.001
WP	0.046	0.024	1.90	958	.057		.549
Time	-0.044	0.016	-2.83	25818	.005		
WP x time	-0.029	0.093	-0.31	5927	.754		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S10
DV: Extraversion, IV: Alcohol heavy

	B	se	t	df	p	$p_{\text{one-tailed}}$	p_{adjust}
Intercept	-0.014	0.015	-0.89	13390	.375		
Age	-0.004	0.001	-6.83	11282	<.001		
Age^2	0.009	0.002	4.04	26005	<.001		
Sex	0.019	0.019	1.03	10798	.302		
Testing	-0.010	0.002	-4.60	31670	<.001		
BP	0.158	0.065	2.42	11117	.015		.190
WP	0.026	0.021	1.25	22792	.211	.105	.936
Time	0.010	0.012	0.78	24443	.438		
WP x time	0.067	0.094	0.71	23712	.477		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S11
DV: Agreeableness, IV: Alcohol heavy

	B	se	t	df	p	$p_{\text{one-tailed}}$	p_{adjust}
Intercept	-0.286	0.015	-19.67	13511	<.001		
Age	0.005	0.000	9.89	11018	<.001		
Age^2	-0.010	0.002	-4.71	20326	<.001		
Sex	0.638	0.017	37.46	10667	<.001		
Testing	-0.022	0.003	-8.37	30529	<.001		
BP	-0.119	0.060	-1.99	11170	.047	.023	.257
WP	0.007	0.025	0.29	23310	.774	.613	1.000
Time	0.013	0.015	0.93	25699	.354		
WP x time	0.038	0.112	0.34	24869	.733		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S12
DV: Conscientiousness, IV: Alcohol heavy

	B	se	t	df	p	$p_{\text{one-tailed}}$	p_{adjust}
Intercept	0.029	0.015	1.93	13497	.054		
Age	0.010	0.001	20.55	11164	<.001		
Age^2	-0.041	0.002	-18.89	22340	<.001		
Sex	0.159	0.018	8.92	10767	<.001		
Testing	-0.009	0.002	-3.52	30875	<.001		
BP	-0.304	0.063	-4.86	11193	<.001	<.001	<.001
WP	-0.026	0.023	-1.12	23117	.262	.131	1.000
Time	0.017	0.014	1.25	25200	.212		
WP x time	-0.051	0.106	-0.48	24396	.630		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S13
DV: Neuroticism, IV: Alcohol heavy

	B	se	t	df	p	$p_{\text{one-tailed}}$	p_{adjust}
Intercept	-0.155	0.015	-10.28	13494	<.001		
Age	-0.006	0.001	-11.08	11183	<.001		
Age^2	0.010	0.002	4.41	22659	<.001		
Sex	0.336	0.018	18.82	10778	<.001		
Testing	-0.025	0.002	-10.31	30938	<.001		
BP	0.218	0.063	3.48	11194	<.001	<.001	.006
WP	0.017	0.023	0.75	23090	.451	.225	1.000
Time	-0.010	0.014	-0.71	25130	.476		
WP x time	-0.059	0.105	-0.56	24332	.574		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S14
DV: Openness, IV: Alcohol heavy

	B	se	t	df	p	$p_{\text{one-tailed}}$	p_{adjust}
Intercept	0.158	0.015	10.41	13460	<.001		
Age	-0.009	0.001	-17.35	11183	<.001		
Age^2	-0.021	0.002	-9.87	23138	<.001		
Sex	-0.158	0.018	-8.73	10768	<.001		
Testing	0.002	0.002	0.84	31034	.403		
BP	0.305	0.063	4.82	11166	<.001		<.001
WP	0.047	0.023	2.05	23023	.040		.400
Time	-0.038	0.013	-2.85	25001	.004		
WP x time	-0.100	0.104	-0.97	24211	.333		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S15
DV: Self-esteem, IV: Alcohol heavy

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	0.202	0.015	13.23	13394	<.001		
Age	0.007	0.001	14.45	10957	<.001		
Age²	-0.029	0.002	-12.91	20738	<.001		
Sex	-0.159	0.018	-8.89	10596	<.001		
Testing	-0.026	0.003	-9.71	30578	<.001		
BP	-0.152	0.063	-2.41	11075	.016		.191
WP	0.000	0.025	-0.02	23159	.985		1.000
Time	-0.006	0.015	-0.39	25478	.694		
WP x time	0.074	0.115	0.64	24647	.522		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S16
DV: Life satisfaction, IV: Alcohol heavy

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	-0.001	0.015	-0.04	13548	.972		
Age	0.002	0.001	4.62	10997	<.001		
Age²	0.001	0.002	0.37	19804	.713		
Sex	0.020	0.018	1.13	10658	.258		
Testing	-0.016	0.003	-5.81	30462	<.001		
BP	-0.208	0.063	-3.30	11186	.001	<.001	.011
WP	-0.008	0.027	-0.29	23401	.773	.386	1.000
Time	-0.043	0.016	-2.74	25880	.006		
WP x time	0.074	0.121	0.61	25050	.544		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S17
DV: Extraversion, IV: Sedatives

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	-0.009	0.015	-0.58	13355	.562		
Age	-0.003	0.001	-6.43	11287	<.001		
Age²	0.008	0.002	3.90	25920	<.001		
Sex	0.015	0.018	0.81	10782	.416		
Testing	-0.011	0.002	-4.96	31648	<.001		
BP	-0.191	0.064	-3.00	11124	.003	.001	.024
WP	-0.073	0.026	-2.77	472	.006		.084
Time	0.010	0.012	0.80	24412	.426		
WP x time	0.117	0.105	1.12	2122	.262		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S18
DV: Agreeableness, IV: Sedatives

	B	se	t	df	p	p_{one-tailed}	p_{adjust}
Intercept	-0.290	0.014	-20.15	13491	<.001		
Age	0.005	0.000	9.68	11027	<.001		
Age^2	-0.010	0.002	-4.58	20259	<.001		
Sex	0.643	0.017	38.34	10647	<.001		
Testing	-0.021	0.003	-8.32	30545	<.001		
BP	0.077	0.058	1.32	11175	.187		1.000
WP	-0.015	0.029	-0.52	514	.600		1.000
Time	0.013	0.015	0.90	25694	.367		
WP x time	-0.173	0.120	-1.45	2150	.148		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S19
DV: Conscientiousness, IV: Sedatives

	B	se	t	df	p	p_{one-tailed}	p_{adjust}
Intercept	0.016	0.015	1.10	13473	.270		
Age	0.011	0.001	20.78	11174	<.001		
Age^2	-0.041	0.002	-18.67	22270	<.001		
Sex	0.181	0.018	10.34	10751	<.001		
Testing	-0.009	0.002	-3.69	30894	<.001		
BP	-0.275	0.061	-4.52	11187	<.001		<.001
WP	-0.038	0.027	-1.39	480	.164		1.000
Time	0.019	0.014	1.35	25198	.177		
WP x time	0.098	0.113	0.87	1974	.385		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S20
DV: Neuroticism, IV: Sedatives

	B	se	t	df	p	p_{one-tailed}	p_{adjust}
Intercept	-0.139	0.015	-9.56	13463	<.001		
Age	-0.007	0.001	-13.51	11152	<.001		
Age^2	0.010	0.002	4.68	22073	<.001		
Sex	0.294	0.017	17.17	10733	<.001		
Testing	-0.023	0.002	-9.47	30820	<.001		
BP	1.430	0.059	24.08	11180	<.001	<.001	<.001
WP	0.130	0.029	4.53	511	<.001		<.001
Time	-0.011	0.014	-0.82	25213	.414		
WP x time	-0.236	0.115	-2.05	2248	.040		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S21
DV: Openness, IV: Sedatives

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	0.170	0.015	11.31	13433	<.001		
Age	-0.009	0.001	-17.21	11192	<.001		
Age^2	-0.022	0.002	-10.21	23084	<.001		
Sex	-0.175	0.018	-9.84	10751	<.001		
Testing	0.002	0.002	0.73	31046	.465		
BP	0.039	0.062	0.63	11154	.529		1.000
WP	-0.030	0.027	-1.09	503	.275		1.000
Time	-0.038	0.013	-2.85	24989	.004		
WP x time	-0.074	0.112	-0.66	2116	.507		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S22
DV: Self-esteem, IV: Sedatives

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	0.191	0.015	12.81	13378	<.001		
Age	0.008	0.001	16.15	10948	<.001		
Age^2	-0.029	0.002	-13.19	20412	<.001		
Sex	-0.129	0.017	-7.42	10564	<.001		
Testing	-0.028	0.003	-10.44	30558	<.001		
BP	-1.050	0.060	-17.39	11079	<.001		<.001
WP	-0.099	0.029	-3.39	518	.001		.015
Time	-0.005	0.015	-0.33	25549	.741		
WP x time	0.135	0.122	1.11	2134	.269		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S23
DV: Life satisfaction, IV: Sedatives

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	-0.015	0.015	-1.03	13497	.301		
Age	0.003	0.001	6.52	10949	<.001		
Age^2	0.001	0.002	0.39	19431	.694		
Sex	0.057	0.017	3.30	10584	.001		
Testing	-0.018	0.003	-6.59	30327	<.001		
BP	-1.191	0.060	-19.76	11205	<.001	<.001	<.001
WP	-0.091	0.038	-2.40	527	.017		.191
Time	-0.040	0.016	-2.57	25878	.010		
WP x time	0.413	0.141	2.93	2785	.003		.372

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S24
DV: Extraversion, IV: Soft drugs

	B	se	t	df	p	p_one-tailed	p_adjust
Intercept	-0.010	0.015	-0.63	13327	.527		
Age	-0.003	0.001	-6.21	11264	<.001		
Age^2	0.008	0.002	3.81	25934	<.001		
Sex	0.015	0.018	0.81	10777	.415		
Testing	-0.011	0.002	-4.79	31791	<.001		
BP	0.152	0.058	2.62	11685	.009		.122
WP	0.000	0.039	-0.00	273	.998	.499	1.000
Time	0.009	0.012	0.71	24452	.478		
WP x time	0.032	0.132	0.25	1273	.806		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S25
DV: Agreeableness, IV: Soft drugs

	B	se	t	df	p	p_one-tailed	p_adjust
Intercept	-0.290	0.014	-20.21	13465	<.001		
Age	0.005	0.000	9.80	11006	<.001		
Age^2	-0.010	0.002	-4.66	20285	<.001		
Sex	0.645	0.017	38.46	10635	<.001		
Testing	-0.021	0.003	-8.35	30637	<.001		
BP	0.030	0.054	0.56	12210	.577	.711	1.000
WP	0.003	0.045	0.07	297	.942		1.000
Time	0.013	0.015	0.92	25705	.355		
WP x time	-0.266	0.154	-1.72	1325	.085		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S26
DV: Conscientiousness, IV: Soft drugs

	B	se	t	df	p	p_one-tailed	p_adjust
Intercept	0.022	0.015	1.47	13453	.142		
Age	0.010	0.001	18.57	11151	<.001		
Age^2	-0.039	0.002	-18.02	22214	<.001		
Sex	0.160	0.018	9.15	10742	<.001		
Testing	-0.008	0.002	-3.07	30982	.002		
BP	-0.533	0.055	-9.61	12041	<.001	<.001	<.001
WP	-0.087	0.040	-2.16	247	.032		.327
Time	0.017	0.014	1.22	25226	.222		
WP x time	0.073	0.143	0.51	1052	.609		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S27
DV: Neuroticism, IV: Soft drugs

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	-0.150	0.015	-10.07	13453	<.001		
Age	-0.005	0.001	-9.69	11175	<.001		
Age^2	0.008	0.002	3.84	22567	<.001		
Sex	0.335	0.018	19.07	10758	<.001		
Testing	-0.026	0.002	-10.69	31047	<.001		
BP	0.383	0.056	6.89	12006	<.001		<.001
WP	0.061	0.038	1.59	271	.112		.963
Time	-0.009	0.014	-0.65	25146	.514		
WP x time	0.011	0.139	0.08	1116	.936		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S28
DV: Openness, IV: Soft drugs

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	0.166	0.015	11.09	13414	<.001		
Age	-0.008	0.001	-16.01	11175	<.001		
Age^2	-0.023	0.002	-10.45	23076	<.001		
Sex	-0.165	0.018	-9.28	10749	<.001		
Testing	0.001	0.002	0.49	31157	.624		
BP	0.321	0.056	5.71	11928	<.001	<.001	<.001
WP	-0.011	0.040	-0.28	286	.783	.609	1.000
Time	-0.039	0.013	-2.91	25020	.004		
WP x time	0.071	0.140	0.51	1227	.613		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S29
DV: Self-esteem, IV: Soft drugs

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	0.199	0.015	13.20	13349	<.001		
Age	0.007	0.001	13.23	10945	<.001		
Age^2	-0.028	0.002	-12.47	20676	<.001		
Sex	-0.160	0.018	-9.09	10567	<.001		
Testing	-0.025	0.003	-9.43	30688	<.001		
BP	-0.321	0.056	-5.71	12051	<.001		<.001
WP	-0.063	0.046	-1.37	280	.171		1.000
Time	-0.006	0.015	-0.43	25492	.665		
WP x time	0.227	0.157	1.44	1240	.149		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S30
DV: Life satisfaction, IV: Soft drugs

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	-0.004	0.015	-0.30	13505	.766		
Age	0.002	0.001	2.93	10985	.003		
Age^2	0.002	0.002	1.10	19730	.273		
Sex	0.017	0.018	0.97	10627	.333		
Testing	-0.015	0.003	-5.39	30534	<.001		
BP	-0.513	0.056	-9.11	12303	<.001		<.001
WP	-0.039	0.055	-0.72	296	.473	.237	1.000
Time	-0.044	0.016	-2.80	25888	.005		
WP x time	0.361	0.175	2.07	1544	.039		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S31
DV: Extraversion, IV: Ecstasy

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	-0.009	0.015	-0.59	13351	.558		
Age	-0.003	0.001	-6.46	11285	<.001		
Age^2	0.008	0.002	3.87	25903	<.001		
Sex	0.013	0.018	0.71	10781	.481		
Testing	-0.011	0.002	-4.77	31709	<.001		
BP	0.401	0.138	2.91	11730	.004	.002	.030
WP	-0.067	0.080	-0.85	90	.400		1.000
Time	0.009	0.012	0.75	24439	.455		
WP x time	-0.136	0.259	-0.52	440	.600		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S32
DV: Agreeableness, IV: Ecstasy

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	-0.290	0.014	-20.19	13480	<.001		
Age	0.005	0.000	9.70	11020	<.001		
Age^2	-0.010	0.002	-4.57	20265	<.001		
Sex	0.644	0.017	38.49	10641	<.001		
Testing	-0.021	0.003	-8.33	30565	<.001		
BP	-0.141	0.128	-1.10	12213	.273		1.000
WP	-0.011	0.088	-0.12	92	.904		1.000
Time	0.014	0.015	0.94	25682	.345		
WP x time	-0.136	0.293	-0.46	372	.644		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S33
DV: Conscientiousness, IV: Ecstasy

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	0.019	0.015	1.25	13465	.211		
Age	0.010	0.001	19.93	11169	<.001		
Age^2	-0.040	0.002	-18.50	22277	<.001		
Sex	0.173	0.018	9.87	10748	<.001		
Testing	-0.008	0.002	-3.35	30918	.001		
BP	-0.556	0.133	-4.17	12045	<.001	<.001	<.001
WP	0.014	0.086	0.16	78	.872		1.000
Time	0.018	0.014	1.32	25189	.188		
WP x time	-0.097	0.284	-0.34	348	.733		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S34
DV: Neuroticism, IV: Ecstasy

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	-0.147	0.015	-9.88	13464	<.001		
Age	-0.006	0.001	-10.72	11191	<.001		
Age^2	0.009	0.002	4.11	22601	<.001		
Sex	0.326	0.018	18.56	10763	<.001		
Testing	-0.025	0.002	-10.40	30980	<.001		
BP	0.329	0.134	2.46	12025	.014		.175
WP	0.059	0.086	0.69	92	.493		1.000
Time	-0.009	0.014	-0.68	25127	.499		
WP x time	0.155	0.282	0.55	410	.584		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S35
DV: Openness, IV: Ecstasy

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	0.169	0.015	11.24	13428	<.001		
Age	-0.009	0.001	-16.86	11191	<.001		
Age^2	-0.022	0.002	-10.25	23080	<.001		
Sex	-0.172	0.018	-9.71	10751	<.001		
Testing	0.002	0.002	0.67	31081	.500		
BP	0.390	0.135	2.90	12069	.004		.060
WP	0.054	0.083	0.66	101	.514		1.000
Time	-0.039	0.013	-2.87	24992	.004		
WP x time	-0.403	0.275	-1.46	424	.144		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S36
DV: Self-esteem, IV: Ecstasy

	B	se	t	df	p	p_one-tailed	p_adjust
Intercept	0.197	0.015	13.05	13371	<.001		
Age	0.007	0.001	14.00	10967	<.001		
Age^2	-0.029	0.002	-12.71	20677	<.001		
Sex	-0.153	0.018	-8.72	10578	<.001		
Testing	-0.025	0.003	-9.57	30617	<.001		
BP	-0.460	0.135	-3.41	12103	.001		.013
WP	-0.098	0.085	-1.15	88	.255		1.000
Time	-0.006	0.015	-0.40	25466	.686		
WP x time	-0.174	0.293	-0.59	325	.552		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S37
DV: Life satisfaction, IV: Ecstasy

	B	se	t	df	p	p_one-tailed	p_adjust
Intercept	-0.008	0.015	-0.53	13525	.599		
Age	0.002	0.001	4.30	11006	<.001		
Age^2	0.001	0.002	0.65	19755	.515		
Sex	0.030	0.018	1.70	10635	.089		
Testing	-0.016	0.003	-5.70	30496	<.001		
BP	-0.325	0.135	-2.40	12210	.016		.191
WP	0.031	0.085	0.36	84	.717		1.000
Time	-0.043	0.016	-2.73	25854	.006		
WP x time	-0.199	0.299	-0.67	280	.506		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S38
DV: Extraversion, IV: Hallucinogens

	B	se	t	df	p	p_one-tailed	p_adjust
Intercept	-0.008	0.015	-0.52	13357	.602		
Age	-0.004	0.001	-6.82	11284	<.001		
Age^2	0.008	0.002	3.94	25973	<.001		
Sex	0.010	0.018	0.55	10778	.579		
Testing	-0.010	0.002	-4.62	31686	<.001		
BP	-0.285	0.276	-1.03	12270	.301		1.000
WP	0.011	0.097	0.12	24100	.906		1.000
Time	0.009	0.012	0.74	24444	.460		
WP x time	-0.115	0.523	-0.22	25559	.826		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S39
DV: Agreeableness, IV: Hallucinogens

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	-0.290	0.014	-20.17	13487	<.001		
Age	0.005	0.000	9.68	11019	<.001		
Age^2	-0.010	0.002	-4.55	20289	<.001		
Sex	0.643	0.017	38.45	10638	<.001		
Testing	-0.021	0.003	-8.29	30539	<.001		
BP	-0.594	0.260	-2.28	5999	.023		.255
WP	-0.268	0.161	-1.66	27	.108		.944
Time	0.013	0.015	0.92	25695	.356		
WP x time	0.219	0.704	0.31	237	.756		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S40
DV: Conscientiousness, IV: Hallucinogens

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	0.019	0.015	1.24	13469	.213		
Age	0.010	0.001	20.26	11170	<.001		
Age^2	-0.040	0.002	-18.55	22324	<.001		
Sex	0.174	0.018	9.93	10745	<.001		
Testing	-0.009	0.002	-3.43	30896	.001		
BP	-0.529	0.269	-1.97	7046	.049		.476
WP	-0.420	0.138	-3.05	30	.005		.073
Time	0.018	0.014	1.27	25192	.205		
WP x time	0.161	0.639	0.25	158	.801		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S41
DV: Neuroticism, IV: Hallucinogens

	B	se	t	df	p	$p_{one-tailed}$	p_{adjust}
Intercept	-0.147	0.015	-9.86	13473	<.001		
Age	-0.006	0.001	-10.83	11191	<.001		
Age^2	0.009	0.002	4.11	22646	<.001		
Sex	0.326	0.018	18.55	10760	<.001		
Testing	-0.025	0.002	-10.39	30957	<.001		
BP	0.660	0.268	2.47	12834	.014		.175
WP	0.030	0.108	0.28	24729	.779		1.000
Time	-0.010	0.014	-0.70	25134	.484		
WP x time	0.240	0.578	0.42	26552	.678		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S42
DV: Openness, IV: Hallucinogens

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	0.169	0.015	11.28	13434	<.001		
Age	-0.009	0.001	-17.20	11188	<.001		
Age^2	-0.022	0.002	-10.19	23129	<.001		
Sex	-0.174	0.018	-9.82	10746	<.001		
Testing	0.002	0.002	0.76	31054	.445		
BP	-0.057	0.270	-0.21	12714	.834		1.000
WP	-0.014	0.106	-0.13	24607	.897	.551	1.000
Time	-0.038	0.013	-2.85	25000	.004		
WP x time	0.051	0.572	0.09	26374	.929		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S43
DV: Self-esteem, IV: Hallucinogens

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	0.196	0.015	13.02	13377	<.001		
Age	0.007	0.001	14.18	10963	<.001		
Age^2	-0.028	0.002	-12.67	20719	<.001		
Sex	-0.153	0.018	-8.69	10572	<.001		
Testing	-0.026	0.003	-9.65	30592	<.001		
BP	-0.869	0.270	-3.21	13073	.001		.024
WP	-0.095	0.118	-0.80	25014	.422		1.000
Time	-0.006	0.015	-0.42	25481	.673		
WP x time	-0.288	0.629	-0.46	27087	.648		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S44
DV: Life satisfaction, IV: Hallucinogens

	B	*se*	*t*	*df*	*p*	*p*one-tailed	*p*adjust
Intercept	-0.008	0.015	-0.55	13530	.580		
Age	0.002	0.001	4.44	11004	<.001		
Age^2	0.002	0.002	0.67	19779	.501		
Sex	0.031	0.018	1.74	10628	.081		
Testing	-0.016	0.003	-5.78	30478	<.001		
BP	-0.490	0.272	-1.80	6155	.072		.677
WP	0.087	0.136	0.64	20	.529		1.000
Time	-0.044	0.016	-2.77	25879	.006		
WP x time	-1.074	0.678	-1.58	73	.118		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S45
DV: Extraversion, IV: Hard drugs

	B	se	t	df	p	p_{one-tailed}	p_{adjust}
Intercept	-0.009	0.015	-0.59	13351	.552		
Age	-0.004	0.001	-6.56	11286	<.001		
Age^2	0.008	0.002	3.94	25931	<.001		
Sex	0.013	0.018	0.69	10780	.491		
Testing	-0.011	0.002	-4.77	31690	<.001		
BP	0.300	0.138	2.18	11344	.029		.308
WP	-0.113	0.102	-1.11	70	.273		1.000
Time	0.010	0.012	0.83	24431	.405		
WP x time	0.222	0.311	0.71	346	.477		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S46
DV: Agreeableness, IV: Hard drugs

	B	se	t	df	p	p_{one-tailed}	p_{adjust}
Intercept	-0.289	0.014	-20.11	13484	<.001		
Age	0.005	0.000	9.57	11023	<.001		
Age^2	-0.010	0.002	-4.64	20272	<.001		
Sex	0.641	0.017	38.37	10643	<.001		
Testing	-0.021	0.003	-8.27	30547	<.001		
BP	-0.398	0.127	-3.12	11434	.002		.030
WP	-0.375	0.113	-3.32	68	.001		.025
Time	0.014	0.015	0.95	25692	.341		
WP x time	1.199	0.358	3.35	297	.001		.199

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S47
DV: Conscientiousness, IV: Hard drugs

	B	se	t	df	p	p_{one-tailed}	p_{adjust}
Intercept	0.019	0.015	1.31	13474	.191		
Age	0.010	0.001	19.89	11175	<.001		
Age^2	-0.040	0.002	-18.54	22281	<.001		
Sex	0.171	0.018	9.77	10751	<.001		
Testing	-0.008	0.002	-3.30	30903	.001		
BP	-0.796	0.132	-6.04	12002	<.001	<.001	<.001
WP	-0.040	0.074	-0.54	24212	.588		1.000
Time	0.017	0.014	1.25	25212	.211		
WP x time	0.428	0.278	1.54	24516	.123		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S48
DV: Neuroticism, IV: Hard drugs

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	-0.148	0.015	-9.96	13465	<.001		
Age	-0.005	0.001	-10.58	11192	<.001		
Age^2	0.009	0.002	4.17	22594	<.001		
Sex	0.328	0.018	18.69	10763	<.001		
Testing	-0.026	0.002	-10.49	30964	<.001		
BP	0.623	0.132	4.71	11214	<.001	<.001	<.001
WP	0.143	0.098	1.45	65	.151		1.000
Time	-0.009	0.014	-0.67	25129	.501		
WP x time	-0.169	0.319	-0.53	241	.596		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S49
DV: Openness, IV: Hard drugs

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	0.169	0.015	11.26	13433	<.001		
Age	-0.009	0.001	-17.00	11193	<.001		
Age^2	-0.022	0.002	-10.24	23079	<.001		
Sex	-0.173	0.018	-9.75	10752	<.001		
Testing	0.002	0.002	0.72	31071	.475		
BP	0.275	0.134	2.05	11453	.040		.400
WP	-0.121	0.091	-1.33	81	.186		1.000
Time	-0.038	0.013	-2.83	25001	.005		
WP x time	0.511	0.310	1.65	293	.101		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S50
DV: Self-esteem, IV: Hard drugs

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	0.198	0.015	13.13	13372	<.001		
Age	0.007	0.001	13.86	10966	<.001		
Age^2	-0.028	0.002	-12.67	20663	<.001		
Sex	-0.156	0.018	-8.86	10578	<.001		
Testing	-0.025	0.003	-9.58	30596	<.001		
BP	-0.831	0.134	-6.22	11387	<.001		<.001
WP	-0.160	0.115	-1.39	64	.168		1.000
Time	-0.005	0.015	-0.36	25486	.721		
WP x time	-0.245	0.365	-0.67	278	.502		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Table S51
DV: Life satisfaction, IV: Hard drugs

	B	se	t	df	p	$p_{one\text{-}tailed}$	p_{adjust}
Intercept	-0.007	0.015	-0.46	13535	.646		
Age	0.002	0.001	4.06	11010	<.001		
Age^2	0.002	0.002	0.67	19755	.501		
Sex	0.027	0.018	1.55	10639	.121		
Testing	-0.016	0.003	-5.64	30488	<.001		
BP	-0.780	0.133	-5.85	12266	<.001	<.001	<.001
WP	-0.022	0.085	-0.26	24737	.793		1.000
Time	-0.044	0.016	-2.77	25894	.006		
WP x time	0.259	0.317	0.82	25203	.413		1.000

Note. BP = between-person effect of the respective substance, WP = within-person effect.

Random slopes

Table S52
Random slopes of the within-person effects

	E	A	C	N	O	LS	SE
Smoking	$\sigma = 0.283$ $p < .001$	$\sigma = 0.397$ $p < .001$	$\sigma = 0.355$ $p < .001$	$\sigma = 0.283$ $p < .001$	$\sigma = 0.225$ $p = .004$	$\sigma = 0.395$ $p < .001$	$\sigma = 0.315$ $p < .001$
Alcohol heavy	$\sigma = 0.002$ $p = 1.000$	$\sigma = 0.060$ $p = 1.000$	$\sigma = 0.011$ $p = 1.000$	$\sigma = 0.012$ $p = 1.000$	$\sigma = 0.000$ $p = 1.000$	$\sigma = 0.008$ $p = 1.000$	$\sigma = 0.035$ $p = 1.000$
Sedatives	$\sigma = 0.316$ $p < .001$	$\sigma = 0.263$ $p = .051$	$\sigma = 0.243$ $p = .088$	$\sigma = 0.338$ $p < .001$	$\sigma = 0.275$ $p = .003$	$\sigma = 0.561$ $p < .001$	$\sigma = 0.251$ $p = .090$
Soft drugs	$\sigma = 0.377$ $p < .001$	$\sigma = 0.412$ $p < .001$	$\sigma = 0.320$ $p = .038$	$\sigma = 0.263$ $p = .276$	$\sigma = 0.339$ $p = .002$	$\sigma = 0.618$ $p < .001$	$\sigma = 0.419$ $p < .001$
XTC	$\sigma = 0.515$ $p < .001$	$\sigma = 0.534$ $p = .002$	$\sigma = 0.522$ $p = .011$	$\sigma = 0.543$ $p < .001$	$\sigma = 0.499$ $p < .001$	$\sigma = 0.420$ $p = .233$	$\sigma = 0.466$ $p = .074$
Halluci-nogens	$\sigma = 0.309$ $p = 1.000$	$\sigma = 0.630$ $p = .157$	$\sigma = 0.548$ $p = .145$	$\sigma = 0.357$ $p = 1.000$	$\sigma = 0.237$ $p = .902$	$\sigma = 0.438$ $p = .304$	$\sigma = 0.314$ $p = 1.000$
Hard drugs	$\sigma = 0.621$ $p < .001$	$\sigma = 0.658$ $p < .001$	$\sigma = 0.304$ $p = 1.000$	$\sigma = 0.521$ $p = .016$	$\sigma = 0.437$ $p = .009$	$\sigma = 0.441$ $p = .424$	$\sigma = 0.662$ $p < .001$

Note. Depicted are the random slopes of the within-person effects of substance use on personality. The standard deviation of the random slope is indicated by σ and p indicates the p-value for the fit improvement when random slopes are modelled (adjusted to control the false discovery rate). E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness, SE = self-esteem, LS = life satisfaction.

Sensitivity Analyses

Table S53
Results of the interactions between user-status and the within-person effects of substance use

	E	A	C	N	O	LS	SE
Smoking	$B = 0.029$ [-0.096, 0.154] $t(1224) = 0.68$ $p = 1.000$	$B = -0.001$ [-0.156, 0.154] $t(1254) = -0.03$ $p = 1.000$	$B = 0.032$ [-0.113, 0.177] $t(1231) = 0.65$ $p = 1.000$	$B = -0.092$ [-0.229, 0.044] $t(1245) = -2.01$ $p = 1.000$	$B = 0.029$ [-0.102, 0.159] $t(1342) = 0.66$ $p = 1.000$	$B = -0.016$ [-0.180, 0.147] $t(1255) = -0.29$ $p = 1.000$	$B = 0.039$ [-0.111, 0.188] $t(1262) = 0.77$ $p = 1.000$
Alcohol heavy	$B = 0.017$ [-0.105, 0.138] $t(22725) = 0.41$ $p = 1.000$	$B = -0.032$ [-0.177, 0.113] $t(23204) = -0.66$ $p = 1.000$	$B = 0.097$ [-0.040, 0.235] $t(23027) = 2.11$ $p = 1.000$	$B = -0.094$ [-0.229, 0.042] $t(23001) = -2.05$ $p = 1.000$	$B = -0.021$ [-0.155, 0.113] $t(22939) = -0.47$ $p = 1.000$	$B = 0.084$ [-0.073, 0.242] $t(23290) = 1.59$ $p = 1.000$	$B = 0.044$ [-0.105, 0.192] $t(23057) = 0.87$ $p = 1.000$
Sedatives	$B = 0.005$ [-0.150, 0.161] $t(426) = 0.10$ $p = 1.000$	$B = -0.069$ [-0.238, 0.101] $t(462) = -1.20$ $p = 1.000$	$B = 0.076$ [-0.084, 0.235] $t(431) = 1.41$ $p = 1.000$	$B = -0.051$ [-0.221, 0.121] $t(458) = -0.88$ $p = 1.000$	$B = -0.025$ [-0.186, 0.135] $t(452) = -0.47$ $p = 1.000$	$B = -0.052$ [-0.278, 0.174] $t(474) = -0.68$ $p = 1.000$	$B = 0.092$ [-0.079, 0.264] $t(465) = 1.60$ $p = 1.000$
Soft drugs	$B = 0.059$ [-0.170, 0.289] $t(261) = 0.77$ $p = 1.000$	$B = -0.011$ [-0.275, 0.254] $t(285) = -0.12$ $p = 1.000$	$B = 0.026$ [-0.215, 0.265] $t(239) = 0.32$ $p = 1.000$	$B = -0.008$ [-0.233, 0.218] $t(264) = -0.11$ $p = 1.000$	$B = 0.086$ [-0.150, 0.321] $t(275) = 1.08$ $p = 1.000$	$B = -0.069$ [-0.396, 0.255] $t(280) = -0.64$ $p = 1.000$	$B = -0.039$ [-0.311, 0.232] $t(268) = -0.43$ $p = 1.000$
Ecstasy	$B = 0.012$ [-0.473, 0.492] $t(81) = 0.08$ $p = 1.000$	$B = 0.423$ [-0.090, 0.934] $t(79) = 2.48$ $p = 1.000$	$B = 0.219$ [-0.296, 0.732] $t(69) = 1.29$ $p = 1.000$	$B = 0.005$ [-0.517, 0.526] $t(82) = 0.03$ $p = 1.000$	$B = 0.187$ [-0.313, 0.678] $t(88) = 1.14$ $p = 1.000$	$B = 0.129$ [-0.391, 0.638] $t(74) = 0.76$ $p = 1.000$	$B = 0.246$ [-0.269, 0.749] $t(74) = 1.47$ $p = 1.000$
Hallucinogens	$B = 0.389$ [-0.299, 1.077] $t(22735) = 1.68$ $p = 1.000$	$B = 0.213$ [-1.046, 1.507] $t(21) = 0.52$ $p = 1.000$	$B = 0.093$ [-1.045, 1.195] $t(25) = 0.26$ $p = 1.000$	$B = 0.384$ [-0.385, 1.153] $t(22978) = 1.48$ $p = 1.000$	$B = 0.036$ [-0.723, 0.796] $t(22919) = 0.14$ $p = 1.000$	$B = -0.501$ [-1.394, 0.391] $t(23186) = -1.67$ $p = 1.000$	$B = 0.007$ [-0.837, 0.851] $t(22989) = 0.03$ $p = 1.000$

Hard drugs	$B = -0.356$ [-0.957, 0.244] $t(68) = -1.78$ $p = 1.000$	$B = -0.193$ [-0.875, 0.480] $t(65) = -0.86$ $p = 1.000$	$B = 0.040$ [-0.397, 0.478] $t(24231) = 0.27$ $p = 1.000$	$B = -0.060$ [-0.646, 0.538] $t(61) = -0.31$ $p = 1.000$	$B = 0.006$ [-0.545, 0.556] $t(80) = 0.03$ $p = 1.000$	$B = -0.036$ [-0.535, 0.463] $t(24745) = -0.22$ $p = 1.000$	$B = -0.178$ [-0.885, 0.506] $t(61) = -0.78$ $p = 1.000$

Note. Depicted are the interactions between the within-person effects and user status ("1" if participants reported using a given substance at two consecutive drug assessments and "0" otherwise). The reported *p*-values were corrected to control the false discovery rate. 99.7% confidence intervals (corresponding to the adjusted significance threshold) are shown in parentheses. E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness, LS = life satisfaction, SE = self-esteem.

Table S54

Results of the multilevel models with the overall use index and the two alcohol indices predicting personality: Between-person effects.

	E	A	C	N	O	LS	SE
Overall use	$B = 0.066$ [-0.294, 0.426] $t(11433) = 0.54$ $p = .586$	$B = -0.198$ [-0.532, 0.136] $t(11680) = -1.76$ $p = .078$	$B = -0.929$ [-1.275, -0.583] $t(11672) = -7.97$ $p < .001$	$B = 0.729$ [0.383, 1.076] $t(11672) = 6.24$ $p < .001$	$B = 0.298$ [-0.052, 0.647] $t(11883) = 2.53$ $p = .011$	$B = -0.826$ [-1.177, -0.475] $t(11485) = -6.98$ $p < .001$	$B = -0.835$ [-1.184, -0.486] $t(11665) = -7.09$ $p < .001$
Alcohol frequency	$B = 0.115$ [0.034, 0.195] $t(10755) = 4.22$ $p < .001$	$B = -0.006$ [-0.079, 0.068] $t(10566) = -0.23$ $p = .817$	$B = -0.072$ [-0.149, 0.005] $t(10692) = -2.77$ $p = .006$	$B = 0.004$ [-0.073, 0.081] $t(10710) = 0.16$ $p = .871$	$B = 0.208$ [0.130, 0.286] $t(10702) = 7.94$ $p < .001$	$B = 0.065$ [-0.012, 0.143] $t(10552) = 2.51$ $p = .012$	$B = 0.043$ [-0.034, 0.121] $t(10506) = 1.66$ $p = .097$
Heavy drinking episode	$B = 0.384$ [0.276, 0.492] $t(11322) = 10.56$ $p < .001$	$B = 0.048$ [-0.051, 0.148] $t(11533) = 1.44$ $p = .150$	$B = -0.197$ [-0.301, -0.093] $t(11484) = -5.63$ $p < .001$	$B = 0.012$ [-0.092, 0.117] $t(11481) = 0.35$ $p = .723$	$B = 0.047$ [-0.058, 0.152] $t(11437) = 1.32$ $p = .185$	$B = -0.068$ [-0.173, 0.037] $t(11574) = -1.92$ $p = .054$	$B = 0.005$ [-0.100, 0.110] $t(11420) = 0.14$ $p = .885$

Note. Depicted are the between-person effects of the overall use index and the two alcohol indices on personality. 99.7% confidence intervals (corresponding to the adjusted significance threshold) are shown in parentheses. Effects printed in bold are significant. E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness, LS = life satisfaction, SE = self-esteem.

Table S55

Results of the multilevel models with the overall use index and the two alcohol indices predicting personality: Within-person effects.

	E	A	C	N	O	LS	SE
Overall use	B = -0.068 [-0.299, 0.161] $t(99)$ = -0.89 p = .373	B = -0.145 [-0.412, 0.113] $t(102)$ = -1.68 p = .096	B = -0.078 [-0.303, 0.150] $t(88)$ = -1.06 p = .293	**B = 0.213 [-0.023, 0.442] $t(97)$ = 2.83 p = .006**	B = 0.042 [-0.124, 0.209] $t(24133)$ = 0.75 p = .451	B = -0.048 [-0.341, 0.254] $t(90)$ = -0.50 p = .621	B = -0.186 [-0.437, 0.068] $t(101)$ = -2.23 p = .028
Alcohol frequency	B = -0.006 [-0.050, 0.038] $t(1205)$ = -0.43 p = .664	B = -0.025 [-0.074, 0.025] $t(23225)$ = -1.49 p = .135	B = -0.026 [-0.073, 0.020] $t(23049)$ = -1.68 p = .093	B = 0.001 [-0.045, 0.047] $t(23027)$ = 0.07 p = .944	B = 0.016 [-0.029, 0.062] $t(22968)$ = 1.07 p = .283	B = -0.015 [-0.068, 0.039] $t(23312)$ = -0.82 p = .412	B = -0.007 [-0.057, 0.044] $t(23080)$ = -0.38 p = .703
Heavy drinking episode	**B = 0.031 [-0.005, 0.067] $t(23068)$ = 2.52 p = .012**	B = 0.007 [-0.037, 0.050] $t(23720)$ = 0.46 p = .648	B = -0.011 [-0.052, 0.030] $t(23469)$ = -0.80 p = .422	B = 0.016 [-0.024, 0.057] $t(23436)$ = 1.19 p = .235	**B = 0.032 [-0.008, 0.072] $t(23355)$ = 2.40 p = .016**	B = 0.007 [-0.040, 0.054] $t(23827)$ = 0.42 p = .677	B = -0.007 [-0.053, 0.039] $t(1492)$ = -0.46 p = .649

Note. Depicted are the within-person effects of the overall use index and the two alcohol indices on personality. 99.7% confidence intervals (corresponding to the adjusted significance threshold) are shown in parentheses. Effects printed in bold are significant. E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness, LS = life satisfaction, SE = self-esteem.

Table S56
Results of the interactions between age group and the within-person effects of substance use

	E	A	C	N	O	LS	SE
Smoking	$B = 0.014$ [-0.155, 0.183] $t(1503) = 0.25$ $p = 1.000$	$B = -0.066$ [-0.273, 0.141] $t(1589) = -0.95$ $p = 1.000$	$B = -0.052$ [-0.246, 0.143] $t(1533) = -0.79$ $p = 1.000$	$B = 0.090$ [-0.094, 0.274] $t(1506) = 1.46$ $p = 1.000$	$B = 0.046$ [-0.131, 0.222] $t(1576) = 0.77$ $p = 1.000$	$B = -0.105$ [-0.325, 0.115] $t(1575) = -1.42$ $p = 1.000$	$B = -0.112$ [-0.314, 0.089] $t(1538) = -1.66$ $p = 1.000$
Alcohol heavy	$B = 0.105$ [-0.192, 0.402] $t(23700) = 1.05$ $p = 1.000$	$B = 0.136$ [-0.217, 0.489] $t(24756) = 1.14$ $p = 1.000$	$B = -0.227$ [-0.562, 0.107] $t(24335) = -2.02$ $p = 1.000$	$B = -0.267$ [-0.598, 0.063] $t(24277) = -2.40$ $p = .719$	$B = 0.093$ [-0.234, 0.419] $t(24164) = 0.84$ $p = 1.000$	$B = 0.071$ [-0.310, 0.453] $t(24916) = 0.56$ $p = 1.000$	$B = 0.031$ [-0.331, 0.392] $t(24549) = 0.25$ $p = 1.000$
Sedatives	$B = 0.021$ [-0.338, 0.379] $t(683) = 0.17$ $p = 1.000$	$B = 0.150$ [-0.246, 0.547] $t(807) = 1.13$ $p = 1.000$	$B = 0.319$ [-0.054, 0.692] $t(751) = 2.54$ $p = .711$	$B = 0.013$ [-0.379, 0.406] $t(748) = 0.10$ $p = 1.000$	$B = 0.027$ [-0.347, 0.402] $t(762) = 0.21$ $p = 1.000$	$B = 0.419$ [-0.081, 0.919] $t(738) = 2.49$ $p = .711$	$B = 0.049$ [-0.357, 0.456] $t(816) = 0.36$ $p = 1.000$
Soft drugs	$B = 0.006$ [-0.225, 0.239] $t(390) = 0.08$ $p = 1.000$	$B = -0.078$ [-0.346, 0.190] $t(424) = -0.86$ $p = 1.000$	$B = -0.114$ [-0.357, 0.129] $t(344) = -1.40$ $p = 1.000$	$B = 0.019$ [-0.216, 0.254] $t(384) = 0.24$ $p = 1.000$	$B = 0.016$ [-0.226, 0.258] $t(405) = 0.19$ $p = 1.000$	$B = -0.099$ [-0.423, 0.226] $t(441) = -0.91$ $p = 1.000$	$B = -0.045$ [-0.320, 0.230] $t(399) = -0.49$ $p = 1.000$
Ecstasy	$B = -0.037$ [-0.508, 0.439] $t(124) = -0.23$ $p = 1.000$	$B = -0.253$ [-0.766, 0.274] $t(120) = -1.46$ $p = 1.000$	$B = -0.042$ [-0.546, 0.474] $t(103) = -0.25$ $p = 1.000$	$B = 0.064$ [-0.446, 0.578] $t(125) = 0.38$ $p = 1.000$	$B = 0.117$ [-0.373, 0.622] $t(133) = 0.71$ $p = 1.000$	$B = -0.190$ [-0.635, 0.255] $t(24884) = -1.27$ $p = 1.000$	$B = -0.007$ [-0.517, 0.516] $t(113) = -0.04$ $p = 1.000$
Hallucinogens	$B = -0.326$ [-0.943, 0.290] $t(24624) = -1.57$ $p = 1.000$	$B = -0.798$ [-1.526, -0.070] $t(25991) = -3.25$ $p = .252$	$B = 0.094$ [-0.772, 1.050] $t(34) = 0.33$ $p = 1.000$	$B = 0.625$ [-0.059, 1.309] $t(25386) = 2.71$ $p = .711$	$B = -0.214$ [-0.890, 0.463] $t(25243) = -0.94$ $p = 1.000$	$B = -0.010$ [-0.797, 0.778] $t(26172) = -0.04$ $p = 1.000$	$B = -0.197$ [-0.944, 0.550] $t(25766) = -0.78$ $p = 1.000$

Hard drugs	$B = -0.117$ [-0.722, 0.505] $t(98) = -0.58$ $p = 1.000$	$B = -0.025$ [-0.698, 0.673] $t(91) = -0.11$ $p = 1.000$	$B = -0.346$ [-0.811, 0.119] $t(24477) = -2.21$ $p = .998$	$B = 0.138$ [-0.460, 0.760] $t(85) = 0.68$ $p = 1.000$	$B = -0.226$ [-0.772, 0.333] $t(107) = -1.23$ $p = 1.000$	$B = 0.175$ [-0.355, 0.705] $t(25122) = 0.98$ $p = 1.000$	$B = -0.048$ [-0.747, 0.647] $t(87) = -0.21$ $p = 1.000$

Note. Depicted are the interactions between the within-person effects and age-group ("1" if participants are 24 years old or younger and "0" otherwise). The reported *p*-values were corrected to control the false discovery rate. 99.7% confidence intervals (corresponding to the adjusted significance threshold) are shown in parentheses. E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness, LS = life satisfaction, SE = self-esteem.

Table S57
Within-person effects for emerging adults only

	E	A	C	N	O	LS	SE
Smoking	B = 0.09 [-0.08, 0.27] p = .113	B = 0.01 [-0.19, 0.21] p = .905	B = -0.08 [-0.27, 0.11] p = .207	B = 0.00 [-0.19, 0.19] p = .956	B = 0.06 [-0.13, 0.25] p = .349	B = -0.07 [-0.29, 0.15] p = .349	B = -0.03 [-0.22, 0.17] p = .674
Alcohol heavy	B = 0.16 [-0.21, 0.52] p = .104	B = 0.14 [-0.27, 0.56] p = .851	B = -0.34 [-0.73, 0.05] p = .004	B = -0.21 [-0.60, 0.19] p = .941	B = 0.10 [-0.30, 0.50] p = .446	B = 0.02 [-0.43, 0.48] p = .563	B = -0.02 [-0.43, 0.38] p = .871
Sedatives	B = -0.12 [-0.52, 0.29] p = .393	B = 0.18 [-0.27, 0.63] p = .247	B = 0.35 [-0.08, 0.78] p = .015	B = 0.08 [-0.36, 0.51] p = .598	B = 0.09 [-0.35, 0.53] p = .530	B = 0.45 [-0.04, 0.95] p = .007	B = 0.00 [-0.45, 0.44] p = .988
Soft drugs	B = 0.00 [-0.19, 0.19] p = .493	B = -0.01 [-0.23, 0.20] p = .841	B = -0.16 [-0.36, 0.04] p = .019	B = 0.03 [-0.17, 0.24] p = .636	B = -0.01 [-0.22, 0.20] p = .565	B = -0.10 [-0.34, 0.14] p = .105	B = -0.08 [-0.30, 0.13] p = .237
Ecstasy	B = -0.15 [-0.47, 0.18] p = .175	B = -0.22 [-0.59, 0.14] p = .071	B = -0.14 [-0.48, 0.20] p = .228	B = 0.11 [-0.24, 0.45] p = .369	B = 0.03 [-0.33, 0.38] p = .828	B = -0.05 [-0.45, 0.36] p = .732	B = -0.14 [-0.50, 0.22] p = .240
Hallucinogens	B = -0.17 [-0.62, 0.29] p = .274	B = -0.50 [-1.01, 0.00] p = .003	B = -0.37 [-0.85, 0.11] p = .022	B = 0.20 [-0.29, 0.69] p = .221	B = -0.08 [-0.57, 0.41] p = .686	B = 0.16 [-0.40, 0.72] p = .389	B = -0.11 [-0.61, 0.39] p = .508
Hard drugs	B = -0.16 [-0.57, 0.24] p = .237	B = -0.33 [-0.79, 0.12] p = .029	B = -0.30 [-0.73, 0.13] p = .036	B = 0.12 [-0.32, 0.55] p = .433	B = -0.29 [-0.73, 0.15] p = .051	B = 0.15 [-0.36, 0.65] p = .383	B = -0.18 [-0.63, 0.26] p = .221

Note. Depicted are the within person effects for participants that are 24 years old or younger. The reported *p*-values are unadjusted and the significance threshold corresponds to the threshold from the main analyses ($\alpha = .003$). None of the tests surpassed this threshold. 99.7% confidence intervals (corresponding to the adjusted significance threshold) are shown in parentheses. E = extraversion, A = agreeableness, C = conscientiousness, N = neuroticism, O = openness, LS = life satisfaction, SE = self-esteem.

Table S58
Measurement invariance analyses

Personality variable	No constraints	Equal loadings	Equal loadings and intercepts
E	CFI=0.945 RMSEA=0.024	CFI=0.945 RMSEA=0.024 ΔCFI=-4e-04 ΔRMSEA=-3e-04	CFI=0.943 RMSEA=0.024 ΔCFI=-0.0020 ΔRMSEA=-2e-04
A	CFI=0.956 RMSEA=0.019	CFI=0.956 RMSEA=0.018 ΔCFI=0.0000 ΔRMSEA=-3e-04	CFI=0.954 RMSEA=0.018 ΔCFI=-0.0014 ΔRMSEA=-2e-04
C	CFI=0.936 RMSEA=0.022	CFI=0.935 RMSEA=0.022 ΔCFI=-3e-04 ΔRMSEA=-3e-04	CFI=0.933 RMSEA=0.022 ΔCFI=-0.0023 ΔRMSEA=-2e-04
N	CFI=0.917 RMSEA=0.030	CFI=0.916 RMSEA=0.030 ΔCFI=-4e-04 ΔRMSEA=-4e-04	CFI=0.915 RMSEA=0.030 ΔCFI=-0.0021 ΔRMSEA=-5e-04
O	CFI=0.904 RMSEA=0.028	CFI=0.904 RMSEA=0.028 ΔCFI=0.0000 ΔRMSEA=-4e-04	CFI=0.903 RMSEA=0.027 ΔCFI=-0.0016 ΔRMSEA=-6e-04
SE	CFI=0.867 RMSEA=0.040	CFI=0.867 RMSEA=0.040 ΔCFI=-4e-04 ΔRMSEA=-5e-04	CFI=0.865 RMSEA=0.039 ΔCFI=-0.0020 ΔRMSEA=-8e-04
LS	CFI=0.981 RMSEA=0.026	CFI=0.980 RMSEA=0.026 ΔCFI=-3e-04 ΔRMSEA=-6e-04	CFI=0.980 RMSEA=0.025 ΔCFI=-9e-04 ΔRMSEA=-9e-04

Note. ΔCFI and ΔRMSEA indicate the changes in CFI and RMSEA compared to the model without constraints. Large decreases in CFI and increases in RMSEA would indicate worse model fit in more restricted models.

Measurement invariance

Separate structural equation models were fit for each personality variable with the following specifications: (1) One personality factor for each wave with items from the same wave loading on it, (2) free correlations between wave-specific personality factors, and (3) free residual correlations of the same items across time. In the unconstrained model, the intercept and loading of the first item was fixed across waves and the intercept and variance of the first personality factor was set to 0 and 1, respectively. All other loadings and intercepts were estimated freely. In the second model, all item loadings were constrained across waves. Finally, in the third model, both item loadings and intercepts were constrained across waves. In order to account for missingness, we used full information maximum likelihood (FIML) estimation. The analyses were restricted to waves with sufficient participant overlap ($> 15\%$) with other assessment waves. This led to the inclusion of waves 1,2,4,6,7, and 9 only. Measurement invariance was assessed as the difference in CFI and RMSEA between the restricted and unrestricted models. Following the guidelines from Chen (2007), invariance was not rejected if CFI decreased by less than .010 and RMSEA increased by less than .015 in more restricted models. In line with these suggestions, our results indicate strong measurement invariance (all ΔCFI $> -.003$ & ΔRSMSEA < 0). The code for the measurement invariance analyses can be found on our OSF-page (https://bit.ly/2HSMWZ9).

Table S59
Latent state-trait analyses

Trait	Fit	Trait Variance	State Variance
E	CFI=0.943 RMSEA=0.024	Var= 87.03% $Z = 35.37, p <.001$	Var= 12.97% $Z_{min} = 15.30, p <.001$
A	CFI=0.953 RMSEA=0.019	Var= 80.68% $Z = 36.01, p <.001$	Var= 19.32% $Z_{min} = 11.87, p <.001$
C	CFI=0.935 RMSEA=0.022	Var= 77.02% $Z = 20.19, p <.001$	Var= 22.98% $Z_{min} = 11.62, p <.001$
N	CFI=0.919 RMSEA=0.029	Var= 78.86% $Z = 48.88, p <.001$	Var= 21.14% $Z_{min} = 17.55, p <.001$
O	CFI=0.909 RMSEA=0.027	Var= 85.03% $Z = 30.17, p <.001$	Var= 14.97% $Z_{min} = 10.48, p <.001$
SE	CFI=0.877 RMSEA=0.038	Var= 67.35% $Z = 32.37, p <.001$	Var= 32.65% $Z_{min} = 28.27, p <.001$
LS	CFI=0.980 RMSEA=0.026	Var= 71.12% $Z = 52.62, p <.001$	Var= 28.88% $Z_{min} = 29.69, p <.001$

Note. Var indicates the relative proportion of reliable state and trait variance, averaged across items. Z_{min} indicates the smallest Z-value for all occasion-specific variance estimates for the respective trait.

Latent state-trait models

In order to ensure that our personality variables showed reliable variance across waves (in addition to a stable trait factor and measurement error), we computed separate latent state-trait models (LST; Steyer, Ferring, & Schmitt, 1992) for each trait. The models were specified as follows: (1) An occasion-specific personality factor for each wave on which all items for the respective wave load, (2) an overall trait factor on which all items load (bifactor LST), and (3) correlated residuals for the same items across time. The loadings of items were constrained to be equal across waves for both the occasion-specific factors and the trait factor. All occasion-specific variances were estimated freely. In order to determine the relative amount of reliable state and trait variance, the state and trait variance was computed for each item and divided by the sum of its state and trait variance, respectively. These variance estimates were averaged across all items for each trait. Our results indicated that all occasion-specific factors evidenced substantial reliable variance (M = 21.84%; range: 12.97% for extraversion to 32.65% for self-esteem, all p's <.001). The code for the latent state-trait models can be found on our OSF-page (https://bit.ly/2HSMWZ9).