

Supplementary Information

Results

Table S1

Linear regression nested models for complete cases dataset displaying difference in IQ age 15 (SE) estimated between each cannabis user group compared to never users.

Cumulative cannabis use	IQ1	IQ2	IQ3	IQ4	IQ5a	IQ5b	IQ5c	IQ6
<5 times	-1.8 (1.0)*	-2.1 (0.8)***	-1.7 (0.8)**	-1.7 (0.8)**	-0.5 (0.9)	-1.2 (0.8)	-1.6 (0.8)*	-0.2 (0.9)
5-19 times	-1.6 (1.3)	-2.7 (1.1)**	-2.8 (1.1)***	-2.9 (1.1)***	-1.0 (1.2)	-2.4 (1.1)**	-2.6 (1.1)**	-0.9 (1.2)
20-49 times	-2.1 (1.8)	-3.3 (1.5)**	-3.1 (1.5)**	-3.3 (1.5)**	-1.0 (1.6)	-2.8 (1.5)*	-2.8 (1.5)*	-0.8 (1.7)
≥50 times	-1.6 (1.8)	-2.9 (1.4)**	-2.5 (1.4)*	-2.7 (1.4)*	-0.2(1.7)	-1.4 (1.6)	-2.1 (1.6)	-0.1 (1.8)

* two-tailed t-tests, compared to never-users (p<.1)

** two-tailed t-tests, compared to never-users (p<.05)

*** two-tailed t-tests, compared to never-users (p<.01)

Model IQ1: Adjusted only by cumulative cannabis use at age 15

Model IQ2: As model 1 plus adjustment for full-scale IQ age 8

Model IQ3: As model 2 plus adjustment for maternal, early-life, and behavioural factors

Model IQ4: As model 3 plus adjustment for depressive symptoms and psychotic-like experiences

Model IQ5a: As model 4 plus adjustment for cumulative cigarette use at age 15

Model IQ5b: As model 4 plus adjustment for cumulative alcohol use at age 15

Model IQ5c: As model 4 plus adjustment for other recreational drug use at age 15

Model IQ6: As model 4 plus adjustment for cumulative cigarette use, cumulative alcohol use, and other recreational drug use at age 15

Table S2

Linear regression nested models for complete cases dataset displaying difference in educational performance age 16 (SE) estimated between each cannabis user group compared to never users.

Cumulative cannabis use	Ed1	Ed2	Ed3	Ed4	Ed5a	Ed5b	Ed5c	Ed6
<5 times	-2.9 (0.9)***	-3.1 (0.6)***	-2.7 (0.6)***	-2.7 (0.6)***	-0.7 (0.6)	-2.0 (0.6)***	-2.4 (0.6)***	-0.4 (0.6)
5-19 times	-4.3 (1.2)***	-4.4 (0.8)***	-4.0 (0.8)***	-4.0 (0.8)***	-0.7 (0.9)	-3.1 (0.8)***	-3.1 (0.8)***	-0.2 (0.9)
20-49 times	-8.0 (1.6)***	-5.6 (1.1)***	-4.3 (1.0)***	-4.3 (1.0)***	0.2 (1.1)	-3.2 (1.1)***	-2.6 (1.1)**	1.2 (1.2)
≥50 times	-11.6 (1.5)***	-11.0 (1.1)***	-9.4 (1.0)***	-9.3 (1.0)***	-3.4 (1.2)***	-7.9 (1.1)***	-6.9 (1.1)***	-2.2 (1.3)*

* two-tailed t-tests, compared to never-users (p<.1)

** two-tailed t-tests, compared to never-users (p<.05)

*** two-tailed t-tests, compared to never-users (p<.01)

Model Ed1: Adjusted only by cumulative cannabis use at age 15

Model Ed2: As model 1 plus adjustment for educational performance age 11

Model Ed3: As model 2 plus adjustment for maternal, early-life, and behavioural factors

Model Ed4: As model 3 plus adjustment for depressive symptoms and psychotic-like experiences

Model Ed5a: As model 4 plus adjustment for cumulative cigarette use at age 15

Model Ed5b: As model 4 plus adjustment for cumulative alcohol use at age 15

Model Ed5c: As model 4 plus adjustment for other recreational drug use at age 15

Model Ed6: As model 4 plus adjustment for cumulative cigarette use, cumulative alcohol use, and other recreational drug use at age 15

Table S3

Fully adjusted model for complete cases dataset displaying difference in IQ age 15 estimated between each cigarette user group compared to never users.

Cumulative cigarette use	Adj. coef.	SE	t	p	95% Cis	
					Lower	Upper
1-4 times	-0.85	1.06	-0.80	0.43	-2.93	1.23
5-20 times	-1.81	1.10	-1.64	0.10	-3.97	0.36
21-60 times	-2.55	1.23	-2.07	0.04	-4.97	-0.13
61-100 times	-3.79	1.75	-2.16	0.03	-7.23	-0.35
>100 times	-3.22	1.36	-2.36	0.02	-5.89	-0.55

Table S4

Fully adjusted model for complete cases dataset displaying difference in educational performance age 16 estimated between each cigarette user group compared to never users.

Cumulative cigarette use	Adj. coef.	SE	t	p	95% Cis	
					Lower	Upper
1-4 times	-0.69	0.75	-0.93	0.35	-2.16	0.77
5-20 times	-1.39	0.78	-1.80	0.07	-2.92	0.13
21-60 times	-3.29	0.87	-3.79	0.00	-4.99	-1.59
61-100 times	-5.32	1.23	-4.32	0.00	-7.73	-2.90
>100 times	-7.35	0.95	-7.72	0.00	-9.22	-5.49

Table S5

Analyses comparing participants who were included in the complete case analysis to those with missing data. Total number of cases with missing data varies by variable due to varying degrees of missingness.

	Complete case		Cases with missing data		p-value
	N	%	N	%	
Female	1194	53.4	5955	47.8	<0.001
Mother has higher education	1113	49.8	3279	32.2	<0.001
Mother used cannabis in first 3 months of pregnancy	37	1.7	280	2.7	0.003
Mother in trouble with the law in 8 months following birth	4	0.2	48	0.5	0.029
Moved house after the child was born	215	9.8	1326	15.2	<0.001
Teacher reports child has played truant at age 10-11 years-old	0	0.0	124	2.0	<0.001
	Mean	SE	Mean	SE	p-value
IQ age 8	100.0	0.3	93.3	0.2	<0.001
Maternal depression during pregnancy and up to 8 months old	3.6	0.0	4.1	0.0	<0.001

Table S6

Linear regression nested models for imputed dataset displaying difference in IQ age 15 (SE) estimated between each cannabis user group compared to never users.

	IQ1i	IQ2i	IQ3i	IQ4i	IQ5ai	IQ5bi	IQ5ci	IQ6i
<5 times	-2.1 (0.7)***	-1.6 (0.5)***	-1.3 (0.5)***	-1.4 (0.5)***	-0.4 (0.5)	-0.9 (0.5)*	-1.3 (0.5)**	-0.2 (0.5)
5-19 times	-1.8(0.8)**	-2.0 (0.7)***	-1.5 (0.6)***	-1.6 (0.6)***	-0.0 (0.6)	-0.9 (0.6)	-1.4 (0.6)**	0.2 (0.6)
20-49 times	-2.7 (1.3)**	-2.5 (0.9)***	-1.8 (0.9)**	-1.9 (0.9)**	-0.1 (0.9)	-1.1 (1.0)	-1.6 (0.9)*	0.3 (0.9)
≥50 times	-3.1 (1.2)**	-2.8 (0.9)***	-1.9 (0.9)**	-2.0 (0.9)**	-0.4 (1.0)	-1.2 (0.9)	-1.5 (0.9)	0.6 (0.9)

* two-tailed t-tests, compared to never-users (p<.1)
** two-tailed t-tests, compared to never-users (p<.05)
*** two-tailed t-tests, compared to never-users (p<.01)

Model IQ1i: Adjusted only by cumulative cannabis use at age 15
Model IQ2i: As model 1i plus adjustment for full-scale IQ age 8
Model IQ3i: As model 2i plus adjustment for maternal, early-life, and behavioural factors
Model IQ4i: As model 3i plus adjustment for depressive symptoms and psychotic-like experiences
Model IQ5ai: As model 4i plus adjustment for cumulative cigarette use at age 15
Model IQ5bi: As model 4i plus adjustment for cumulative alcohol use at age 15
Model IQ5ci: As model 4i plus adjustment for other recreational drug use at age 15
Model IQ6i: As model 4i plus adjustment for cumulative cigarette use, cumulative alcohol use, and other recreational drug use at age 15

Table S7

Linear regression nested models for imputed dataset displaying difference in educational performance age 16 (SE) estimated between each cannabis user group compared to never users.

	Ed1i	Ed2i	Ed3i	Ed4i	Ed5ai	Ed5bi	Ed5ci	Ed6i
<5 times	-3.7 (0.9)***	-2.2 (0.5)***	-1.4 (0.5)***	-1.4 (0.5)***	-0.1 (0.5)	-1.3 (0.5)**	-1.2 (0.5)**	-0.2 (0.5)
5-19 times	-5.4 (1.2)***	-4.3 (0.9)***	-3.0 (0.9)***	-3.0 (0.9)***	-0.5 (1.0)	-2.8 (0.9)***	-2.6 (0.9)***	-0.6 (1.0)
20-49 times	-7.3 (1.5)***	-4.7 (1.0)***	-2.8 (0.9)***	-2.8 (0.9)***	0.4 (1.0)	-2.5 (1.0)**	-2.1 (0.9)**	0.2 (1.0)
≥50 times	-10.9 (1.4)***	-8.3 (0.8)***	-5.1 (0.8)***	-5.1 (0.8)***	-1.1 (1.0)	-4.7 (1.0)***	-4.2 (0.9)***	-1.3 (1.1)

* two-tailed t-tests, compared to never-users (p<.1)

** two-tailed t-tests, compared to never-users (p<.05)

*** two-tailed t-tests, compared to never-users (p<.01)

Model Ed1i: Adjusted only by cumulative cannabis use at age 15

Model Ed2i: As model 1i plus adjustment for educational performance age 11

Model Ed3i: As model 2i plus adjustment for maternal, early-life, and behavioural factors

Model Ed4i: As model 3i plus adjustment for depressive symptoms and psychotic-like experiences

Model Ed5ai: As model 4i plus adjustment for cumulative cigarette use at age 15

Model Ed5bi: As model 4i plus adjustment for cumulative alcohol use at age 15

Model Ed5ci: As model 4i plus adjustment for other recreational drug use at age 15

Model Ed6i: As model 4i plus adjustment for cumulative cigarette use, cumulative alcohol use, and other recreational drug use at age 15

Figure S1.

Study participant flow diagram

