

Appendix 1. Response rates and sample sizes at each wave of the LSYPE

	Wave 1	Wave 2	Wave 3	Wave 4	Wave 4 Boost	Wave 5	Wave 6	Wave 7
Issued sample	21,000	15,678	13,525	12,468	600	11,793	11,225	9,791
Achieved sample	15,770	13,539	12,439	11,449	352	10,430	9,799	8,682
Response rate	74%	86%	92%	92%	59%	88%	87%	90%

Appendix 2. Descriptive statistics for study variables according to substance use in later adolescence (age 18/19 to 19/20, unweighted)

Study variables	Regular alcohol drinking				Cannabis use				Total (N = 6,059)
	Absent (N = 1,334, 22.02%)	Occasional (N = 679, 11.21%)	Persistent (N = 4,046, 66.78%)	p	Absent (N = 3,920, 65.36%)	Occasional (N = 1,126, 18.58%)	Persistent (N = 973, 16.06%)	p	
Age, M(SD)	14.26 (0.31)	14.25 (0.30)	14.23 (0.31)	<0.001	14.24 (0.31)	14.24 (0.31)	14.23 (0.31)	0.578	14.24 (0.31)
Academic ability score, M(SD)	26.42 (4.11)	26.79 (3.92)	28.52 (3.38)	<0.001	27.43 (3.88)	28.49 (3.34)	28.89 (3.20)	<0.001	27.86 (3.73)
Female, N(%)	763 (57.20)	401 (59.06)	1,929 (47.68)	<0.001	2,198 (55.51)	543 (48.22)	352 (36.18)	<0.001	3,093 (51.05)
Longstanding illness, disability or infirmity, N(%)	127 (9.52)	97 (14.29)	539 (13.32)	0.001	483 (12.20)	158 (14.03)	122 (12.54)	0.261	763 (12.59)
Ethnic minority¶, N(%)	946 (70.91)	200 (29.46)	579 (14.31)	<0.001	1,359 (34.32)	190 (16.87)	176 (18.09)	<0.001	1,725 (28.47)
Parental occupation (non-professional), N(%)	994 (74.51)	427 (62.89)	1,867 (46.14)	<0.001	2,321 (58.61)	530 (47.07)	437 (44.91)	<0.001	3,288 (54.27)
Parental education (non-degree level), N(%)	1,191 (89.28)	592 (87.19)	3,183 (78.67)	<0.001	3,360 (84.85)	904 (80.28)	702 (72.15)	<0.001	4,966 (81.96)

¶Unweighted frequency (ethnic minority groups were over-sampled). p for linear trend.

Appendix 3. Association between academic ability at age 11 and substance use across adolescence, excluding substance users at age 13/14 (risk ratios and 95% confidence intervals, weighted for survey design)

Academic ability	Onset of substance use in early adolescence (age 13 to 17)				Persistence of substance use in later adolescence (age 18 to 20)			
	Occasional cigarette smoking[†]		Persistent cigarette smoking[†]		Occasional cigarette smoking		Persistent cigarette smoking	
	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b
Medium (vs. low)	0.91 (0.65-1.25) ✕	0.90 (0.65-1.25) ✕	0.75 (0.49-1.13) ✕	0.75 (0.49-1.17) ✕				
High (vs. low)	0.86 (0.62-1.21) ✕	0.89 (0.63-1.24) ✕	0.50 (0.32-0.78)	0.53 (0.32-0.88)				
	Occasional regular alcohol use[‡]		Persistent regular alcohol use[‡]		Occasional regular alcohol use[•]		Persistent regular alcohol use[•]	
Medium (vs. low)	1.54 (1.30-1.83)	1.32 (1.09-1.59)	2.37 (1.84-3.05)	2.08 (1.60-2.70)	0.92 (0.69-1.22) ✕	0.84 (0.62-1.14) ✕	1.92 (1.57-2.35)	1.51 (1.21-1.89)
High (vs. low)	1.58 (1.33-1.88)	1.26 (1.03-1.54)	2.52 (1.99-3.20)	2.09 (1.62-2.70)	0.94 (0.70-1.26) ✕	0.87 (0.63-1.21) ✕	2.84 (2.32-3.48)	2.07 (1.64-2.61)
	Occasional cannabis use[‡]		Persistent cannabis use[‡]		Occasional cannabis use[•]		Persistent cannabis use[•]	
Medium (vs. low)	1.33 (1.09-1.61)	1.25 (1.02-1.53)	1.61 (1.14-2.27)	1.49 (1.04-2.12)	1.62 (1.30-2.03)	1.45 (1.16-1.83)	1.83 (1.41-2.37)	1.64 (1.26-2.14)
High (vs. low)	1.07 (0.87-1.30) ✕	0.98 (0.79-1.22) ✕	1.27 (0.90-1.79) ✕	1.12 (0.78-1.61) ✕	1.87 (1.48-2.37)	1.57 (1.23-2.02)	2.20 (1.72-2.81)	1.80 (1.40-2.32)

^aAdjusted for age and sex. ^bAdditionally adjusted for longstanding disability/illness/infirmity, ethnic group, parental occupational social class & parental education.

[†]Represents substance use data at age 14/15 (2005) to 15/16 (2006).

[‡]Represents substance use data at age 14/15 (2005) to 16/17 (2007).

[•]Represents substance use data at age 18/19 (2009) to 19/20 (2010).

⌘Represents significance level: p>0.05.

Appendix 4. Association between academic ability at age 11 and substance use in early adolescence, including participants lost to follow-up age 18/20 (risk ratios and 95% confidence intervals, weighted for survey design)

N = 8,224

Onset of substance use in early adolescence (age 13 to 17)

Academic ability	Occasional cigarette smoking†		Persistent cigarette smoking†	
	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b
Medium (vs. low)	0.98 (0.80-1.21) ⌘	0.98 (0.80-1.21) ⌘	0.88 (0.73-1.06) ⌘	0.90 (0.74-1.09) ⌘
High (vs. low)	0.87 (0.71-1.07) ⌘	0.91 (0.74-1.12) ⌘	0.56 (0.46-0.67) ⌘	0.61 (0.50-0.75) ⌘
	Occasional regular alcohol use‡		Persistent regular alcohol use‡	
Medium (vs. low)	1.50 (1.30-1.72)	1.35 (1.16-1.57)	2.08 (1.77-2.44)	1.88 (1.58-2.23)
High (vs. low)	1.49 (1.29-1.72)	1.23 (1.04-1.44)	2.32 (1.99-2.72)	1.92 (1.62-2.28)
	Occasional cannabis use‡		Persistent cannabis use‡	
Medium (vs. low)	1.17 (1.01-1.36)	1.15 (0.98-1.34)	1.56 (1.32-1.90)	1.54 (1.28-1.85)
High (vs. low)	1.02 (0.88-1.18) ⌘	1.00 (0.85-1.17) ⌘	1.32 (1.11-1.57)	1.26 (1.05-1.51)

^aAdjusted for age and sex. ^bAdditionally adjusted for longstanding disability/illness/infirmity, ethnic group, parental occupational social class & parental education.

†Represents substance use data at age 14/15 (2005) to 15/16 (2006).

‡Represents substance use data at age 14/15 (2005) to 16/17 (2007).

⌘Represents significance level: p>0.05.

Appendix 5. Association between academic ability at age 11 and substance use across adolescence, excluding late onset users (age 18 to 20) (risk ratios and 95% confidence intervals, weighted for survey design)

N = 5,376	Onset of substance use in early adolescence (age 13 to 17)				Persistence of substance use in later adolescence (age 18 to 20)			
	Occasional cigarette smoking [†]		Persistent cigarette smoking [†]		Occasional cigarette smoking		Persistent cigarette smoking	
Academic ability	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b
Medium (vs. low)	0.98 (0.75-1.27) ✕	0.97 (0.74-1.27) ✕	0.87 (0.68-1.11) ✕	0.87 (0.68-1.13) ✕				
High (vs. low)	0.95 (0.74-1.23) ✕	0.99 (0.76-1.29) ✕	0.61 (0.47-0.78)	0.65 (0.49-0.85)				
	Occasional regular alcohol use [‡]		Persistent regular alcohol use [‡]		Occasional regular alcohol use [•]		Persistent regular alcohol use [•]	
Medium (vs. low)	1.51 (1.27-1.79)	1.30 (1.08-1.57)	2.00 (1.64-2.43)	1.72 (1.40-2.12)	0.84 (0.62-1.14) ✕	0.73 (0.53-1.02) ✕	1.89 (1.56-2.28)	1.49 (1.20-1.84)
High (vs. low)	1.39 (1.17-1.66)	1.14 (0.93-1.39) ✕	2.05 (1.69-2.49)	1.68 (1.36-2.09)	0.86 (0.61-1.20) ✕	0.79 (0.55-1.14) ✕	2.86 (2.36-3.46)	2.12 (1.70-2.64)
	Occasional cannabis use [‡]		Persistent cannabis use [‡]		Occasional cannabis use [•]		Persistent cannabis use [•]	
Medium (vs. low)	1.30 (1.09-1.54)	1.24 (1.04-1.48)	1.63 (1.32-2.02)	1.54 (1.23-1.91)	1.46 (1.17-1.82)	1.38 (1.11-1.73)	1.94 (1.58-2.39)	1.77 (1.44-2.18)
High (vs. low)	1.17 (0.99-1.39) ✕	1.11 (0.92-1.33) ✕	1.42 (1.14-1.76)	1.28 (1.02-1.61)	1.36 (1.08-1.71)	1.27 (0.99-1.62) ✕	2.26 (1.86-2.75)	1.85 (1.51-2.27)

^aAdjusted for age and sex. ^bAdditionally adjusted for longstanding disability/illness/infirmity, ethnic group, parental occupational social class & parental education.

[†]Represents substance use data at age 14/15 (2005) to 15/16 (2006).

[‡]Represents substance use data at age 14/15 (2005) to 16/17 (2007).

[•]Represents substance use data at age 18/19 (2009) to 19/20 (2010).

☒Represents significance level: $p>0.05$.

Appendix 6. Association between academic ability at age 11 and hazardous alcohol use in later adolescence (age 18 to 20) (risk ratios and 95% confidence intervals, weighted for survey design)

Academic ability	Hazardous alcohol drinking (age 18 to 19)		Hazardous alcohol drinking (age 19 to 20)	
	Minimally adjusted ^a	Additionally adjusted ^b	Minimally adjusted ^a	Additionally adjusted ^b
Medium (vs. low)	0.37 (0.22-0.52)	0.28 (0.12-0.44)	0.59 (0.43-0.75)	0.50 (0.34-0.66)
High (vs. low)	0.66 (0.50-0.82)	0.48 (0.32-0.65)	0.95 (0.78-1.11)	0.76 (0.58-0.93)

^aAdjusted for age and sex. ^bAdditionally adjusted for longstanding disability/illness/infirmity, ethnic group, parental occupational social class & parental education.

☒Represents significance level: $p>0.05$.