Supplemental Information

Table S1. Lipid levels by *APOE* genotype in males

Genotype	N	Total cholesterol (mmol/l)				LDL cholesterol (mmol/l)				HDL cholesterol (mmol/l)				Triglyceride[c] (mmol/l)				
		Mean (SD)	Coeff[a]	95% CI	p[b]	Mean (SD)	Coeff[a]	95% CI	p[b]	Mean (SD)	Coeff[a]	95% CI	p[b]	Geometric mean	(IQR)	Coeff[a]	95% CI	p[b]
ε2/ε2	14	3.52 (0.64)	-0.65	(-0.99 to -0.32)		1.33 (0.68)	-0.92	(-1.21 to -0.63)		1.56 (0.51)	0.13	(-0.03 to 0.30)		1.30	(0.94-1.86)	1.34	(1.06 to 1.68)	
ε2/ε3	231	3.92 (0.55)	-0.26	(-0.35 to -0.17)		1.89 (0.46)	-0.36	(-0.44 to -0.28)		1.52 (0.31)	0.08	(0.04 to 0.13)		1.03	(0.77-1.34)	1.06	(0.99 to 1.13)	
ε2/ε4	41	4.06 (0.75)	-0.12	(-0.32 to 0.08)		2.02 (0.61)	-0.23	(-0.40 to -0.06)		1.48 (0.39)	0.05	(-0.05 to 0.15)		1.07	(0.91-1.27)	1.11	(0.97 to 1.27)	
ε3/ε3	885	4.18 (0.65)	0	-		2.26 (0.56)	0	-		1.43 (0.31)	0	-		0.97	(0.72- 1.30)	0	-	
ε3/ε4	380	4.36 (0.64)	0.19	(0.11 to 0.26)		2.46 (0.56)	0.20	(0.14 to 0.27)		1.39 (0.31)	-0.04	(-0.08 to -0.003)		1.02	(0.75-1.35)	1.05	(1.00 to 1.11)	
ε4/ε4	30	4.62 (0.57)	0.44	(0.21 to 0.67)	<0.0001	2.73 (0.49)	0.47	(0.27 to 0.67)	<0.0001	1.27 (0.23)	-0.16	(-0.27 to -0.04)	<0.0001	1.26	(0.95-1.77)	1.30	(1.11 to 1.53)	0.001

Table S2. Lipid levels by *APOE* genotype in females

Genotype	N	Total cholesterol (mmol/l)				LDL cholesterol (mmol/l)				HDL cholesterol (mmol/l)				Triglyceride[c] (mmol/l)				
		Mean (SD)	Coeff[a]	95% CI	p[b]	Mean (SD)	Coeff[a]	95% CI	p[b]	Mean (SD)	Coeff[a]	95% CI	p[b]	Geometric mean	(IQR)	Coeff[a]	95% CI	p[b]
ε2/ε2	12	3.70 (0.67)	-0.63	(-0.97 to -0.28)		1.44 (0.66)	-1.00	(-1.32 to -0.69)		1.54 (0.36)	0.18	(0.008 to 0.34)		1.40	(0.99-1.89)	1.35	(1.06 to 1.71)	
ε2/ε3	151	4.00 (0.62)	-0.34	(-0.44 to -0.23)		2.04 (0.51)	-0.40	(-0.50 to -0.31)		1.43 (0.35)	0.06	(0.01 to 0.12)		1.06	(0.81-1.4)	1.02	(0.95 to 1.10)	
ε2/ε4	33	4.31 (0.46)	-0.02	(-0.23 to 0.20)		2.30 (0.39)	-0.15	(-0.34 to 0.04)		1.41 (0.33)	0.05	(-0.06 to 0.15)		1.22	(1.05-1.41)	1.17	(1.01 to 1.36)	
ε3/ε3	741	4.33 (0.64)	0	-		2.45 (0.56)	0	-		1.36 (0.30)	0	-		1.04	(0.77-1.35)	0	-	
ε3/ε4	329	4.42 (0.60)	0.09	(0.005 to 0.17)		2.56 (0.55)	0.12	(0.05 to 0.19)		1.29 (0.27)	-0.07	(-0.11 to -0.03)		1.13	(0.84-1.51)	1.09	(1.03 to 1.15)	
ε4/ε4	28	4.67 (0.58)	0.34	(0.10 to 0.57)	<0.0001	2.71 (0.57)	0.26	(0.05 to 0.47)	<0.0001	1.35 (0.21)	-0.02	(-0.13 to 0.10)	<0.0001	1.25	(1.01-1.50)	1.20	(1.03 to 1.41)	0.0006

[a] Coefficient from linear regression adjusted for age with ε3/ε3 genotype as reference group

[b] P values for heterogeneity from analysis of covariance model

[c] Triglycerides are log transformed so coefficients represent ratio of geometric means

Table S3. Associations of lipids (in quartiles) with IQ

All children (N = 3713)

	Quartile	Age, sex adjusted Coeff[a] (IQ points)	95% CI		P	Quartile	All adjusted[b] Coeff[a] (IQ points)	95% CI		P
Total cholesterol	1	-	-		-	1	-	-		-
	2	-0.48	(-1.93,	0.97)	0.52	2	-0.13	(-1.47,	1.21)	0.85
	3	-0.31	(-1.75,	1.13)	0.67	3	0.26	(-1.07,	1.59)	0.70
	4	-1.03	(-2.49,	0.42)	0.16	4	-0.60	(-1.94,	0.74)	0.38
LDL	1	-	-		-	1	-	-		-
	2	-1.83	(-3.29,	-0.38)	0.01	2	-1.17	(-2.51,	0.17)	0.09
	3	-0.64	(-2.10,	0.82)	0.39	3	-0.21	(-1.56,	1.14)	0.76
	4	-1.52	(-2.99,	-0.05)	0.04	4	-0.83	(-2.18,	0.53)	0.23
HDL	1	-	-		-	1	-	-		-
	2	0.61	(-0.82,	2.05)	0.40	2	0.14	(-1.18,	1.46)	0.84
	3	-0.0005	(-1.46,	1.46)	1.00	3	-0.23	(-1.57,	1.12)	0.74
	4	0.31	(-1.15,	1.77)	0.68	4	-0.05	(-1.40,	1.30)	0.94
Triglycerides	1	-	-		-	1	-	-		-
	2	1.45	(-0.004,	2.90)	0.05	2	0.84	(-0.50,	2.18)	0.22
	3	0.75	(-0.70,	2.20)	0.31	3	0.20	(-1.14,	1.54)	0.77
	4	0.62	(-0.84,	2.08)	0.40	4	0.44	(-0.91,	1.79)	0.52

Table S3 continued

Children with *APOE* genotype available (N = 2254)

	Quartile	Age, sex adjusted Coeff (IQ points)[a]	95% CI	P	Quartile	All adjusted[b] Coeff (IQ points)[a]	95% CI	P
Total cholesterol	1	-	-	-	1	-	-	-
	2	-1.58	(-3.42, 0.25)	0.09	2	-1.11	(-2.82, 0.59)	0.20
	3	-0.80	(-2.64, 1.04)	0.39	3	-0.38	(-2.09, 1.32)	0.66
	4	-1.79	(-3.66, 0.07)	0.06	4	-1.55	(-3.28, 0.18)	0.08
LDL	1	-	-	-	1	-	-	-
	2	-3.54	(-5.38, -1.71)	<0.001	2	-2.86	(-4.57, -1.16)	0.001
	3	-1.51	(-3.38, 0.36)	0.11	3	-1.26	(-2.99, 0.48)	0.16
	4	-2.51	(-4.38, -0.65)	0.01	4	-2.23	(-3.96, -0.50)	0.01
HDL	1	-	-	-	1	-	-	-
	2	0.32	(-1.53, 2.17)	0.74	2	-0.06	(-1.77, 1.66)	0.95
	3	-0.51	(-2.37, 1.35)	0.59	3	-0.36	(-2.09, 1.36)	0.68
	4	-0.60	(-2.47, 1.27)	0.53	4	-0.55	(-2.29, 1.19)	0.53
Triglycerides	1	-	-	-	1	-	-	-
	2	1.96	(0.09, 3.84)	0.04	2	0.83	(-0.92, 2.58)	0.35
	3	1.60	(-0.24, 3.45)	0.09	3	0.44	(-1.28, 2.16)	0.61
	4	1.34	(-0.54, 3.22)	0.16	4	0.56	(-1.19, 2.31)	0.53

[a] Coefficients represent change in IQ points for each quartile of lipid compared to the lowest quartile

[b] Age, sex, maternal education, household social class adjusted

Quartiles (all in mmol/l): Total cholesterol: <3.83, 3.84-4.23, 4.24-4.67, >4.67; LDL cholesterol: <1.96, 1.96-2.31, 2.31-2.71, >2.71; HDL cholesterol: <1.19, 1.2-1.38, 1.39-1.60, 1.61-2.88 Triglycerides: <0.77, 0.77-1.01, 1.02-1.38, >1.38

Table S4. Associations of lipids with cognitive function measures

	Age, sex adjusted				Fully adjusted[c]			
	N	Coeff[b]	95% CI	p	N	Coeff[b]	95% CI	p
Key stage 3 English								
Total cholesterol (mmol/l)	3270	-0.76	(1.60, 0.08)	0.07	3270	-0.49	(-1.27, 0.28)	0.21
LDL cholesterol (mmol/l)	3270	-1.05	(-1.97, -0.12)	0.03	3270	-0.72	(-1.58, 0.13)	0.10
HDL cholesterol (mmol/l)	3270	-0.69	(-2.49, 1.11)	0.45	3270	-0.81	(-2.48, 0.86)	0.34
Triglyceride[a] (mmol/l)	3270	1.25	(-0.03, 2.52)	0.06	3270	1.17	(-0.01, 2.35)	0.05
Key stage 3 Maths								
Total cholesterol (mmol/l)	3305	-1.08	(-2.17, 0.01)	0.05	3305	-0.80	(-1.84, 0.24)	0.13
LDL cholesterol (mmol/l)	3305	-1.16	(-2.36, 0.04)	0.06	3305	-0.80	(-1.95, 0.35)	0.17
HDL cholesterol (mmol/l)	3305	-0.34	(-2.69, 2.00)	0.77	3305	-0.53	(-2.77, 1.71)	0.64
Triglyceride[a] (mmol/l)	3305	0.31	(-1.35, 1.97)	0.71	3305	0.26	(-1.33, 1.85)	0.75
Key stage 3 Science								
Total cholesterol (mmol/l)	3322	-0.70	(-1.89, 0.48)	0.25	3322	-0.53	(-1.71, 0.64)	0.38
LDL cholesterol (mmol/l)	3322	-0.54	(-1.85, 0.78)	0.42	3322	-0.31	(-1.61, 0.98)	0.64
HDL cholesterol (mmol/l)	3322	-1.05	(-3.60, 1.49)	0.42	3322	-1.21	(-3.73, 1.32)	0.35
Triglyceride[a] (mmol/l)	3322	0.44	(-1.38, 2.25)	0.64	3322	0.43	(-1.37, 2.22)	0.64
Key stage 2 English								
Total cholesterol (mmol/l)	3772	-0.47	(-1.15, 0.21)	0.18	3772	-0.27	(-0.91, 0.36)	0.40
LDL cholesterol (mmol/l)	3772	-0.68	(-1.44, 0.07)	0.08	3772	-0.41	(-1.11, 0.30)	0.26
HDL cholesterol (mmol/l)	3772	0.55	(-0.92, 2.01)	0.46	3772	0.31	(-1.06, 1.68)	0.65
Triglyceride[a] (mmol/l)	3772	0.07	(-0.97, 1.11)	0.89	3772	-0.02	(-0.99, 0.95)	0.97

Table S4 continued

Key stage 2 Maths

Total cholesterol (mmol/l)	3777	-1.21	(2.14, 0.29)	0.01	3777	-0.93	(-1.80, -0.06)	0.04
LDL cholesterol (mmol/l)	3777	-1.25	(-2.27, -0.22)	0.02	3777	-0.89	(-1.86, 0.07)	0.07
HDL cholesterol (mmol/l)	3777	-0.28	(-2.27, 1.71)	0.78	3777	-0.46	(-2.33, 1.41)	0.63
Triglyceride[a] (mmol/l)	3777	-0.28	(-1.70, 1.14)	0.70	3777	-0.38	(-1.71, 0.96)	0.58

Key stage 2 Science

Total cholesterol (mmol/l)	3790	-0.57	(-1.08, -0.07)	0.03	3790	-0.42	(-0.89, 0.06)	0.08
LDL cholesterol (mmol/l)	3790	-0.57	(-1.13, 0.00)	0.05	3790	-0.36	(-0.88, 0.17)	0.18
HDL cholesterol (mmol/l)	3790	-0.60	(-1.69, 0.49)	0.28	3790	-0.68	(-1.70, 0.34)	0.19
Triglyceride[a] (mmol/l)	3790	0.05	(-0.55, 0.65)	0.87	3790	0.28	(-0.44, 1.01)	0.44

Working memory global score

Total cholesterol (mmol/l)	3582	0.004	(-0.37, 0.38)	0.98	3582	0.07	(-0.30, 0.44)	0.70
LDL cholesterol (mmol/l)	3582	-0.11	(-0.53, 0.31)	0.60	3582	-0.01	(-0.43, 0.40)	0.94
HDL cholesterol (mmol/l)	3582	0.26	(-0.56, 1.08)	0.53	3582	0.21	(-0.59, 1.01)	0.61
Triglyceride[a] (mmol/l)	3582	0.08	(-0.50, 0.66)	0.78	3582	0.04	(-0.53, 0.61)	0.89

Non word repetition

Total cholesterol (mmol/l)	3736	-0.17	(0.29, 0.05)	0.01	3736	-0.14	(-0.26, -0.02)	0.02
LDL cholesterol (mmol/l)	3736	-0.18	(0.32, 0.05)	0.01	3736	-0.14	(-0.27, -0.01)	0.03
HDL cholesterol (mmol/l)	3736	-0.07	(-0.33, 0.19)	0.58	3736	-0.10	(-0.35, 0.16)	0.46
Triglyceride[a] (mmol/l)	3736	-0.05	(-0.23, 0.13)	0.59	3736	-0.06	(-0.24, 0.12)	0.49

[a] Triglyceride is log transformed

[b] Coefficients from linear regression represent increase in IQ points per mmol/l increase in lipid measure

[c] Age, sex, maternal education, household social class adjusted

Table S5. Associations of lipids (in quartiles) with cognitive function measures

		Quartile	N	Coeff [a]	95% CI	P	Quartile	N	Coeff [a]	95% CI	P
			Age, sex adjusted						**All adjusted[b]**			
Key stage 3											
English	Total Cholesterol	1	812	-	-	-	1	812	-	-	-
		2	815	-0.98	(-2.55, 0.58)	0.22	2	815	-0.47	(-1.91, 0.98)	0.53
		3	819	-0.74	(-2.31, 0.82)	0.35	3	819	-0.19	(-1.64, 1.26)	0.8
		4	824	-1.15	(-2.71, 0.42)	0.15	4	824	-0.65	(-2.10, 0.80)	0.38
	LDL	1	781	-	-	-	1	781	-	-	-
		2	818	-1.02	(-2.60, 0.56)	0.21	2	818	-0.53	(-1.99, 0.93)	0.48
		3	852	-0.08	(-1.65, 1.49)	0.92	3	852	0.18	(-1.28, 1.64)	0.81
		4	819	-1.19	(-2.78, 0.40)	0.14	4	819	-0.63	(-2.11, 0.84)	0.4
		1	854	-	-	-	1	854	-	-	-
	HDL	2	826	0.38	(-1.16, 1.92)	0.63	2	826	0.22	(-1.21, 1.64)	0.77
		3	792	-0.95	(-2.51, 0.61)	0.23	3	792	-0.67	(-2.12, 0.77)	0.36
		4	798	-0.53	(-2.09, 1.03)	0.5	4	798	-0.79	(-2.24, 0.65)	0.28
		1	856	-	-	-	1	856	-	-	-
	Triglycerides	2	815	0.38	(-1.16, 1.93)	0.63	2	815	-0.13	(-1.56, 1.30)	0.85
		3	808	2.22	(0.67, 3.77)	0.01	3	808	1.62	(0.18, 3.05)	0.03
		4	791	0.72	(-0.83, 2.28)	0.36	4	791	0.60	(-0.84, 2.04)	0.42
Maths	Total Cholesterol	1	824	-	-	-	1	824	-	-	-
		2	819	0.52	(-1.51, 2.56)	0.61	2	819	1.06	(-0.89, 3.00)	0.29
		3	834	-0.71	(-2.74, 1.32)	0.49	3	834	-0.11	(-2.05, 1.84)	0.91
		4	828	-0.98	(-3.01, 1.06)	0.35	4	828	-0.48	(-2.42, 1.47)	0.63

	LDL	1	792	-	-	-	1	792	-	-	-
		2	827	-1.57	(-3.62, 0.48)	0.13	2	827	-1.01	(-2.97, 0.95)	0.31
		3	860	-0.15	(-2.19, 1.89)	0.88	3	860	0.18	(-1.78, 2.13)	0.86
		4	826	-2.00	(-4.07, 0.06)	0.06	4	826	-1.41	(-3.39, 0.56)	0.16
	HDL	1	869	-	-	-	1	869	-	-	-
		2	833	1.18	(-0.81, 3.18)	0.25	2	833	0.97	(-0.94, 2.88)	0.32
		3	802	0.59	(-1.43, 2.62)	0.57	3	802	0.87	(-1.07, 2.80)	0.38
		4	801	0.31	(-1.72, 2.34)	0.76	4	801	-0.04	(-1.98, 1.90)	0.97
	Triglycerides	1	857	-	-	-	1	857	-	-	-
		2	823	0.98	(-1.04, 2.99)	0.34	2	823	0.58	(-1.35, 2.51)	0.56
		3	825	1.10	(-0.92, 3.12)	0.28	3	825	0.69	(-1.24, 2.62)	0.48
		4	800	-0.04	(-2.07, 1.99)	0.97	4	800	-0.09	(-2.03, 1.85)	0.93
Science	Cholesterol	1	827	-	-	-	1	827	-	-	-
		2	823	-0.14	(-2.36, 2.08)	0.90	2	823	0.09	(-2.11, 2.29)	0.93
		3	839	-0.03	(-2.24, 2.19)	0.98	3	839	0.33	(-1.87, 2.52)	0.77
		4	833	-1.36	(-3.58, 0.86)	0.23	4	833	-1.09	(-3.29, 1.10)	0.33
	LDL	1	792	-	-	-	1	792	-	-	-
		2	835	-1.35	(-3.59, 0.89)	0.24	2	835	-0.99	(-3.21, 1.22)	0.38
		3	865	-1.28	(-3.51, 0.95)	0.26	3	865	-1.07	(-3.29, 1.14)	0.34
		4	830	-1.65	(-3.91, 0.62)	0.15	4	830	-1.29	(-3.52, 0.95)	0.26
	HDL	1	874	-	-	-	1	874	-	-	-
		2	832	0.31	(-1.87, 2.50)	0.78	2	832	0.23	(-1.93, 2.39)	0.84
		3	808	0.29	(-1.92, 2.50)	0.80	3	808	0.46	(-1.73, 2.64)	0.68
		4	808	-1.02	(-3.23, 1.19)	0.36	4	808	-1.26	(-3.45, 0.93)	0.26

	Triglycerides	1	864	-	-	-	1	864	-	-	-
		2	827	-0.41	(-2.61, 1.78)	0.71	2	827	-0.64	(-2.82, 1.53)	0.56
		3	830	2.05	(-0.15, 4.25)	0.07	3	830	1.77	(-0.40, 3.95)	0.11
		4	801	0.18	(-2.03, 2.39)	0.87	4	801	0.18	(-2.01, 2.37)	0.87

Key stage 2

English	Cholesterol	1	966	-	-	-	1	966	-	-	-
		2	925	-0.91	(-2.18, 0.36)	0.16	2	925	-0.35	(-1.54, 0.83)	0.56
		3	945	-0.40	(-1.66, 0.87)	0.54	3	945	0.18	(-1.00, 1.36)	0.76
		4	936	-1.06	(-2.33, 0.21)	0.10	4	936	-0.69	(-1.88, 0.49)	0.25
	LDL	1	918	-	-	-	1	918	-	-	-
		2	949	-0.99	(-2.26, 0.29)	0.13	2	949	-0.57	(-1.77, 0.62)	0.35
		3	969	-0.39	(-1.67, 0.88)	0.55	3	969	-0.08	(-1.27, 1.12)	0.9
		4	936	-0.93	(-2.22, 0.36)	0.16	4	936	-0.53	(-1.73, 0.68)	0.39
	HDL	1	980	-	-	-	1	980	-	-	-
		2	959	1.27	(0.02, 2.52)	0.05	2	959	0.94	(-0.23, 2.11)	0.12
		3	919	-0.04	(-1.31, 1.23)	0.95	3	919	-0.01	(-1.20, 1.18)	0.99
		4	914	0.54	(-0.74, 1.81)	0.41	4	914	0.16	(-1.03, 1.35)	0.79
	Triglycerides	1	980	-	-	-	1	980	-	-	-
		2	944	0.54	(-0.72, 1.80)	0.40	2	944	-0.06	(-1.24, 1.12)	0.92
		3	942	0.99	(-0.27, 2.26)	0.12	3	942	0.39	(-0.79, 1.57)	0.52
		4	906	-0.01	(-1.28, 1.27)	0.99	4	906	-0.14	(-1.32, 1.05)	0.82
Maths	Cholesterol	1	961	-	-	-	1	961	-	-	-
		2	929	-0.76	(-2.49, 0.97)	0.39	2	929	-0.07	(-1.70, 1.55)	0.93
		3	944	-0.71	(-2.43, 1.02)	0.42	3	944	0.02	(-1.60, 1.64)	0.98
		4	943	-2.37	(-4.10, -0.65)	0.01	4	943	-1.84	(-3.46, -0.21)	0.03

		Q	N	Est	CI	p	N	Est	CI	p
	LDL	1	918	-	-	-	918	-	-	-
		2	947	-1.60	(-3.34, 0.14)	0.07	947	-1.05	(-2.69, 0.58)	0.21
		3	969	-1.45	(-3.19, 0.29)	0.10	969	-0.99	(-2.63, 0.65)	0.24
		4	943	-2.24	(-3.99, -0.48)	0.01	943	-1.72	(-3.37, -0.07)	0.04
	HDL	1	980	-	-	-	980	-	-	-
		2	955	0.79	(-0.91, 2.50)	0.36	955	0.42	(-1.18, 2.03)	0.61
		3	920	-0.25	(-1.98, 1.49)	0.78	920	-0.09	(-1.72, 1.53)	0.91
		4	922	0.42	(-1.32, 2.15)	0.64	922	0.04	(-1.59, 1.67)	0.96
	Triglycerides	1	978	-	-	-	978	-	-	-
		2	948	1.16	(-0.55, 2.88)	0.18	948	0.47	(-1.14, 2.09)	0.57
		3	944	0.75	(-0.98, 2.47)	0.40	944	-0.02	(-1.64, 1.60)	0.98
		4	907	-0.28	(-2.02, 1.45)	0.75	907	-0.38	(-2.01, 1.25)	0.65
Science	Cholesterol	1	967	-	-	-	967	-	-	-
		2	933	0.04	(-0.90, 0.99)	0.93	933	0.42	(-0.46, 1.30)	0.35
		3	948	-0.001	(-0.95, 0.94)	1.00	948	0.39	(-0.49, 1.27)	0.38
		4	942	-1.09	(-2.04, -0.14)	0.02	942	-0.79	(-1.67, 0.09)	0.08
	LDL	1	917	-	-	-	917	-	-	-
		2	959	-0.60	(-1.56, 0.35)	0.22	959	-0.28	(-1.17, 0.61)	0.54
		3	972	-0.26	(-1.21, 0.70)	0.60	972	0.04	(-0.85, 0.94)	0.92
		4	942	-1.06	(-2.03, -0.10)	0.03	942	-0.76	(-1.66, 0.14)	0.10
	HDL	1	986	-	-	-	986	-	-	-
		2	960	0.27	(-0.67, 1.20)	0.58	960	0.08	(-0.79, 0.95)	0.85
		3	920	-0.49	(-1.44, 0.46)	0.31	920	-0.43	(-1.32, 0.45)	0.34
		4	924	-0.04	(-0.99, 0.91)	0.93	924	-0.23	(-1.11, 0.66)	0.62

Triglycerides	1	980	-	-	-	1	980	-	-	-
	2	954	1.20	(0.26, 2.14)	0.01	2	954	0.78	(-0.10, 1.65)	0.08
	3	946	0.81	(-0.13, 1.75)	0.09	3	946	0.35	(-0.53, 1.23)	0.43
	4	910	0.46	(-0.49, 1.41)	0.34	4	910	0.35	(-0.54, 1.23)	0.44
Working memory										
Cholesterol	1	933	-	-	-	1	933	-	-	-
	2	879	0.01	(-0.70, 0.71)	0.99	2	879	0.16	(-0.53, 0.85)	0.65
	3	901	0.05	(-0.65, 0.75)	0.89	3	901	0.23	(-0.46, 0.92)	0.52
	4	869	-0.12	(-0.83, 0.59)	0.74	4	869	0.01	(-0.68, 0.71)	0.97
LDL	1	890	-	-	-	1	890	-	-	-
	2	909	-0.07	(-0.78, 0.64)	0.85	2	909	0.07	(-0.62, 0.77)	0.83
	3	912	-0.29	(-1.00, 0.42)	0.42	3	912	-0.15	(-0.85, 0.55)	0.67
	4	871	-0.07	(-0.79, 0.65)	0.85	4	871	0.09	(-0.61, 0.80)	0.8
HDL	1	928	-	-	-	1	928	-	-	-
	2	912	0.24	(-0.46, 0.94)	0.49	2	912	0.15	(-0.54, 0.83)	0.68
	3	891	0.28	(-0.43, 0.98)	0.44	3	891	0.24	(-0.45, 0.93)	0.5
	4	851	0.40	(-0.31, 1.12)	0.27	4	851	0.32	(-0.38, 1.02)	0.37
Triglycerides	1	915	-	-	-	1	915	-	-	-
	2	911	-0.13	(-0.83, 0.57)	0.72	2	911	-0.29	(-0.98, 0.40)	0.41
	3	901	-0.19	(-0.89, 0.52)	0.6	3	901	-0.34	(-1.04, 0.35)	0.33
	4	855	0.03	(-0.69, 0.74)	0.94	4	855	-0.02	(-0.72, 0.68)	0.95
Non word repetition										
Cholesterol	1	961	-	-	-	1	961	-	-	-
	2	907	-0.05	(-0.27, 0.18)	0.68	2	907	0	(-0.22, 0.21)	0.97
	3	947	-0.10	(-0.32, 0.12)	0.38	3	947	-0.04	(-0.26, 0.18)	0.71
	4	921	-0.29	(-0.52, -0.06)	0.01	4	921	-0.24	(-0.46, -0.02)	0.03

LDL	1	923	-	-	-	1	923	-	-	-
	2	939	-0.08	(-0.31, 0.14)	0.46	2	939	-0.02	(-0.24, 0.20)	0.83
	3	946	-0.13	(-0.35, 0.10)	0.28	3	946	-0.08	(-0.30, 0.14)	0.49
	4	928	-0.31	(-0.54, -0.08)	0.01	4	928	-0.24	(-0.46, -0.02)	0.04
HDL	1	947	-	-	-	1	947	-	-	-
	2	965	0.03	(-0.19, 0.25)	0.78	2	965	-0.01	(-0.23, 0.21)	0.92
	3	911	-0.02	(-0.24, 0.21)	0.9	3	911	-0.04	(-0.26, 0.18)	0.7
	4	913	0.001	(-0.23, 0.23)	0.99	4	913	-0.03	(-0.25, 0.19)	0.77
Triglycerides	1	942	-	-	-	1	942	-	-	-
	2	943	0.04	(-0.19, 0.26)	0.75	2	943	-0.01	(-0.23, 0.21)	0.91
	3	938	0.03	(-0.19, 0.26)	0.78	3	938	-0.02	(-0.24, 0.20)	0.88
	4	913	-0.12	(-0.34, 0.11)	0.31	4	913	-0.13	(-0.35, 0.09)	0.25

[a] Coefficients represent change in each cognitive function score for each quartile of lipid compared to the lowest quartile

[b] Age, sex, maternal education, household social class adjusted

Table S6. Attainment at key stage 1 by *APOE* genotype

	ε2/ε2		ε3/ε2		ε4/ε2		ε3/ε3		ε3/ε4		ε4/ε4		Total		Pᵃ
	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	N	(%)	Pᵃ
Reading															
Below average	6	(14.6)	93	(13.7)	12	(9.4)	391	(13.6)	156	(13.6)	16	(15.2)	674	(13.6)	
Average	23	(56.1)	357	(52.4)	70	(54.7)	1450	(50.5)	602	(52.5)	48	(45.7)	2550	(51.3)	
Above average	12	(29.27)	231	(33.9)	46	(35.9)	1029	(35.9)	389	(33.9)	41	(39.1)	1748	(35.2)	p = 0.82
Writing															
Below average	5	(12.2)	102	(15.0)	13	(10.2)	387	(13.5)	152	(13.2)	18	(17.1)	677	(13.6)	
Average	33	(80.5)	527	(77.5)	102	(79.7)	2236	(78.0)	902	(78.5)	74	(70.5)	3874	(78.0)	
Above average	3	(7.32)	51	(7.50)	13	(10.2)	244	(8.51)	95	(8.3)	13	(12.4)	419	(8.4)	p = 0.69
Maths															
Below average	3	(7.32)	70	(10.3)	5	(3.9)	255	(8.9)	97	(8.5)	11	(10.5)	441	(8.9)	
Average	34	(82.9)	433	(63.8)	84	(65.6)	1860	(64.9)	737	(64.2)	69	(65.7)	3217	(64.8)	
Above average	4	(9.76)	176	(25.9)	39	(30.5)	751	(26.2)	314	(27.4)	25	(23.8)	1309	(26.4)	p = 0.18

[a] p value from chi square test

Taylor *et al.*

Table S7. Associations of *APOE* genotype with IQ, stratified by sex

		Males				Females		
		Coeff[a]	**95% CI**	**P[b]**		**Coeff[a]**	**95% CI**	**P[b]**
Total IQ	N = 2121				N = 1804			
	ε2/ε2	2.67	(-5.31, 10.65)		ε2/ε2	5.02	(-3.45, 13.50)	
	ε2/ε3	0.49	(-1.59, 2.56)		ε2/ε3	0.16	(-2.12, 2.44)	
	ε2/ε4	2.70	(-1.70, 7.09)		ε2/ε4	-1.32	(-5.95, 3.31)	
	ε3/ε3	-	-		ε3/ε3	-	-	
	ε3/ε4	1.62	(-0.12, 3.35)		ε3/ε4	-1.63	(-3.35, 0.10)	
	ε4/ε4	-0.18	(-4.95, 4.58)	0.45	ε4/ε4	6.37	(1.29, 11.45)	0.03
Verbal IQ	N = 2127				N = 1811			
	ε2/ε2	2.52	(-5.71, 10.74)		ε2/ε2	5.75	(-2.68, 14.17)	
	ε2/ε3	-0.30	(-2.43, 1.84)		ε2/ε3	0.32	(-1.94, 2.57)	
	ε2/ε4	1.84	(-2.69, 6.36)		ε2/ε4	-1.53	(-6.13, 3.07)	
	ε3/ε3	-	-		ε3/ε3	-	-	
	ε3/ε4	0.55	(-1.23, 2.33)		ε3/ε4	-1.45	(-3.17, 0.26)	
	ε4/ε4	-1.14	(-6.05, 3.76)	0.88	ε4/ε4	6.73	(1.68, 11.78)	0.02
Performance IQ	N = 2132				N = 1808			
	ε2/ε2	2.95	(-5.33, 11.23)		ε2/ε2	2.74	(-6.17, 11.65)	
	ε2/ε3	1.67	(-0.48, 3.82)		ε2/ε3	-0.18	(-2.57, 2.21)	
	ε2/ε4	2.93	(-1.63, 7.49)		ε2/ε4	-0.66	(-5.53, 4.20)	
	ε3/ε3	-	-		ε3/ε3	-	-	
	ε3/ε4	2.72	(0.93, 4.52)		ε3/ε4	-1.16	(-2.97, 0.66)	
	ε4/ε4	0.97	(-3.97, 5.91)	0.06	ε4/ε4	4.43	(-0.91, 9.78)	0.39

[a] Coefficient from linear regression, adjusted for age at IQ testing with ε3/ε3 genotype as reference group

[b] P values for heterogeneity from analysis of covariance model

Table S8. Associations of *APOE* genotype with SATS scores, stratified by sex

	Males				Females		
	Coeff[a]	95% CI	P[b]		Coeff[a]	95% CI	P[b]
Key Stage 2							
English							
N = 2739				**N = 2506**			
ε2/ε2	3.96	(-2.15, 10.06)		ε2/ε2	2.40	(-4.20, 8.99)	
ε2/ε3	-0.34	(-2.08, 1.40)		ε2/ε3	-1.19	(-3.03, 0.65)	
ε2/ε4	1.16	(-2.38, 4.70)		ε2/ε4	-2.25	(-6.08, 1.58)	
ε3/ε3	-	-		ε3/ε3	-	-	
ε3/ε4	0.93	(-0.53, 2.39)		ε3/ε4	-2.31	(-3.73, -0.88)	
ε4/ε4	-2.19	(-6.25, 1.87)	0.39	ε4/ε4	1.54	(-2.41, 5.50)	0.02
Maths							
N = 2762				**N = 2501**			
ε2/ε2	4.34	(-3.78, 12.45)		ε2/ε2	3.03	(-6.17, 12.23)	
ε2/ε3	-0.98	(-3.28, 1.31)		ε2/ε3	-0.02	(-2.52, 2.49)	
ε2/ε4	-0.19	(-4.93, 4.54)		ε2/ε4	-2.10	(-7.30, 3.11)	
ε3/ε3	-	-		ε3/ε3	-	-	
ε3/ε4	0.47	(-1.47, 2.40)		ε3/ε4	-2.10	(-4.04, -0.16)	
ε4/ε4	-6.13	(-11.53, -0.73)	0.20	ε4/ε4	2.41	(-3.02, 7.83)	0.23
Science							
N = 2796				**N = 2514**			
ε2/ε2	3.06	(-1.61, 7.72)		ε2/ε2	3.67	(-1.76, 9.10)	
ε2/ε3	-0.85	(-2.14, 0.43)		ε2/ε3	0.08	(-1.40, 1.56)	
ε2/ε4	0.69	(-1.96, 3.34)		ε2/ε4	-0.77	(-3.84, 2.30)	
ε3/ε3	-	-		ε3/ε3	-	-	
ε3/ε4	0.39	(-0.69, 1.48)		ε3/ε4	-1.49	(-2.64, -0.35)	
ε4/ε4	-1.45	(-4.49, 1.59)	0.34	ε4/ε4	2.47	(-0.70, 5.64)	0.03
Key Stage 3							
English							
N = 2337				**N = 2150**			
ε2/ε2	3.78	(-3.44, 10.99)		ε2/ε2	2.75	(-4.68, 10.18)	
ε2/ε3	-0.20	(-2.26, 1.86)		ε2/ε3	1.46	(-0.71, 3.63)	
ε2/ε4	0.43	(-3.84, 4.70)		ε2/ε4	1.17	(-3.31, 5.64)	
ε3/ε3	-	-		ε3/ε3	-	-	
ε3/ε4	1.01	(-0.75, 2.78)		ε3/ε4	-0.93	(-2.63, 0.76)	
ε4/ε4	-2.27	(-6.95, 2.41)	0.61	ε4/ε4	3.41	(-1.36, 8.19)	0.26
Maths							
N = 2419				**N = 2188**			
ε2/ε2	1.52	(-7.38, 10.41)		ε2/ε2	1.11	(-8.30, 10.52)	
ε2/ε3	-1.39	(-3.89, 1.12)		ε2/ε3	-1.32	(-4.11, 1.48)	

ε2/ε4	1.21	(-3.97, 6.40)		ε2/ε4	-3.88	(-9.64, 1.87)	
ε3/ε3	-	-		*ε3/ε3*	-	-	
ε3/ε4	0.99	(-1.16, 3.14)		*ε3/ε4*	-0.60	(-2.79, 1.58)	
ε4/ε4	-4.62	(-10.24, 1.01)	0.34	*ε4/ε4*	5.19	(-0.83, 11.22)	0.31

Science

N = 2439   **N = 2196**

Genotype	Coef	CI	P	Genotype	Coef	CI	P
ε2/ε2	-1.99	(-11.74, 7.75)		ε2/ε2	-3.79	(-14.46, 6.88)	
ε2/ε3	2.31	(-0.43, 5.05)		ε2/ε3	-0.72	(-3.88, 2.44)	
ε2/ε4	1.57	(-4.07, 7.20)		ε2/ε4	0.01	(-6.46, 6.49)	
ε3/ε3	-	-		ε3/ε3	-	-	
ε3/ε4	1.36	(-0.99, 3.70)		ε3/ε4	1.26	(-1.21, 3.73)	
ε4/ε4	1.11	(-5.05, 7.27)	0.59	ε4/ε4	5.07	(-1.82, 11.97)	0.55

[a] Coefficient from linear regression, adjusted for age child's age in months with ε3/ε3 genotype as reference group

[b] P values for heterogeneity from analysis of covariance model