

Supplemental file S1 Growth mixture modelling (GMM) used to specify bedroom screen access and overall screen exposure trajectories

This file provides information on growth mixture modelling (GMM) used to specify bedroom screen access and overall screen exposure trajectories in the analysis sample (n=2 810).

GMM followed a procedure similar to that described in Methods in relation to trajectories of overweight and obesity.

Bedroom screen access trajectories

Access was modelled as a binary categorical outcome (yes/no). Table A provides model fit information, and Table B provides information on the probability of bedroom screen access at each of four time points, for the trajectories identified in the selected 3-class model.

Table A Growth mixture models of bedroom electronic screen exposure from 46 to 122 months: model fit

Number of classes	LL	AIC	BIC	Entropy	LMR <i>p</i> -value	Smallest class (%)
1	-6972.63	13949.26	13961.14			
2	-5518.89	11047.79	11077.49	0.84	0.000	45.5
3	-5295.15	10606.3	10653.82	0.80	0.000	26.7
4	-5291.89	10605.78	10671.13	0.70	0.275	18.1
5	-5291.77	10611.53	10694.71	0.57	0.000	16.4

Notes: LL=Log likelihood, AIC=Akaike Information Criterion, BIC=Bayesian Information Criterion, LMR=Lo-Mendell-Rubin likelihood ratio test. Figures in bold show the fit of the 3-class model selected.

Table B Probability of bedroom screen access at 46, 58, 94 and 122 months in a 3-class trajectory model.

Bedroom screen access trajectory			
Child age	Late increase (36%)	Early increase (27%)	High (37%)
46 months	0.02	0.07	0.94
58 months	0.04	0.25	0.95
94 months	0.17	0.97	0.96
122 months	0.44	1.00	0.97

Overall Screen exposure trajectories

Exposure was modelled as a tripartite categorical outcome (<2hours, 2-<4 hours, 4+ hours per day). Table C provides model fit information, and Table D provides information on screen use at each of five time points, for the trajectories identified in the selected 3-class model.

Table C Growth mixture models of overall screen exposure from 46 to 122 months: model fit

Number of classes	LL	AIC	BIC	Entropy	LMR <i>p</i> -value	Smallest class (%)
1.00	-13479.38	26964.76	26982.58			
2.00	-12544.51	25101.02	25136.67	0.65	0.000	47.50
3.00	-12367.91	24753.83	24807.30	0.64	0.000	19.30
4.00	-12356.26	24736.52	24807.81	0.54	0.152	11.60
5.00	-12220.77	24471.54	24560.65	0.59	1.000	0.70

Notes: LL=Log likelihood, AIC=Akaike Information Criterion, BIC=Bayesian Information Criterion, LMR=Lo-Mendell-Rubin likelihood ratio test. Figures in bold show the fit of the 3-class model selected.

Table D Estimated probabilities of average daily screen exposure at 46, 58, 70, 94 and 122 months in a 3-class trajectory model.

		Overall screen time trajectory		
Child age	Average daily screen time	Low	Moderate	High
46 months	<2 hrs	0.85	0.44	0.08
	2 to <4 hours	0.14	0.52	0.64
	4+ hours	0.01	0.04	0.29
58 months	<2 hrs	0.82	0.36	0.06
	2 to <4 hours	0.17	0.59	0.59
	4+ hours	0.01	0.06	0.35
70 months	<2 hrs	0.78	0.28	0.04
	2 to <4 hours	0.21	0.64	0.54
	4+ hours	0.01	0.08	0.42
94 months	<2 hrs	0.67	0.17	0.03
	2 to <4 hours	0.31	0.69	0.42
	4+ hours	0.02	0.14	0.56
122 months	<2 hrs	0.53	0.08	0.01
	2 to <4 hours	0.44	0.64	0.27
	4+ hours	0.03	0.28	0.71

Supplemental File S2 – Growth Mixture Models of overweight and obesity

Table A provides indices of model fit. For both sexes, a 5-class model was selected, even though AIC and BIC values were slightly lower in a 6-class model. For boys, the LMR test for the 6-class model indicated no significant improvement in fit over a 5-class model and smallest class was prohibitively low. For girls, even though the LMR test indicated an improved fit for the 6-class model the smallest class size was again too low, especially given the reduced sample available for analysis of trajectory correlates.

Table A Growth mixture models of overweight and obesity trajectories from 46 to 122 months: model fit

Boys, n=2 085

Number of classes	LL	AIC	BIC	Entropy	LMR <i>p</i> -value	Smallest class (%)
1	-3901.41	7808.82	7825.75			
2	-3224.37	6460.74	6494.59	0.83	0	19.1
3	-3096.78	6211.56	6262.35	0.82	0	4.6
4	-3040.03	6104.05	6171.76	0.79	0	3.8
5	-3026.84	6083.68	6168.32	0.77	0.047	3.6
6	-3008.17	6052.34	6153.9	0.8	0.1	0.9
7	-3004.22	6050.43	6168.93	0.72	0.588	0.9

Girls, n=1 991

Number of classes	LL	AIC	BIC	Entropy	LMR <i>p</i> -value	Smallest class (%)
1	-4800.54	9607.08	9623.87			
2	-3860.91	7733.81	7767.39	0.83	0	28
3	-3643.06	7304.12	7354.49	0.82	0	7.8
4	-3588.35	7200.69	7267.85	0.81	0	8.2
5	-3556.99	7143.97	7227.92	0.8	0.037	4.6
6	-3529.06	7094.12	7194.86	0.82	0.002	2.3
7	-3527.1	7096.21	7213.73	0.83	0.314	0.4

Notes: LL=Log likelihood, AIC=Akaike Information Criterion, BIC=Bayesian Information Criterion, LMR=Lo-Mendell-Rubin likelihood ratio test. Figures in bold show the fit of the 5-class model selected for boys and girls

Supplemental File S3 Associations between covariates and primary exposures

Figure show column percentages or means (as indicated), with *p* value for test of difference across all exposure groups/

(1) Bedroom screen access trajectory

Covariate		Bedroom screen trajectory			<i>P</i>	
		Late increase	Early increase	High stable		
Male sex	%	50.9	50.4	53.1	0.455	
Mother's BMI	Mean	25.9	26.9	28.0	<.001	
First born	%	58.6	52.7	43.5	<.001	
Teenage mother	%	3.2	10.4	29.1	<.001	
Mother ethnic minority	%	7.0	2.5	1.4	<.001	
Mother's education	None	%	1.6	5.1	13.4	<.001
	Standard grades-lower	%	2.0	5.2	8.1	
	Standard grades-upper	%	11.3	19.5	30.0	
	Highers	%	27.2	36.0	35.5	
	Degree	%	57.9	34.2	13.0	
Mother's mental health	Mean	0.1	0.0	-0.3	<.001	
Smoked in pregnancy	%	8.6	20.1	36.4	<.001	
Poverty score	Mean	0.7	1.7	4.0	<.001	
Lone parent score	Mean	0.2	0.4	0.9		
Large family	%	14.5	12.9	24.1	<.001	
Breastfeeding duration	Months	Mean	4.9	2.8	1.4	<.001
First solids	Age in months	Mean	4.7	4.6	4.4	<.001
Picky diet	Mean	0.0	0.0	0.0	0.225	
Diet quality	Mean	0.3	-0.1	-0.3	<.001	
Household organisation	Mean	1.7	1.6	1.5	<.001	
Irregular bedtimes	Mean	-0.1	0.0	0.2	<.001	
Skips breakfast	%	2.1	2.9	8.2	<.001	
Sleep	Mean	10.8	10.7	10.4	<.001	
Physical activity	Mean	1.3	1.3	1.3	0.074	
Screen time trajectory	Low	%	37.8	23.0	13.6	<.001
	Medium	%	54.8	61.0	59.2	
	High	%	7.4	16.0	27.2	

(2) Mealtime setting

			Mealtime setting			<i>P</i>
		%	Informal	Intermediate	Formal	
Male sex		Mean	52.8	48.8	53.0	0.226
Mother's BMI		%	28.3	26.5	26.0	<.001
Firstborn		%	50.7	53.1	48.4	0.227
Teenage mother		%	25.4	8.6	10.1	<.001
Mother ethnic minority		%	4.1	2.1	3.3	0.170
Mother's education	None	%	11.9	4.1	3.2	<.001
	Standard					
	grades-lower	%	8.5	3.1	3.6	
	Standard					
	grades-upper	%	28.2	19.1	15.3	
	Highers	%	34.3	36.5	30.8	
	Degree	Mean	17.1	37.2	47.3	
Mother's mental health		%	-0.3	0.1	0.1	<.001
Smoked in pregnancy		Mean	36.0	18.2	11.6	<.001
Poverty score		Mean	4.1	1.4	1.1	<.001
Lone parent score		%	0.9	0.3	0.2	<.001
Large family		Mean	19.1	14.0	18.9	0.029
Breastfeeding duration	Months	Mean	1.7	3.2	4.0	<.001
First solids	Age in months	Mean	4.4	4.6	4.6	0.159
Picky eater		Mean	0.0	0.0	-0.1	0.034
Diet quality		Mean	-0.3	0.0	0.1	<.001
Household organisation		Mean	1.5	1.7	1.7	<.001
Irregular bedtimes		Mean	0.2	-0.1	-0.2	<.001
Skips breakfast		%	7.1	3.2	1.4	<.001
Sleep		Mean	10.4	10.7	10.8	<.001
Physical activity		Mean	1.3	1.4	1.3	0.032
Screen time trajectory	Low	%	61.3	60.4	52.3	<.001
	Medium	%	12.3	26.1	36.9	
	High		26.5	13.5	10.8	

(3) Mealtime interaction

			Mealtime Interaction			
			Negative	Intermediate	Positive	<i>p</i>
Male sex		%	53.8	50.1	50.7	0.293
Mother's BMI		mean	27.2	27.2	26.8	0.367
Firstborn		%	48.8	51.7	52.0	0.380
Teenage mother		%	22.1	13.2	11.3	<.001
Mother ethnic minority		%	3.4	2.9	3.4	0.863
Mother's education	none	%	10.8	4.5	5.1	<.001
	standard grades-lower	%	5.4	4.0	6.8	
	standard grades-upper	%	26.4	20.5	17.2	
	Highers	%	30.7	35.3	36.3	
	Degree	%	26.7	35.6	34.6	
Mother's mental health		mean	-0.3	0.0	0.1	<.001
Smoked in pregnancy		%	30.0	20.1	19.3	<.001
Poverty score		mean	3.2	1.8	2.0	<.001
lone parent score		mean	0.7	0.4	0.5	<.001
large family breastfeeding duration	months	mean	2.3	3.0	3.1	<.001
First solids	age in months	mean	4.4	4.5	4.6	0.105
Picky eater		mean	0.2	0.0	-0.2	<.001
Diet quality		mean	-0.2	0.0	0.1	<.001
Household organisation		mean	1.4	1.7	1.8	<.001
Irregular bedtimes		mean	0.2	0.0	-0.1	<.001
Skips breakfast		%	5.7	3.9	3.0	0.029
Sleep		mean	10.5	10.7	10.7	<.001
Physical activity		mean	1.3	1.3	1.4	0.189
Screen time trajectory	low	%	17.8	24.6	29.4	<.001
	medium	%	58.0	61.6	55.8	
	high	%	24.3	13.8	14.8	

Supplemental File S4 Final mutually adjusted model with all covariates

Primary exposures (comparison group)		Trajectory class (reference=Low Risk)							
		High/Increasing Obesity		High/Stable Overweight		Increasing Overweight		Decreasing Overweight	
		RRR (95% CI)	<i>p</i>	RRR (95% CI)	<i>p</i>	RRR (95% CI)	<i>p</i>	RRR (95% CI)	<i>p</i>
Bedroom screen trajectory (late increase)	early increase	2.55 (1.30, 5.00)	0.007	1.62 (1.01, 2.57)	0.044	1.21 (0.85, 1.72)	0.285	0.76 (0.50, 1.16)	0.198
	high stable	1.77 (0.86, 3.62)	0.118	1.11 (0.72, 1.72)	0.623	1.05 (0.75, 1.46)	0.788	0.75 (0.47, 1.20)	0.225
Mealtime setting (formal)	intermediate	1.89 (1.09, 3.28)	0.023	0.94 (0.65, 1.36)	0.748	1.50 (1.03, 2.19)	0.036	0.78 (0.58, 1.05)	0.104
	informal	3.67 (1.99, 6.77)	0.000	0.94 (0.54, 1.62)	0.811	1.75 (1.17, 2.62)	0.007	1.23 (0.86, 1.75)	0.243
Mealtime interaction (negative)	intermediate	1.09 (0.61, 1.95)	0.772	0.84 (0.54, 1.31)	0.444	1.57 (1.09, 2.24)	0.015	0.95 (0.65, 1.37)	0.760
	positive	1.33 (0.73, 2.45)	0.346	1.14 (0.71, 1.82)	0.586	1.64 (1.13, 2.36)	0.010	1.07 (0.70, 1.64)	0.757
Covariates									
Sex (female)	male	0.69 (0.42, 1.11)	0.123	0.51 (0.34, 0.78)	0.002	0.61 (0.46, 0.80)	0.001	0.82 (0.64, 1.07)	0.143
Firstborn (no)	yes	1.14 (0.70, 1.86)	0.598	1.48 (0.86, 2.54)	0.150	0.72 (0.55, 0.95)	0.021	1.33 (0.92, 1.91)	0.129
Teenage mother (no)	yes	1.07 (0.50, 2.29)	0.850	1.14 (0.59, 2.21)	0.701	0.98 (0.61, 1.57)	0.944	1.05 (0.55, 2.01)	0.886
Mother's ethnicity (white)	minority	2.25 (0.82, 6.13)	0.112	0.73 (0.21, 2.49)	0.608	0.50 (0.19, 1.37)	0.175	0.24 (0.03, 1.69)	0.148
Mother's education (none)	standard grades - lower	0.59 (0.19, 1.84)	0.357	0.73 (0.20, 2.64)	0.620	0.67 (0.28, 1.62)	0.364	0.75 (0.26, 2.15)	0.592
	standard grades - upper	0.59 (0.21, 1.63)	0.300	0.88 (0.31, 2.46)	0.799	0.69 (0.39, 1.21)	0.187	0.68 (0.31, 1.48)	0.329
	Highers	0.85 (0.28, 2.55)	0.769	1.29 (0.47, 3.49)	0.617	0.63 (0.34, 1.15)	0.127	0.74 (0.30, 1.81)	0.507
	Degree	0.66 (0.21, 2.04)	0.464	1.02 (0.37, 2.83)	0.972	0.59 (0.30, 1.14)	0.114	0.67 (0.27, 1.70)	0.397
Mother's mental health		0.95 (0.75, 1.21)	0.688	0.97 (0.77, 1.22)	0.777	1.20 (0.97, 1.48)	0.084	1.07 (0.87, 1.31)	0.512
Smoked when pregnant (no)	yes	1.40 (0.75, 2.63)	0.288	1.76 (1.14, 2.72)	0.012	1.02 (0.70, 1.50)	0.903	1.05 (0.62, 1.77)	0.854
Poverty score		0.99 (0.91, 1.09)	0.911	0.98 (0.89, 1.08)	0.691	1.01 (0.93, 1.08)	0.872	0.94 (0.88, 1.01)	0.080
Lone parent score		0.93 (0.74, 1.18)	0.549	0.96 (0.73, 1.27)	0.778	1.04 (0.87, 1.24)	0.660	0.92 (0.76, 1.13)	0.433
Large family (no)	yes	0.53 (0.24, 1.18)	0.121	1.80 (1.00, 3.25)	0.051	0.77 (0.52, 1.15)	0.203	1.16 (0.76, 1.76)	0.498
Breastfeeding duration (months)		0.99 (0.92, 1.07)	0.876	1.01 (0.95, 1.07)	0.773	0.96 (0.93, 1.00)	0.029	1.00 (0.96, 1.04)	0.986
First solids (child age in months_		0.88 (0.72, 1.09)	0.238	0.97 (0.81, 1.17)	0.734	0.99 (0.89, 1.11)	0.917	0.80 (0.70, 0.92)	0.003
Child diet quality		0.83 (0.51, 1.37)	0.458	1.29 (0.85, 1.96)	0.228	1.07 (0.76, 1.50)	0.699	1.21 (0.81, 1.79)	0.346
Child picky diet		0.60 (0.44, 0.81)	0.001	0.80 (0.63, 1.03)	0.080	0.90 (0.80, 1.02)	0.104	1.05 (0.88, 1.25)	0.603
Mother's BMI		1.11 (1.07, 1.16)	0.000	1.06 (1.02, 1.10)	0.003	1.06 (1.04, 1.09)	0.000	1.03 (1.00, 1.07)	0.046
Household organisation		0.91 (0.61, 1.35)	0.635	1.18 (0.87, 1.59)	0.283	1.11 (0.90, 1.37)	0.309	1.45 (1.06, 1.97)	0.019
Irregular bedtime		1.12 (0.89, 1.41)	0.329	1.01 (0.80, 1.29)	0.915	0.94 (0.79, 1.13)	0.522	0.90 (0.77, 1.06)	0.218
Child skips breakfast		0.46 (0.18, 1.15)	0.094	0.75 (0.37, 1.51)	0.415	0.84 (0.44, 1.61)	0.589	1.06 (0.49, 2.29)	0.873
Child screen time trajectory (low)	medium	1.10 (0.55, 2.17)	0.789	1.49 (0.97, 2.28)	0.068	1.58 (1.12, 2.25)	0.011	1.24 (0.89, 1.74)	0.198
	high	0.73 (0.32, 1.65)	0.441	1.91 (0.99, 3.71)	0.054	2.11 (1.26, 3.54)	0.005	1.38 (0.85, 2.24)	0.192
Child sleep (hours/day)		0.94 (0.74, 1.20)	0.625	0.89 (0.71, 1.13)	0.338	0.85 (0.73, 0.98)	0.031	0.86 (0.70, 1.05)	0.131
Child physical activity (hours/day)		1.08 (0.84, 1.37)	0.549	1.01 (0.73, 1.41)	0.944	1.25 (1.06, 1.48)	0.009	1.06 (0.88, 1.27)	0.545

Note: RRR=relative risk ratio