Family/home environment index

The index is intended to measure aspects of the child's postnatal home environment that are likely to influence cognitive development at age five and are not captured by parental educational level/SES.

The variables included in the index may be considered as proxys, since specific measures of the variable were not included in the data. Thus, we selected single variables that might reflect overall family stability and organizational level of daily routines, and factors that might entail suboptimal amount and quality of caretaking and parent-child interaction.

The tables below show the distribution of each variable in relation to offspring and maternal full scale IQ – and the unadjusted and maternal IQ adjusted regression coefficient. A more detailed analysis incorporating other potential confounders might of course show different association between each variable and offspring intelligence.

Distribution of full scale IQ (FSIQ) over categories and association with FSIQ, unadjusted and adjusted for maternal IQ

Biological parents living with child

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 Both	1561	88.7	105.7	12.7	100.3	14.9
1 One	198	11.3	104.3	13.7	97.7	14.9

Association with FSIQ	*Coef*	*P*
Unadjusted	-1.45	0.133
Adjusted	-.70	0.443

Changes in household composition (parents)

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 No	1481	86.7	106.0	12.8	100.9	14.9
1 Yes	227	13.3	103.6	12.7	96.9	15.2

Association with FSIQ	*Coef*	*P*
Unadjusted	-2.35	0.010
Adjusted	-1.12	0.194

We tend to think that we should include only the registration of changes in household composition in the home environment index.

Caretaking outside home >8 hours/day before the child turned 3

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 <=8hrs	1487	88.1	105.6	12.8	99.8	15.1
1 =>8 hrs	201	11.9	106.7	12.3	101.7	15.1

Association with FSIQ	Coef	P
Unadjusted	1.15	0.232
Adjusted	.75	0.408

After 3 years of age

0 <=8hrs	1543	88.1	105.4	12.7	99.9	15.0
1 =>8 hrs	209	11.9	106.9	12.8	100.8	14.7

Association with FSIQ	*Coef*	*P*
Unadjusted	1.47	0.118
Adjusted	1.34	0.129

It should be observed that if a mother works full time 7½ hours per day, it is not unlikely that the child will spend 8 hours or more (say 8½ hours) in a daycare institution. The fact that > 8 hours outside the home is associated with slightly higher offspring IQ may reflect the fact that better educated mothers may be more likely to work full time and to be working a longer distance from home and the daycare institution.

We think that both these variables should be dropped from the home environment index.

Child has been away from the parents for periods lasting >14 days

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 No	1748	99.1	105.6	12.8	100.0	14.9
1 Yes	15	0.9	105.9	14.1	94.3	22.0

Association with FSIQ	*Coef*	*P*
Unadjusted	.37	0.910
Adjusted	2.04	0.514

Only 15 of the children have had this experience and consequently it will not make much of a difference whether we keep this variable in the home environment index. Offspring IQ suggests that it may be dropped from the index, but we might one to keep for other reasons. It seems a natural variable in a home environment index although the child may have been away for reasons that have nothing to do with the quality of the home environment (e. g. in hospital).

Child is always served breakfast

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 Yes	1690	95.7	105.9	12.7	100.2	14.9
1 No	76	4.3	98.8	13.7	95.0	15.2

Association with FSIQ	*Coef*	*P*
Unadjusted	-7.05	0.000
Adjusted	-5.59	0.000

This variable may be a good indicator of the quality of the home environment, especially regarding the degree of organization and structure of the daily routines – at least it makes quite a difference with respect to offspring IQ. It should be kept in the home environment index.

Mother has seen a doctor due to symptoms of depression

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 No	1434	81.0	105.6	13.0	100.2	15.0
1 Yes	337	19.0	105.4	12.3	99.3	15.1

Association with FSIQ	*Coef*	*P*
Unadjusted	-.18	0.813
Adjusted	.14	0.846

A severe and long depression may perhaps have long-term effects on the cognitive development of the child, but we don't have sufficiently detailed information, and consequently the results with respect to offspring IQ are not surprising. It should perhaps be kept in the index because people expect such information in a home environment index.

High alcohol consumption, mothers (>14 drinks/week)

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 No	1715	96.8	105.6	12.8	99.9	15.0
1 Yes	57	3.2	103.1	14.4	102.6	16.2

Association with FSIQ	*Coef*	*P*
Unadjusted	-2.54	0.141
Adjusted	-3.32	0.041

High alcohol consumption, fathers (>21 drinks/week)

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0 No	1687	95.2	105.6	13.0	99.8	15.0
1 Yes	85	4.8	104.8	10.6	103.8	15.3

Association with FSIQ	*Coef*	*P*
Unadjusted	-.80	0.573
Adjusted	-1.95	0.148

Maternal alcohol consumption above official Danish recommendations seems to be quite strongly associated with offspring IQ. The question is whether we should include both maternal and paternal consumption in the home environment index.

Maternal learning disabilities

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0	1073	60.5	107.0	12.3	104.0	13.9
1	699	39.5	103.3	13.3	93.9	14.5

Association with FSIQ	*Coef*	*P*
Unadjusted	-3.69	0.000
Adjusted	-.87	0.160

Paternal learning disabilities

	N	*Pct.*	*Mean IQ*	*SD*	*Maternal IQ*	*SD*
0	1111	62.7	107.0	12.4	101.0	14.9
1	661	37.3	103.1	13.2	98.3	15.0

Association with FSIQ	*Coef*	*P*
Unadjusted	-3.86	0.000
Adjusted	-3.11	0.000

We don't adjust for paternal IQ, but still the strong association with offspring IQ is remarkable. Thus, there is no doubt that parental learning disabilities should somehow be included in the statistical analyses, but we tend to think that this should be included as a separate variable and not as part of the home environment index. The reason is that it is not obvious to us that/how parental learning disabilities affect the home environment, in particular not on the parametres relevant for preschool age development.

The index is generated as the total sum of positives/1's higher scores indicating less optimal conditions. Depending on the distribution of this score, a cut—off may be used to obtain a binary variable.

To further investigate the most appropriate way to compose the index, we examined two tentative versions:

Index 1 is composed according to the above considerations and includes: Changes in household composition, breakfast meals, if mother saw doctor due to symptoms of depression, high maternal alcohol consumption, high paternal alcohol consumption ('Child has been away from parents >14 days' was not included because it was slightly positively associated with child FSIQ).

Index 2 includes only the variables that show a clear negative association with FSIQ: Changes in household composition, breakfast meals, and high maternal alcohol consumption.

Below are listed child and maternal full scale IQ scores over each of the indexes.

Index 1

	N	*Child IQ*	*N*	*Maternal IQ*
0	48	97.9	48	97.4
1	1179	106.1	48	100.3
2	427	105.2	429	99.4
3	110	103.6	109	99.8
4	7	108.6	7	101.3
5	1	111	1	117

Index 2

	N	*Child IQ*	*N*	*Maternal IQ*
0	61	97.8	61	95.5
1	1453	106.1	1456	100.5
2	253	104	252	98.3
3	5	99.6	5	99.2