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# Millennium Cohort Study Data Note 1. The home learning environment as measured at age 3

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# **Millennium Cohort Study Data Note 1**

## **The home learning environment as measured at age 3**

**Elise de La Rochebrochard**

**July 2012**

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## Contents

1	Introduction .....	2
2	The HLE index data collected at age 3 (MCS2).....	3
2.1	Item “read to” .....	3
2.2	Item “going to the library” .....	4
2.3	Item “painting and drawing”.....	5
2.4	Item “being taught letters” .....	6
2.5	Item “being taught numbers” .....	6
2.6	Item “songs/poems/rhymes”.....	7
3	The total HLE Index .....	9
3.1	Differences across twins and triplets.....	10
3.2	Published research using HLE quintiles in MCS2 .....	11
	References .....	12
	STATA program .....	13

# 1 Introduction

In an article published in 2008, Melhuish *et al.* investigated the influence of aspects of home environment upon literacy and numeracy achievement at school entry and at the end of the 3<sup>rd</sup> year of school. In their work, they created a “home learning environment index”.<sup>1</sup>

Their data from the Effective Provision of Pre-school Education (EPPE) study was based on 2,857 children in England. All children were recruited in preschool once they reached their third birthday or when they started preschool provided they were already aged 3 years or above. Their mean age at entry to the study was 3 years 5 months (SD = 4.6 months). Information on child activities was collected from the child’s parents or guardians (usually the mother) shortly after initial child assessments. Child assessments were the BAS II (GCA = general cognitive ability) at age ~3 and 5. The initial child assessments took place when the child entered the study.

First, the authors considered 14 activities at age ~3 divided in two groups each containing seven Likert scaled items coded on an 8-point scale (0 = not occurring, 7 = very frequent).

## *social routine activities*

1. play with friends at home
2. play with friends elsewhere
3. visiting relatives/friends
4. shopping
5. TV
6. eating meals with family
7. regular bedtime

## *activities providing clear learning opportunities:*

1. read to
2. going to the library
3. playing with numbers
4. painting and drawing
5. being taught letters
6. being taught numbers
7. songs/poems/rhymes

Each of the 14 home activity items was regressed in separate equations on over or under achievement (labelled ‘unexpected achievements’) in literacy and numeracy at age 5. None of the 7 social/routine activities were statistically significant whereas the 7 activities providing clear learning opportunities had significant positive effects on unexpected achievements. Therefore, a summative index was created with the 7 activities providing learning opportunities. The index has a range of 0–49. The score was normally distributed with a mean of 23.42 (SD = 7.71).

---

<sup>1</sup> The first publication, on the HLE index is a Technical Paper published in 2001 by Melhuish *et al.*

## 2 The HLE index data collected at age 3 (MCS2)

Six of the seven activities used by Melhuish *et al.* have been collected in MSC2:

1. read to
2. going to the library
3. painting and drawing
4. being taught letters
5. being taught numbers
6. songs/poems/rhymes

The variable “playing with numbers” was not been collected in MCS2. Thus, the HLE index varies from 0 to 42 and not from 0 to 49. Edward Melhuish considered that this missing variable is not an issue with two arguments. First, it is the shape of the distribution of HLE that matters not its range (the shape of the distribution should broadly match with a normal distribution). Secondly, it is not the nature of the learning activity that matters in the HLE, it is the very fact that the child actually learns something at home (whatever it is: drawing, singing, letters, numbers, etc). Luke Sibieta remarked that the range of the HLE index is even less of importance when the analysis is based on quintiles of the HLE index as in Dearden *et al.* paper discussed below.

What follows is a univariate analysis of each of the learning activity items listed in the original order as presented to the respondents.

### 2.1 Item “read to”

MCS2 questions:

- Q. How often do you read to ^Jack?
- Q. Does anyone else at home ever read to ^Jack?
- Q. How often does anyone else at home read to ^Jack?

There are 6 possible answers:

- not at all
- less often than once or twice a month
- once or twice a month
- once or twice a week
- several times a week
- every day

Following Melhuish’s advice, a derived variable was constructed “frequency of reading to the child” in order to include both reading by the main respondent and reading by anyone else at home.

This new variable was defined as the higher frequency of the two other variables. For example, if the main respondent read “once or twice a week” and anyone else at home read

to the child “once or twice a month”, the new variable “frequency of reading to the child” was equal to “once or twice a week”. There are two exceptions:

- if both initial variables were “several time a week”, it was considered that the child was read to “every day”
- if both initial variables were “once or twice a week”, it was considered that the child was read to “several time a week”

There are only 6 levels of frequency, not 8. In order to have a scale from 0 to 7 the following code were applied following Melhuish’s advice:

- 0 not at all
- 1 less often than once or twice a month
- 3 once or twice a month
- 5 once or twice a week
- 6 several time a week
- 7 every day

The distribution below indicates that 7 out of 10 children (71%) had a score of 7 (read every day).

. tabulate hlereada

Scale read to in HLE / child c1	Freq.	Percent	Cum.
0	207	1.34	1.34
1	168	1.09	2.43
3	271	1.76	4.18
5	1,017	6.59	10.77
6	2,875	18.62	29.39
7	10,900	70.61	100.00
<b>Total</b>	<b>15,438</b>	<b>100.00</b>	

## 2.2 Item “going to the library”

MCS2 questions:

- Q. Does anyone at home ever take ^Jack to the library?
- Q. How often does someone at home take ^Jack to the library?

There are only 5 levels of frequency, not 8. In order to have a scale from 0 to 7 the following code was applied following Melhuish’s advice:

- 0 not at all
- 1 on special occasions
- 3 once a month
- 5 once a fortnight

7 once a week

Three out of 5 children (60%) never went to the library (with a 0 score).

. tabulate hlelibra

Scale going to library to in HLE / child c1	Freq.	Percent	Cum.
0	9,261	59.99	59.99
1	1,409	9.13	69.12
3	2,542	16.47	85.58
5	1,157	7.49	93.08
7	1,069	6.92	100.00
<b>Total</b>	<b>15,438</b>	<b>100.00</b>	

### 2.3 Item “painting and drawing”

MCS2 questions:

Q. Does ^Jack ever paint or draw at home?

Q. How often does ^Jack paint or draw at home?

MCS2 response categories:

0. not at all
1. occasionally or less than once a week
2. 1-2 days per week
3. 3 times a week
4. 4 times a week
5. 5 times a week
6. 6 times a week
7. 7 times a week / constantly

Just under half of the children (44%) did painting or drawing every day (scored 7)

. tabulate hlepainta

Scale paint & draw in HLE / child c1	Freq.	Percent	Cum.
0	318	2.06	2.06
1	605	3.92	5.98
2	2,197	14.23	20.21
3	1,823	11.81	32.02
4	1,542	9.99	42.01
5	1,305	8.45	50.46
6	862	5.58	56.05
7	6,785	43.95	100.00
<b>Total</b>	<b>15,437</b>	<b>100.00</b>	

## 2.4 Item “being taught letters”

MCS2 questions:

- Q. Does anyone at home ever help ^Jack to learn the ABC or the alphabet?
- Q. How often does someone help ^Jack to learn the ABC or the alphabet?

MCS2 response categories:

- 0. not at all
- 1. occasionally or less than once a week
- 2. 1-2 days per week
- 3. 3 times a week
- 4. 4 times a week
- 5. 5 times a week
- 6. 6 times a week
- 7. 7 times a week / constantly

These responses are recorded irrespective of who provides help to the child.

. tabulate hleal pha

Scale taught letters in HLE / child cl	Freq.	Percent	Cum.
0	2,964	19.20	19.20
1	1,913	12.39	31.59
2	3,343	21.66	53.25
3	1,920	12.44	65.69
4	1,142	7.40	73.08
5	766	4.96	78.05
6	363	2.35	80.40
7	3,026	19.60	100.00
<b>Total</b>	<b>15,437</b>	<b>100.00</b>	

## 2.5 Item “being taught numbers”

MCS2 questions:

- Q. Does anyone at home ever teach ^Jack numbers or counting?
- Q. How often does someone try to teach ^Jack numbers or counting?

MCS2 response categories:

- 0. not at all
- 1. occasionally or less than once a week
- 2. 1-2 days per week



3. 3 times a week
4. 4 times a week
5. 5 times a week
6. 6 times a week
7. 7 times a week / constantly

These responses are recorded irrespective of who provides help to the child.

Almost half of the children (48%) received help with numbers every day.

. tabulate hlenumba

Scale taught numbers in HLE / child	Freq.	Percent	Cum.
0	610	3.95	3.95
1	793	5.14	9.09
2	2,090	13.54	22.63
3	1,655	10.72	33.35
4	1,207	7.82	41.17
5	990	6.41	47.58
6	642	4.16	51.74
7	7,450	48.26	100.00
<b>Total</b>	<b>15,437</b>	<b>100.00</b>	

## 2.6 Item “songs/poems/rhymes”

MCS2 questions:

- Q. Does anyone at home ever teach ^Jack any songs, poems or nursery rhymes?
- Q. How often does someone at home try to teach ^Jack any songs, poems or nursery rhymes?

MCS2 response categories:

0. not at all
1. occasionally or less than once a week
2. 1-2 days per week
3. 3 times a week
4. 4 times a week
5. 5 times a week
6. 6 times a week
7. 7 times a week / constantly

These responses are recorded irrespective of who provides help to the child.

A majority of children (53%) are taught songs, etc, every day.

. tabulate hlesonga

Scale songs, etc in HLE / child c1	Freq.	Percent	Cum.
0	760	4.92	4.92
1	606	3.93	8.85
2	1,611	10.44	19.28
3	1,404	9.10	28.38
4	1,172	7.59	35.97
5	1,070	6.93	42.90
6	652	4.22	47.13
7	8,162	52.87	100.00
Total	15,437	100.00	

### 3 The total HLE Index

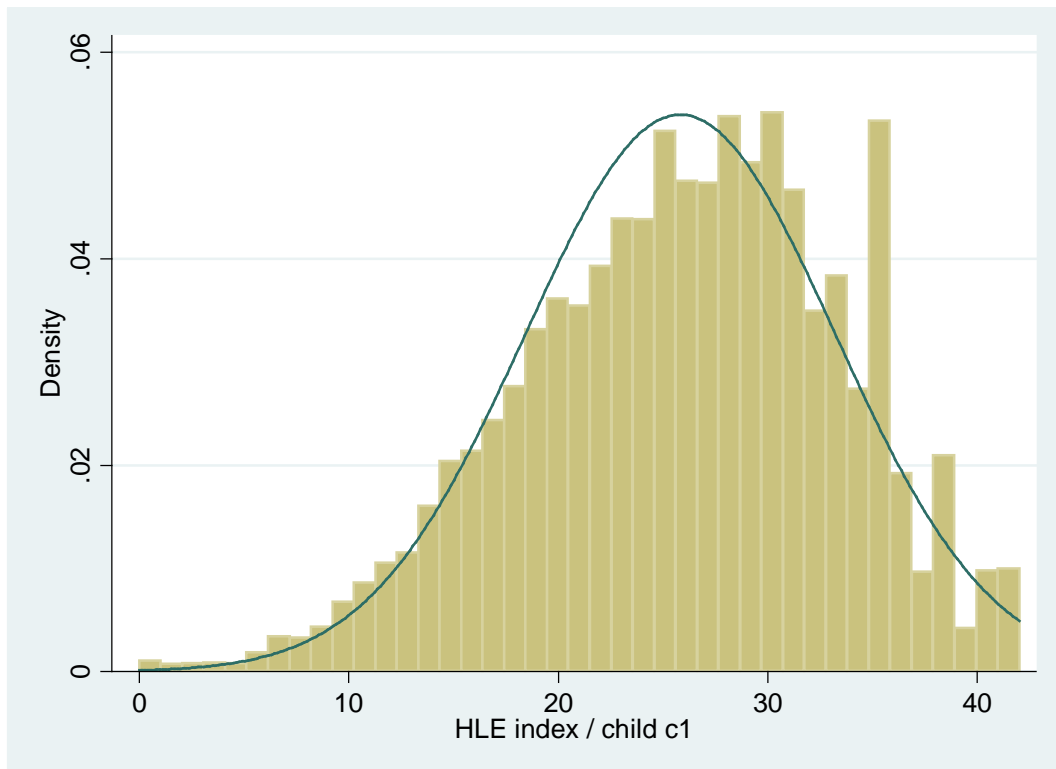
When each scale has been aggregated to produce the HLE index in the MCS the values range from 0-42 and the variable has a mean value of 25.8 for the first cohort child.

```
. sum hlea
```

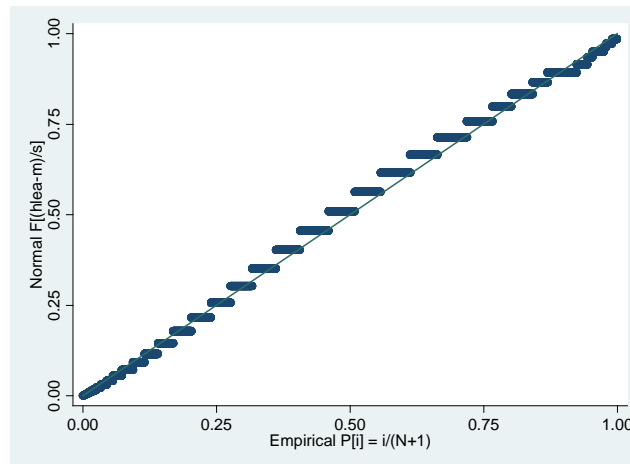
Variable	Obs	Mean	Std. Dev.	Min	Max
hlea	15437	25.82756	7.392983	0	42

The mean is quite high compared to Melhuish's index in EPPE (23.42) considering the MCS2 HLE index only varies between 0 and 42 (and not between 0 and 49). However, it is not the mean of the HLE that matters but the shape of the distribution. The distribution of the HLE in MCS2 (shown below) corresponds to what could be expected and approximates a normal distribution.

Distribution of HLE for child 1 in MCS2:



The HLE index distribution is graphically not incompatible with a normal distribution:



There is a spike in the distribution at 35. For 72% of the first cohort children the HLE index is 35. On further investigation in these cases, all the items are equal to 7 except the library item that is equal to 0.

The descriptives for the HLE for the second and third cohort child are given below:

For child c2:

```
. sum hleb
```

Variable	Obs	Mean	Std. Dev.	Min	Max
hleb	201	26.64179	7.127485	9	42

For child c3:

```
. sum hlec
```

Variable	Obs	Mean	Std. Dev.	Min	Max
hlec	10	30.1	5.384133	21	36

### 3.1 Differences across twins and triplets

Perhaps surprisingly for the second cohort child in the household (twins) 53% of the HLE indexes are different from their twin HLE index. When there are 3 children in the household (triplets) 30% of the HLE indexes are different.

### 3.2 Published research using HLE quintiles in MCS2

The HLE index has been used in one publication based on the MCS2. Dearden *et al.* (2011) constructed a HLE index comparable to Melhuish’s HLE EPPE index. Their HLE index included six activities as the HLE index presented here and their HLE index varied from 0 to 42 as the index presented here (and not seven activities from 0 to 49 as indicated in their paper, pages 24-25). For the variable "read to" coding Dearden *et al.* (2011) used slightly different coding than the coding discussed above. On the advice of Kathy Sylva the variable was coded: 0 = "not at all", 1 = "less often than once or twice a month", 2 = "once or twice a month", 4 = "once or twice a week", 5 = "several times a week", 7 = "every day". For "going to the library" the variable was coded: 0 = "not at all", 3 = "on special occasions", 5 = "once a month", 6 = "once a fortnight", 7 = "once a week".

In their paper Dearden *et al.* divided the HLE index into five equally-sized quintiles. We constructed quintiles on our HLE index as indicated below:

. tabulate hleaGr

Home Learn Envi ron (group quintiles)	Freq.	Percent	Cum.
1	3, 131	20. 28	20. 28
2	3, 142	20. 35	40. 64
3	3, 181	20. 61	61. 24
4	2, 929	18. 97	80. 22
5	3, 054	19. 78	100. 00
<b>Total</b>	<b>15, 437</b>	<b>100. 00</b>	

The quintiles were defined as below:

- quintile 1 = HLE varied from 0 to 19
- quintile 2 = HLE varied from 20 to 24
- quintile 3 = HLE varied from 25 to 28
- quintile 4 = HLE varied from 29 to 32
- quintile 5 = HLE varied from 33 to 42

## References

- MELHUIISH E.C. SYLVA K. SAMMONS P. SIRAJ-BLATCHFORD I. TAGGART B. 2001 The Effective Provision of Pre-school Education Project, Technical Paper 7: Social/behavioural and cognitive development at 3-4 years in relation to family background. London: Institute of Education/DfES.
- MELHUIISH E.C. SYLVA K. SAMMONS P. SIRAJ-BLATCHFORD I. TAGGART B. PHAN M. 2008. Effect of Home Learning Environment and preschool center experience upon literacy and numeracy development in early primary school. *Journal of Social Issues*, 64(1):157-188.
- DEARDEN L. SIBIETA L. SYLVA K. 2011. The socio-economic gradient in early child outcomes: evidence from the Millennium Cohort Study. *Longitudinal and Life Course Studies*, 2(1):19-40.

## STATA program

```
log using "C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index\HLE.log",  
replace
```

```
*-----  
* WHAT?    MCS, Home Learning Environment Index  
* WHO?     Elise de La Rochebrochard  
* WHEN FIRST? 4 AUGUST 2011  
* WHEN LAST? 21 MARCH 2012  
*-----
```

```
version 10.0  
clear all  
set more off  
set memory 712m  
set maxvar 28000  
set matsize 6000
```

```
* cd C:\Elise\Bases_donnees\2000-2010_MCS  
cd C:\Elise\XXXMCS\DATA  
use mcs2_parent_interview.dta, clear  
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index  
save mcs2_hle.dta, replace  
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index  
use mcs2_hle.dta, clear
```

```
keep mcsid  bdnocm00 bmofrea0 bmofreb0 bmofrec0          ///  
            bmtolia0 bmtolib0 bmtolic0 bmoflia0 bmoflib0 bmoflic0 bmsdpaa0 bmsdpab0  
bmsdpac0 ///  
            bmalph0 bmalphb0 bmalphc0 bmofaba0 bmofabb0 bmofabc0 bmnumba0  
bmnumbb0 bmnumbc0 ///  
            bmofcoa0 bmofcob0 bmofcoc0 bmsonga0 bmsongb0 bmsongc0 bmofsoa0  
bmofsob0 bmofsoc0 ///  
            bmdrawa0 bmdrawb0 bmdrawc0 bmpamaa0 bmpamab0 bmpamac0
```

```
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index  
save mcs2_hle.dta, replace
```

```
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index  
use mcs2_b_cm_sos, clear  
sort mcsid  
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index  
save mcs2_b_cm_sos, replace  
describe
```

```
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index  
use mcs2_hle.dta, clear  
sort mcsid  
merge mcsid using mcs2_b_cm_sos.dta  
drop _merge  
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index
```

```
save mcs2_hle.dta, replace
```

```
* Missing value <0 -> =.;
```

```
* CLEANING DATA
```

```
*-----
```

```
foreach var of varlist  bmofrea0 bmofreb0 bmofrec0 bmreela0 bmreelb0 bmreelc0 bmreofa0  
bmreofb0 bmreofc0 ///  
                bmtolia0 bmtolib0 bmtolic0 bmoflia0 bmoflib0 bmoflic0 bmsdpa0  
bmsdpab0 bmsdpac0 ///  
                bmalpha0 bmalphb0 bmalphc0 bmofaba0 bmofabb0 bmofabc0  
bmnumba0 bmnumbb0 bmnumbc0 ///  
                bmofcoa0 bmofcob0 bmofcoc0 bmsonga0 bmsongb0 bmsongc0  
bmofsoa0 bmofsob0 bmofsoc0 ///  
                bmdrawa0 bmdrawb0 bmdrawc0 bmpamaa0 bmpamab0 bmpamac0 {  
replace `var'= . if `var'<0  
}
```

```
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index
```

```
save mcs2_hle.dta, replace
```

```
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index
```

```
use mcs2_hle.dta, clear
```

```
* For each cohort member a/b/c, hle index creation
```

```
*-----
```

```
for each enf in a b c {
```

```
* HLE index child
```

```
*-----
```

```
* scale "read to"
```

```
generate ReadMain=7 if bmofre`enf'0==1  
replace ReadMain=6 if bmofre`enf'0==2  
replace ReadMain=5 if bmofre`enf'0==3  
replace ReadMain=3 if bmofre`enf'0==4  
replace ReadMain=1 if bmofre`enf'0==5  
replace ReadMain=0 if bmofre`enf'0==6
```

```
generate ReadAny=7 if bmreel`enf'0==1 & bmreof`enf'0==1  
replace ReadAny=6 if bmreel`enf'0==1 & bmreof`enf'0==2  
replace ReadAny=5 if bmreel`enf'0==1 & bmreof`enf'0==3  
replace ReadAny=3 if bmreel`enf'0==1 & bmreof`enf'0==4  
replace ReadAny=1 if bmreel`enf'0==1 & bmreof`enf'0==5  
replace ReadAny=0 if bmreel`enf'0==1 & bmreof`enf'0==6  
replace ReadAny=0 if bmreel`enf'0==2 & bmreof`enf'0==.  
replace ReadAny=0 if bmreel`enf'0==2 & bmreof`enf'0==6
```

```
generate hleread`enf'=max(ReadMain,ReadAny) if ReadMain!=. & ReadAny!=.  
replace hleread`enf'=7 if ReadMain==7 & ReadAny==.  
replace hleread`enf'=7 if ReadMain==6 & ReadAny==6
```



```
replace hlelead`enf`=6 if ReadMain==5 & ReadAny==5
drop ReadMain ReadAny
```

```
* scale "going to the library"
```

```
generate hlelibr`enf`=0 if bmtoli`enf`0==2
replace hlelibr`enf`=1 if bmtoli`enf`0==1 & bmofli`enf`0==1
replace hlelibr`enf`=3 if bmtoli`enf`0==1 & bmofli`enf`0==2
replace hlelibr`enf`=5 if bmtoli`enf`0==1 & bmofli`enf`0==3
replace hlelibr`enf`=7 if bmtoli`enf`0==1 & bmofli`enf`0==4
```

```
* scale "playing with number"
```

```
* scale "painting and drawing"
```

```
generate hlepaint`enf`=0 if bmdraw`enf`0==2
replace hlepaint`enf`=1 if bmdraw`enf`0==1 & bmpama`enf`0==1
replace hlepaint`enf`=2 if bmdraw`enf`0==1 & bmpama`enf`0==2
replace hlepaint`enf`=3 if bmdraw`enf`0==1 & bmpama`enf`0==3
replace hlepaint`enf`=4 if bmdraw`enf`0==1 & bmpama`enf`0==4
replace hlepaint`enf`=5 if bmdraw`enf`0==1 & bmpama`enf`0==5
replace hlepaint`enf`=6 if bmdraw`enf`0==1 & bmpama`enf`0==6
replace hlepaint`enf`=7 if bmdraw`enf`0==1 & bmpama`enf`0==7
```

```
* scale "being taught letters"
```

```
generate hlealph`enf`=0 if bmalph`enf`0==2
replace hlealph`enf`=1 if bmalph`enf`0==1 & bmofab`enf`0==1
replace hlealph`enf`=2 if bmalph`enf`0==1 & bmofab`enf`0==2
replace hlealph`enf`=3 if bmalph`enf`0==1 & bmofab`enf`0==3
replace hlealph`enf`=4 if bmalph`enf`0==1 & bmofab`enf`0==4
replace hlealph`enf`=5 if bmalph`enf`0==1 & bmofab`enf`0==5
replace hlealph`enf`=6 if bmalph`enf`0==1 & bmofab`enf`0==6
replace hlealph`enf`=7 if bmalph`enf`0==1 & bmofab`enf`0==7
```

```
* scale "being taught numbers"
```

```
generate hlenumb`enf`=0 if bmnumb`enf`0==2
replace hlenumb`enf`=1 if bmnumb`enf`0==1 & bmofco`enf`0==1
replace hlenumb`enf`=2 if bmnumb`enf`0==1 & bmofco`enf`0==2
replace hlenumb`enf`=3 if bmnumb`enf`0==1 & bmofco`enf`0==3
replace hlenumb`enf`=4 if bmnumb`enf`0==1 & bmofco`enf`0==4
replace hlenumb`enf`=5 if bmnumb`enf`0==1 & bmofco`enf`0==5
replace hlenumb`enf`=6 if bmnumb`enf`0==1 & bmofco`enf`0==6
replace hlenumb`enf`=7 if bmnumb`enf`0==1 & bmofco`enf`0==7
```

```
* scale "songs/poems/rhymes"
```

```
generate hlesong`enf`=0 if bmsong`enf`0==2
replace hlesong`enf`=1 if bmsong`enf`0==1 & bmofso`enf`0==1
replace hlesong`enf`=2 if bmsong`enf`0==1 & bmofso`enf`0==2
replace hlesong`enf`=3 if bmsong`enf`0==1 & bmofso`enf`0==3
replace hlesong`enf`=4 if bmsong`enf`0==1 & bmofso`enf`0==4
replace hlesong`enf`=5 if bmsong`enf`0==1 & bmofso`enf`0==5
replace hlesong`enf`=6 if bmsong`enf`0==1 & bmofso`enf`0==6
replace hlesong`enf`=7 if bmsong`enf`0==1 & bmofso`enf`0==7
```

```
* hle index
```

```

generate
hle`enf`=hleread`enf'+hlelibr`enf'+hlepaint`enf'+hlealph`enf'+hlenumb`enf'+hlesong`enf' ///
if hleread`enf'!=. & hlelibr`enf'!=. & hlepaint`enf'!=. & hlealph`enf'!=. & hlenumb`enf'!=. &
hlesong`enf'!=.

}

```

```

label var hlereada "Scale read to in HLE / child c1"
label var hlereadb "Scale read to in HLE / child c2"
label var hlereadc "Scale read to in HLE / child c3"
label var hlelibra "Scale going to library to in HLE / child c1"
label var hlelibrb "Scale going to library to in HLE / child c2"
label var hlelibrc "Scale going to library to in HLE / child c3"
label var hlepainta "Scale paint & draw in HLE / child c1"
label var hlepaintb "Scale paint & draw in HLE / child c2"
label var hlepaintc "Scale paint & draw in HLE / child c3"
label var hlealpha "Scale taught letters in HLE / child c1"
label var hlealphb "Scale taught letters in HLE / child c2"
label var hlealphc "Scale taught letters in HLE / child c3"
label var hlenumba "Scale taught numbers in HLE / child c1"
label var hlenumbb "Scale taught numbers in HLE / child c2"
label var hlenumbc "Scale taught numbers in HLE / child c3"
label var hlesonga "Scale songs, etc in HLE / child c1"
label var hlesongb "Scale songs, etc in HLE / child c2"
label var hlesongc "Scale songs, etc in HLE / child c3"
label var hlea "HLE index / child c1"
label var hleb "HLE index / child c2"
label var hlec "HLE index / child c3"

```

```

cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index
save mcs2_hle.dta, replace
cd C:\Elise\Travail\CLS_London\Analysis\2011._HomeLearningEnvironment_Index
use mcs2_hle.dta, clear

```

```

tabulate hlereada
tabulate hlelibra
tabulate hlepainta
tabulate hlealpha
tabulate hlenumba
tabulate hlesonga
tabulate hlea
sum hlea
hist hlea, normal
graph save graphhle11, replace
pnorm hlea
graph save graphhle12, replace
swilk hlea
sktest hlea
sfrancia hlea

```

```

tabulate hlereada if hlea==35
tabulate hlelibra if hlea==35
tabulate hlepainta if hlea==35

```

```
tabulate hlealpha if hlea==35
tabulate hlenumba if hlea==35
tabulate hlesonga if hlea==35
tabulate hlelibra if hlereada==7 & hlepainta==7 & hlealpha==7 & hlenumba==7 &
hlesonga==7
```

```
tabulate hlereadb
tabulate hlelibrb
tabulate hlepaintb
tabulate hlealphb
tabulate hlenumbb
tabulate hlesongb
tabulate hleb
sum hleb
hist hleb, normal
graph save graphhle21, replace
pnorm hleb
graph save graphhle22, replace
swilk hleb
sktest hleb
sfrancia hleb
```

```
tabulate hlereadc
tabulate hlelibrc
tabulate hlepaintc
tabulate hlealphc
tabulate hlenumbc
tabulate hlesongc
tabulate hlec
sum hlec
hist hlec, normal
graph save graphhle31, replace
pnorm hlec
graph save graphhle32, replace
swilk hlec
sktest hlec
sfrancia hlec
```

\* Same hle for children in a household?

```
generate testhle=.
replace testhle=1 if bdnocm00==2 & hlea!=hleb
replace testhle=0 if bdnocm00==2 & hlea==hleb
replace testhle=1 if bdnocm00==3 & (hlea!=hleb | hlea!=hlec | hlec!=hleb)
replace testhle=0 if bdnocm00==3 & hlea==hleb & hleb==hlec
```

```
tab testhle if bdnocm00==2, missing
tab testhle if bdnocm00==3, missing
```

```
drop testhle bdnocm00
```

\* Quintiles

```
xtile hleaGr=hlea, n(5)
```

```
label var hleaGr "Home Learn Environ (group quintiles)"
tabulate hleaGr
tabulate hlea hleaGr, missing

drop hleaGr

log close
```