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# Parental Influence on Children's Unhealthy Lifestyle Activities in Uk

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# **PARENTAL INFLUENCE ON CHILDREN'S UNHEALTHY LIFESTYLE ACTIVITIES IN UK**

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## **Abstract**

It is generally considered that parental lifestyle activities affect children. It is said that parents are an important influence on their children's behavior and that the habits pass from generation to generation. It is true that children consider their parents as role-models and it is more likely to behave similar to them adopting their healthy or unhealthy activities. However, there are other factors that can affect children's behavior throughout the years such as their friends, the social class, family finances etc.

This study aims at examining how parental lifestyle activities are transmitted. We use the Sixteen-year Follow-up (1986, 16-year old individuals) of the British Cohort Study 1970 Database, where data are collected from individuals born in England, Scotland, Wales and Northern Ireland, in a specific week in April 1970. A sample of 11,615 16-year old boys and girls is taken in order to see how the smoking, alcohol drinking and physical activity of their parents are affecting their lifestyle. Other factors are also taken into account i.e. the number of natural parents and any possible financial hardship of the family.

The analysis is conducted using logistic regression, indicating that the selected independent variables can explain the influences on the dependent variables. Results show great parental influence on children's drinking, children's smoking and children's physical activity. A significant peer influence is also shown for children's smoking. Children tend to smoke more if their friends smoke. Father's employment status plays only a small role on children's drinking habits, though not as expected. If the father is unemployed, children are less likely to drink or smoke. There is no influence by the presence of family financial hardships or the number of natural parents. As a conclusion, our findings suggest that parental and peer habits exert great influence on children's lifestyles.

**JEL:**I10,I18,C35,H35,

**Keywords:** parental lifestyle, children's behavior, intergenerationally transmission, logit regression.

## 1. Introduction

Many studies have been conducted in order to estimate the level of influence imposed on adolescents from their environment. Results have shown that in general children are influenced by their parents and peers regarding their activities directly connected to their health; yet, there have been some studies that contradict this theory illustrating that it is not as strong as it has been generally believed.

In fact, the studies mentioned herewith use different methods of eliciting results, different sample sizes, various age ranges, distinct geographical areas etc. Therefore, it would be essential to study in depth whether children at sensitive age of adolescence are influenced by their parents and friends regarding their health behaviors and to what extent. Attention is drawn to the areas of smoking, drinking, and exercise.

This project aims to discover whether children in their adolescence are influenced by parental lifestyles they are subject to and whether or not they imitate such healthy or unhealthy habits analyzing a segment of 11,615 16-years old boys and girls born in England, Scotland, Wales and Northern Ireland.

In the present study we will focus on the Sixteen-year Follow-up 1986 survey of the British Cohort Study 1970 conducted by the International Centre for Children's Studies.

Children are in the sensitive age of 16 years old and thus are vulnerable to any stimulus and easily influenced by the actions of other people surrounding their environment. They undergo a transitional period as the schooling years come to an end and they have to make important decisions for their future. Furthermore, the relationship between parents and children changes at this particular age. Smoking, excessive drinking, malnutrition and drug use are habits that children mostly begin at this age<sup>1</sup>. More specifically, the main questions that we will try to address in this project are the following: explore the possible reasons of children's alcohol use, investigate the possible reasons of children's smoking, examine the factors that influence children's physical activity. The regression models were

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<sup>1</sup>Berndt, T.J. (1979). Developmental changes in conformity to peers and parents, *Developmental Psychology*, 15: 608-616; Kandel, D. B., & Lesser, G. S.(1972). *Youth in two worlds*, San Francisco: Jossey-Bass.

Lau, Richard R.(1990).Development and change of young adults' preventive health beliefs and behavior: Influence from parents and peers, *Journal of Health and Social Behavior*, Vol.31: 240-259

performed using STATA version 10. The econometric model employed is that of logistic regression.

## 2. Adolescent Smoking

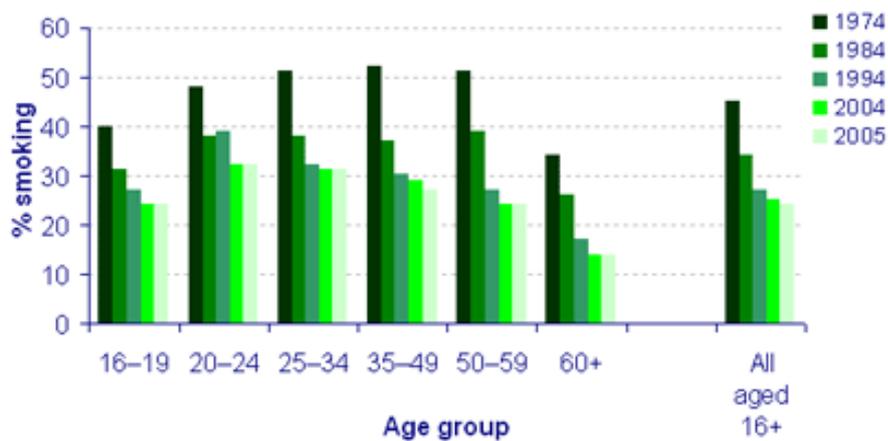
Smoking is an unhealthy habit which research has shown that adolescents are more likely to adopt if their parents also smoke<sup>2</sup>. According to the World Health Organization (2002), 20% of the young population aged 13-15 worldwide smokes and approximately 50% of those who start smoking in their adolescence continue smoking for 15 to 20 years.

As we can also see from **Figure 1.1**, 40% of children aged 16-19 living in Great Britain smoked in 1974. This has been reduced throughout the years and approximately 24% of children of the same age smoked in 2005. This is also shown in **Figure 1.2** for the year 2006 which also depicts sex related smoking activities. Parental age groups from 35 and above have also reduced smoking within the years and this is probably what has influenced children's behavior against smoking. This reduction is due to increasing restrictions in smoking through norms in the last decade at public places<sup>3</sup>. **Figure 1.3** shows the prevalence of cigarette smoking by sex in different areas throughout England.

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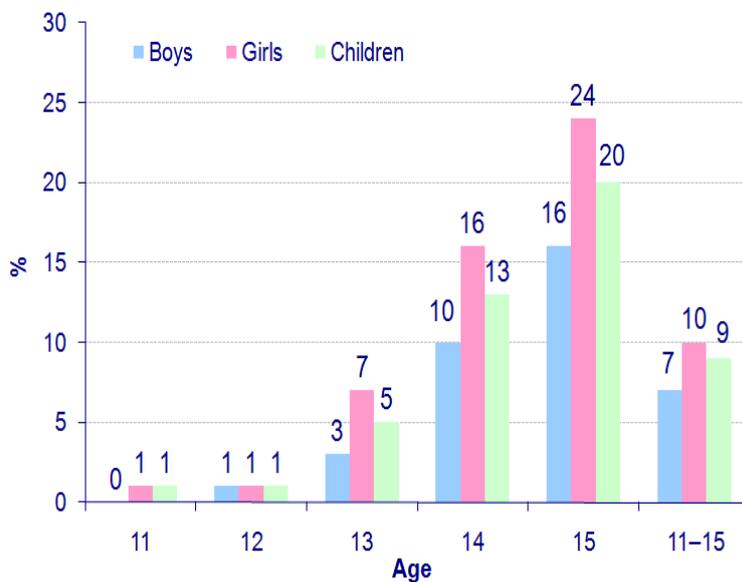
<sup>2</sup> Farkas et al. (1999) suggested that parental smoking cessation influences children and discourages them to smoke. After analyzing a cross-sectional sample of 4,502 adolescents aged 15-17 years old, they concluded that the timing that parents quit smoking is really important and the younger the child is the less likely it would start smoking. Doherty and Allen (1994), after running a logistic regression of adolescent smoking status on parental smoking and family functioning variables, concluded that a combination of low family cohesion and parental smoking is a significant factor of urging adolescence to smoke.

<sup>3</sup> To have an example for what is happened in another country, we can see J. Pinilla et al (2009) that performed a multilevel logistic regression using a sample of 1,877 students from 30 secondary schools in Spain and concluded that the prevention or at least the delay of adolescent smoking is also achieved by enforcing no smoking rules at schools.



**Figure 1.1:** Prevalence of cigarette smoking by age, person aged 16 and over, Great Britain, 1974-2005

**Source:** Cancer Research UK website [www.cancerresearchuk.org](http://www.cancerresearchuk.org)



**Figure 1.2:** Percentage of children smoking regularly by age, England, 2006

**Source:** Cancer Research UK website [www.cancerresearchuk.org](http://www.cancerresearchuk.org)



**Figure 1.3:** Prevalence of cigarette smoking by sex, England and Government Office Regions, 2005

**Source:** Cancer Research UK website [www.cancerresearchuk.org](http://www.cancerresearchuk.org)

### 3. Adolescent alcohol use

Alcohol use is an extremely bad habit which is, in the UK quite often introduced to children by their parents, usually when they want to celebrate a special occasion<sup>4</sup>. About 90% of children are said to have tasted alcohol by the age of 16. Alcohol is thought to be very important for children at that age, as it is considered a tool of socialization with peers and a step towards adulthood. Evidence for the United Kingdom has shown that children of 13 to 16 are the most frequent consumers of alcoholic products<sup>5</sup>. The age of the

<sup>4</sup>“Use of alcohol among children and young people”, Final Report, 2008, Department for children, schools and families of UK.

<sup>5</sup>This may have a great effect on children having a risky behavior but also on their education and on the occurrence of accidents. Murray & Lopez (1994) have found that 5% of all deaths of individuals aged 5 to 29 in 1990 were attributed to alcohol consumption.

initiation to alcohol is extremely important<sup>6</sup>. The following tables show the prevalence of alcohol use by 15 year olds in several European countries.

#### **4. Adolescent physical activity**

Physical activity is also considered a very important factor of children's health<sup>7</sup>. There are several studies that have examined parental influence on adolescent's physical activity. According to NHS, using data from the Health Survey for England (HSE), children whose both parents do regular exercise are more likely to report high levels of physical activity. This is also shown on **Table 1.3**. Results from other studies differ depending on the types of measures that each study used<sup>8</sup>.

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<sup>6</sup> Grant & Dawson (1997) performed an analysis using data from the National Longitudinal Alcohol Epidemiological Survey and showed that 40% of the cohort members that declared they had drunk alcohol before the age of 14 became alcohol addicts, in contrast with the members that declared that had drunk alcohol over the age of 20, who were only 10%. Moreover, David J. DeWit et al. (2000), using a survival analysis model, showed that children who start drinking at the ages of 11-14 are more likely to have alcohol disorders in the future.

<sup>7</sup> This has been shown by Henning Bodersen et al. (2007) who showed that British students have reduced their physical activity since 1999. More specifically, they concluded that girls had a greater reduction (46%) in physical activity than boys (23%).

<sup>8</sup>For example, Moore et al (1991) -who examined objectively the individuals' physical activity with a mechanical device along with other factors such as parents' serving as role models, encouragement on training, sharing on activities between the members of the family etc - found positive correlation between parents' physical activity and adolescents' exercise. Anderssen & Wold (1992) presented a study with children reports for their parents' physical activities and also found positive correlation between peer/parental physical activity and adolescent exercise. However, other studies that used measures of parental self-reports of physical activity found minimal or no effects on adolescents' exercise (McMurray et al. (1993); Trost et al. (2003)).

**Table 1.1 Alcohol use among 15 year-olds in 26 European countries in 1997**

Country	Lifetime Prevalence		Weekly Prevalence		Drunk twice or more	
	M %	F %	M %	F %	M %	F %
Austria	94	96	39	23	49	36
Belgium (Flemish)	94	92	38	22	33	22
Czech Republic	98	97	32	19	36	22
Denmark	95	96	46	38	71	63
England	96	96	47	36	51	52
Estonia	96	96	21	10	44	23
Finland	94	95	11	8	52	58
France*	87	85	31	15	29	20
Germany*	94	94	29	22	36	31
Greece	96	96	52	31	24	21
Hungary	91	93	29	11	43	22
Ireland	93	94	27	12	42	29
Israel	78	62	26	10	18	10
Latvia	97	95	28	12	47	23
Lithuania	97	97	16	9	32	20
Northern Ireland	94	90	33	20	53	44
Norway	84	86	16	12	37	41
Poland	82	81	20	8	39	21
Portugal	88	95	29	9	35	16
Russian Federation*	94	95	28	24	32	25
Scotland	98	98	37	33	53	56
Slovak Republic	97	98	32	16	49	31
Sweden	96	95	17	11	40	40
Switzerland	87	83	19	9	25	16
Wales	98	98	53	36	72	63

\*France, Germany and the Russian Federation are represented only by regions.

**Source:** *Cabhin & Francois 2000*

**Table 1.2 Alcohol use among 15 to 16 year-olds in selected European countries, 1999**

Country	Lifetime Use (40 Times or More)			Used 10 Times or More in Last 30 Days			Binge Drinking <sup>1</sup> in Last 30 Days		
	M %	F %	Total %	M %	F %	Total %	M %	F %	Total %
Bulgaria	21	12	16	6	4	5	12	6	11
Croatia	24	10	18	9	3	6	15	7	12
Cyprus	32	12	21	14	4	8	18	8	12
Czech Republic	51	32	41	21	8	14	25	11	17
Denmark	66	53	59	23	13	18	37	22	30
Estonia	27	17	21	5	3	4	18	12	14
Faroe Islands	29	17	23	3	2	4	21	8	15
Finland	21	19	20	2	1	1	21	15	18
France	28	13	20	12	5	8	16	7	12
The former Yugoslav Republic of Macedonia	14	5	9	6	1	3	14	4	9
Greece	54	33	42	19	11	13	13	5	9
Hungary	17	9	13	6	2	5	18	8	12
Iceland	15	14	14	1	1	1	18	15	17
Ireland	41	39	40	18	16	16	32	32	31
Italy	23	13	17	12	4	7	-	9	-
Latvia	24	17	20	4	2	2	19	5	14
Lithuania	29	17	23	9	6	8	12	8	9
Malta	44	29	36	25	16	20	25	23	22
Norway	18	13	16	3	1	3	26	23	24
Poland	35	18	26	12	5	8	41	23	31
Portugal	21	10	15	9	4	6	10	4	6
Romania	27	12	18	7	2	4	9	2	5
Russian Federation (Moscow)	34	26	30	11	5	8	20	12	16
Slovak Republic	31	23	27	9	5	7	12	7	8
Slovenia	29	16	23	10	5	8	29	19	25
Sweden	23	15	19	2	1	2	22	13	17
Ukraine	18	18	18	5	4	5	12	8	10
United Kingdom	51	43	47	17	13	16	33	27	30

**Source:** Swedish Council for Information on Alcohol and Other Drugs (CAN) Website: [www.can.se](http://www.can.se)

**Table 1.3 Children's physical activity levels by parental physical activity category, by age and gender, 2006**

England	Percentages					
	Father's physical activity category			Mother's physical activity category		
	High	Medium	Low	High	Medium	Low
<b>Boys 2-10</b>						
High <sup>3</sup>	68	68	59	79	65	55
Medium	19	17	25	12	18	22
Low	13	15	15	9	18	23
<b>Boys 11-15</b>						
High <sup>3</sup>	75	72	66	76	70	62
Medium	15	15	13	16	16	18
Low	10	12	21	8	14	20
<b>Girls 2-10</b>						
High <sup>3</sup>	67	60	56	73	62	49
Medium	18	21	24	13	20	27
Low	15	19	20	14	18	24
<b>Girls 11-15</b>						
High <sup>3</sup>	53	48	31	68	48	41
Medium	26	18	22	14	23	24
Low	21	36	47	27	29	35
<i>Bases (unweighted)</i>						
Boys aged 2-10	255	174	135	327	356	248
Boys aged 11-15	143	99	94	196	206	142
Girls aged 2-10	243	195	145	306	381	232
Girls aged 11-15	142	110	76	128	222	176
<i>Bases (weighted)</i>						
Boys aged 2-10	232	174	132	311	355	239
Boys aged 11-15	136	95	98	139	203	189
Girls aged 2-10	214	178	137	272	347	222
Girls aged 11-15	132	104	79	163	218	124

1. Children: high = 60 minutes or more on all 7 days; medium = 30-59 minutes on all 7 days; low = lower level of activity

2. Adults: high = 30 minutes or more activity of at least moderate intensity on at least 5 days a week; medium = 30 minutes or more of at least moderate intensity on 1 to 4 days a week; low = lower levels of activity

3. Based on assumption that all activity was of at least moderate intensity, this group represents those who met the physical activity recommendations for at least moderate intensity activity a day

**Source:** Health Survey for England 2006. The Information Centre

## 5. Source of data

The Economic Social Data Service (ESDS) has conducted a study that lasted from 1970 until today called the British Cohort Study 1970 (BCS70). This is a longitudinal study constituting several waves of including variables regarding everyday life of parents and children. The data of this survey has been collected from 11,615 children and their families, born in England, Scotland, Wales and Northern Ireland, in a specific week in April 1970.

The Sixteen-year Follow-up 1986 survey is originally called the “Youthscan” and was conducted by the International Centre for Child Studies- University of Bristol. A number of 11,615 is the total segment<sup>9</sup> of children born: 5,815 male (50.06%) and 5,800 female (49.94%). The purpose of this study was to review and evaluate the health care, education and social and family environment of the same adolescents that had already been examined in the previous surveys throughout Great Britain.

Since BCS70 began, there have been eight full data collection exercises in order to monitor the cohort members' health, education, social and economic circumstances. These took place when respondents were aged 5, in 1975, aged 10, in 1980, aged 16 in 1986, aged 26 in 1996, aged 30, 1999-2000 aged 34, in 2004-2005 and aged 38, in 2008-2009 (forthcoming). In this sweep, sixteen separate survey instruments were employed, including parental questionnaires, school class and head teacher questionnaires and medical examinations (including measurement of height, weight and head circumference) by enlisting the cooperation of Local Education Authorities (LEAs) and Regional Councils (RCs) (Scotland) to trace the whereabouts of cohort children who were on their secondary school registers (The Educational Pack was the instrument used).

District Health Authorities (DHAs) and Health Boards (HBs) in Scotland would be asked to cooperate and to appoint a medical and/or nurse coordinator with the remit to arrange for each study member a home interview and a medical examination with completion of a Health Pack. Whilst this was adopted with extra measures had to be introduced to cover the shortage of available teacher time and the higher number of children who left secondary school before the sweep could be accomplished due to the delay in starting the sweep. The cohort members completed questionnaires, kept two four-day diaries (one for nutrition and one for general activity), and

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<sup>9</sup> See: <http://www.esds.ac.uk/findingData/snDescription.asp?sn=3535>, methodology.

undertook some educational assessment. The Method of Data Collection was Postal survey and no weighting variable in the dataset. The target was 16,500, and 11,622 were obtained.

## 6. Modelling

In our model the estimation is conducted by an ordered logit model.

$$\ln\{P(Y>j/\mathbf{X})/P(Y\leq j/\mathbf{X})\}=x_1\beta_1+\dots+x_k\beta_k-\tau_{j+1}$$

where:

*Y* is ordered categorical dependent variable;

*X* are the explanatory variable;

*J* is a generic level of *Y*;

*X<sub>h</sub>* is a generic explanatory variable (*h*=1, ..., *K*)

We have applied this particular type of model because of the nature of dependent variables: they are categorical and more specifically ordinal variables constituted of more than two ranked levels.

The tables below represents the description of variables used in the models. They are reported as they described on the database<sup>10</sup> used.

We selected the variables below due to the goal of our project: the aim is to consider how the family situation of a 16 years old can affect their health behavior. Since 16 year olds are deeply influenced by their peers we have also take into account this factor as well.

Furthermore we considered that family behavior should be considered as well especially due to their employment & financial setup. In addition we took into consideration the number of natural parents still alive.

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<sup>10</sup> <http://www.cls.ioe.ac.uk/datadictionary>.

Tab.1.4 Description of variables used in the models.

	<b>Acronym</b>	<b>Variable Name</b>	<b>Description of variable</b>
1	hd1	How often in the past year did you drink alcohol?	<p>It is an ordinal discrete variable that describes the times that the child drank alcohol during the past year. The question is answered from the child. It includes the following answers:</p> <ul style="list-style-type: none"> <li>• every day/most days</li> <li>• 4-5 times/week</li> <li>• 2-3 times/week</li> <li>• about once/week</li> <li>• about once/month</li> <li>• special occs only</li> <li>• never drank</li> </ul>
2	og2.6	Does your husband smoke at all?	<p>It is a categorical variable which is answered by the mother, regarding her husband's smoking. It considers the following values:</p> <ul style="list-style-type: none"> <li>• yes, cigarettes</li> <li>• yes cigars pipes etc</li> <li>• not sure-prob smokes</li> <li>• never smoked</li> <li>• no but ex-smoker</li> </ul>
3	og2.11	Do you(mother) smoke at all?	<p>It is a categorical variable which is answered by the mother and describes her smoking habits. It considers the following values:</p> <ul style="list-style-type: none"> <li>• yes, cigarettes</li> <li>• yes cigars pipes etc</li> <li>• not sure-prob smokes</li> <li>• never smoked</li> </ul>

			<ul style="list-style-type: none"> <li>• no but ex-smoker</li> </ul>
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4	pg8.2	How often does your husband drink alcoholic beverages?	<p>It is also a categorical variable which comes from a maternal self-completion form and describes the frequency of father's alcohol drinking. It considers the following values:</p> <ul style="list-style-type: none"> <li>• very rarely/never</li> <li>• once a month</li> <li>• or 3 times a month</li> <li>• once or twice a week</li> <li>• or 4 times a week</li> <li>• every or most days</li> </ul>
5	pg8.3	How often do you (Mother) drink alcoholic beverages?	<p>It is also answered by the mother and describes her own frequency of alcohol drinking. The values it considers are the same as the previous:</p> <ul style="list-style-type: none"> <li>• very rarely/never</li> <li>• once a month</li> <li>• or 3 times a month</li> <li>• once or twice a week</li> <li>• or 4 times a week</li> <li>• every or most days</li> </ul>
6	c6.16	Is the father employed or unemployed?	<p>It is a binary variable which describes whether the father is employed or unemployed and it considers the following values:</p> <ul style="list-style-type: none"> <li>• employed</li> </ul>

			<ul style="list-style-type: none"> <li>• unemployed</li> </ul>
7	c6.18	How many cigarettes do you smoke a week?	<p>It is answered by the children and it describes their smoking habits during the past year. It considers the following values:</p> <ul style="list-style-type: none"> <li>• none</li> <li>• less than one</li> <li>• 1-4</li> <li>• 5-20</li> </ul>
8	gh25.4	Does your best friend smoke?	<p>It is a categorical variable, answered by the children and describes if and how often children's best friends smoke. It considers the following values:</p> <ul style="list-style-type: none"> <li>• not at all</li> <li>• sometimes</li> <li>• often</li> <li>• don't know</li> </ul>
9	pm4.17	Does your husband exercise to maintain a healthy lifestyle?	<p>It is a binary response variable, answered by the mother, and indicates whether the father exercises. It considers the following responses:</p> <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul>
10	pm4.11	Do you (mother) exercise to maintain a healthy lifestyle?	<p>It is a binary response variable, answered by the mother and it shows whether the mother exercises. It considers the</p>

			<p>following responses:</p> <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul>
11	pm4.5	Does your child exercise?	<p>It is a binary response variable, answered by the mother and it shows whether the teenager exercises. It considers the same responses as the previous variable:</p> <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> </ul>
12	oa11.4	Please state the number of natural parents living with the 16 year old child?	<p>It is a categorical variable, answered by the mother and it describes the number of the natural parents living with the child at age 16. It considers the following values:</p> <ul style="list-style-type: none"> <li>• both natural parents</li> <li>• natural mother</li> <li>• natural father</li> <li>• neither natural parents</li> </ul>
13	oe4.1	Has the family been troubled by financial hardship in the past year?	<p>This is a categorical variable, answered also by the mother and it describes whether the family has been seriously troubled by financial hardship during the past 12 months. It considers the following values:</p> <ul style="list-style-type: none"> <li>• yes</li> <li>• no</li> <li>• uncertain</li> <li>• don't know</li> </ul>

We herewith present three regression models: in the first two, the dependent variables have more than two categories (“hd1” has 7 categories and “c6.18” has 4) whilst in the last model the dependent variable “pm4.5” is binary.

The regressions are run on the STATA version 10 and the results are obtained automatically<sup>11</sup>.

In our model (the scheme below refers to first estimation): we make the comparisons between the different levels of the dependent variable. Of course the odds ratio remains the same in all 6 equations<sup>12</sup>.

Equation 1:	1	compared to	2, 3, 4, 5, 6, 7
Equation 2:	1, 2	compared to	3, 4, 5, 6, 7
Equation 3:	1, 2, 3	compared to	4, 5, 6, 7
Equation 4:	1, 2, 3, 4	compared to	5, 6, 7
Equation 5:	1, 2, 3, 4, 5	compared to	6, 7
Equation 6:	1, 2, 3, 4, 5, 6	compared to	7

We will now try to explore the possible reasons of children’s alcohol use, running a logistic regression. The dependent variable is “how often in the past year did you drink alcohol?” (hd1) and it has seven ordered categories, every day/most days, 4-5 times/week, 2-3 times/week, about once/week, about once/month, special occasions only, never drink. The information for this variable is shown on table 3.1 (the statistical information reported by data base used is only the frequency )

In table 3.2, we can see all explanatory variable used and the results of the ordered logic reporting the **odds ratio** estimations.

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<sup>11</sup>We can only interpret the qualitative effect they have on the dependent variable via their sign (positive or negative effect). This regression involves a multi-equation model; in our first model there are 6 equations because there are 7 levels in our dependent variable . The ordered logit model is also known as the proportional-odds model because the odds ratio of the event is independent of the levels of the dependent variable. This means that the odds ratio is assumed to be equal for all the levels of the dependent variable. For our purpose the score test for the Proportional Odds Assumption is Chi-Square = 2.4917 with 3 DF (p=0.4768) hence the assumption is verified.

<sup>12</sup> Because of the assumption of proportional odds ratio. See previous note.

A positive odds ratio (odds ratio >1) indicates an increased chance that an individual with a greater independent variable will have a higher category than the dependent variable.

## 6. Results: alcohol use

**Table 3.1** Dependent Variable for children's alcohol use

<b>Number of obs = 2980</b>		<b>LR chi2(19) =300.18</b>	
<b>Log likelihood = -4825.8918</b>		<b>Prob &gt; chi2 = 0.0000</b>	
<i>Dependent Variable</i>	<i>Categories</i>	<i>Level of Category</i>	<i>Frequency (%)</i>
<b>How often in the past year did you drink alcohol?</b>	every day/most days	1	86 (1.41)
	4-5 times/week	2	227 (3.73)
	2-3 times/week	3	1,073 (17.65)
	about once/week	4	1,752 (28.81)
	about once per month	5	846 (13.91)
	special occs only	6	1,557 (25.60)
	never drink	7	540 (8.88)

**Table 3.2** Estimates from the ordered logic of adolescent drinking habits using odds ratios

<i>Explanatory Variables</i>	<i>Categories</i>	<i>Odds Ratios</i>	<i>Std. Error</i>	<i>z</i>	<i>p&gt; z </i>
<b>Does the husband smoke at all?</b>	yes, cigarettes (1)	1.04	0.0975853	0.45	0.655
	yes cigars pipes etc (2)	0.81	0.1035574	-1.62	0.106
	not sure-prob smokes (3)	1.43	1.043051	0.50	0.620
	never smoked (4)	-	-	-	-
	no but ex-smoker (5)	0.89	0.0763388	-1.37	0.171
<b>Do you (mother) smoke at all?</b>	yes, cigarettes (1)	0.83	0.0727808	-2.18	0.029
	yes cigars pipes etc (2)	1.06	0.6011338	0.11	0.915
	not sure-prob smokes (3)	1.06	1.52806	0.04	0.968
	never smoked (4)	-	-	-	-
	no but ex-smoker (5)	0.92	0.0797702	-0.96	0.338
<b>How often does your husband consume alcoholic beverages?</b>	very rarely/never (1)	-	-	-	-
	once a month (2)	0.91	0.1568552	-0.53	0.596
	2 or 3 times a month (3)	0.61	0.0947307	-3.14	0.002
	once or twice a week (4)	0.57	0.0717891	-4.43	0.000
	or 4 times a week (5)	0.53	0.0771685	-4.31	0.000
	every or most days (6)	0.47	0.076185	-4.67	0.000
<b>How often do you (mother) consume alcoholic beverages?</b>	very rarely/never (1)	-	-	-	-
	once a month (2)	0.71	0.0956716	-2.56	0.010
	2 or 3 times a month (3)	0.73	0.0910996	-2.55	0.011
	once or twice a week (4)	0.50	0.0538332	-6.41	0.000
	or 4 times a week (5)	0.37	0.0540387	-6.81	0.000
	every or most days (6)	0.33	0.0637307	-5.74	0.000
<b>Is the father employed or unemployed?</b>	employed (1)	-	-	-	-
	unemployed (2)	1.52	0.1730719	3.65	0.000
<b>No. natural parents living with the 16 year old child?</b>	both natural parents (1)	-	-	-	-
	natural mother (2)	0.94	0.1089708	-0.57	0.571
	natural father (3)	0.81	0.2636919	-0.65	0.514
	neither natural parents (4)	0.65	0.1808481	-1.54	0.124
<b>Has the family been troubled by financial hardship in the</b>	yes (1)	0.89	0.1042564	-1.03	0.304
	no (2)	-	-	-	-
	uncertain (3)	0.53	0.1766452	-1.89	0.058
	don't know (4)	1.09	0.8175469	0.12	0.906

<b>past year?</b>	other reply (5)	1.39	0.6150601	0.74	0.457
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Parental smoking does not cause any important effect on children's drinking. A father smoking does not seem to have any significant correlation with the dependent variable. All the reported *p-values* are greater than 0,05; yet smoking cigars is significant at 10%. Regarding the mother's smoking habit, although the levels 2, 3 and 5 of the explanatory variable are insignificant, the child whose mother smokes cigarettes - compared to one whose mother never smoked is less likely to never drink alcohol (or more likely to drink alcohol). Moreover, as we can see from the results, parental drinking is strongly associated with adolescent drinking. The child whose father drinks alcohol every/most days - compared to one whose father drinks alcohol rarely/never – is 0.47 times less likely to never drink. The same logic is used for the remaining categories of the same explanatory variable. Mother's drinking is also statistically significant and it seems to influence children's drinking. Similarly, the child whose mother drinks alcohol every/most days - compared to one whose mother drinks alcohol rarely/never – is 0.33 times less likely to never drink. This concept is analogous for the remaining categories. As we can observe, children are also influenced by their father's employment status, yet in an unexpected way: If the father is unemployed, then the odds that adolescents will drink less or not drink at all are 1.52 times higher than if the father was employed. This might happen because the mother may be employed; thus children do not tend to turn to unhealthy habits. Financial problems of the family and the number of the natural parents of the child do not seem to affect children's drinking habits

## 7.Results: smoking habits

We will now try to address whether children’s smoking activities are influenced by parental habits, peer activities or other factors. Our dependent variable is “How many cigarettes do you smoke a week?” and it has four categories, “none”, “les than one”, “1-4” and “5-20”. The information for the dependent variable is presented in table 3.4. Table 3.5 shows the estimation of the variables after running an ordered logistic regression.

**Table 3.4** Dependent variable for children’s smoking habit

Number of obs = 2715		LR chi2(19) = 808.47		
Log likelihood = -1401.5622		Prob > chi2 = 0.0000		
<i>Dependent Variable</i>	<i>Categories</i>	<i>Level of Category</i>	<i>Frequency (%)</i>	
<b>How many cigarettes do you smoke a week?</b>	none	1	4,269 (78.33)	
	less than one	2	153 (2.81)	
	1-4	3	149 (2.73)	
	5-20	4	879 (16.13)	

**Table 3.5** Estimates from the ordered logit of adolescent smoking habits using odds ratios

<i>Explanatory Variables</i>	<i>Categories</i>	<i>Odds Ratios</i>	<i>Std. Error</i>	<i>z</i>	<i>p&gt; z </i>
<b>Does your husband smoke at all?</b>	yes, cigarettes (1)	1.62	0.2597193	3.00	0.003
	yes cigars pipes etc (2)	1.48	0.3064025	1.93	0.054
	not sure-prob smokes (3)	2.14	4.00e-07	0.00	1.000
	never smoked (4)	-	-	-	-
	no but ex-smoker (5)	1.30	0.1932706	1.76	0.079
<b>Do you (mother) smoke at all?</b>	yes, cigarettes (1)	1.69	1.04	3.58	0.000
	yes cigars pipes etc (2)	0.64	0.81	-0.46	0.644
	not sure-prob smokes (3)	5.11	1.43	-0.00	1.000
	never smoked (4)	-	-	-	-
	no but ex-smoker (5)	1.13	0.89	0.83	0.404
<b>Does your best friend smoke?</b>	not at all (1)	-	-	-	-
	sometimes (2)	6.96	1.113087	12.13	0.000
	often (3)	23.41	3.316774	22.26	0.000

	don't know (4)	2.48	0.825995	2.74	0.006
<b>How often does your husband consume alcoholic beverages?</b>	very rarely/never (1)	-	-	-	-
	once a month (2)	0.71	0.2137528	-1.14	0.256
	2 or 3 times a month (3)	1.06	0.2037611	0.23	0.815
	once or twice a week (4)	0.96	0.2467058	-0.15	0.878
	or 4 times a week (5)	1.03	0.2779522	0.13	0.900
	every or most days (6)	0.80	0.2261571	-0.78	0.435
<b>How often do you (mother) consume alcoholic beverages?</b>	very rarely/never (1)	-	-	-	-
	once a month (2)	1.10	0.2660808	0.41	0.681
	2 or 3 times a month (3)	1.58	0.3431059	2.14	0.032
	once or twice a week (4)	1.29	0.2314896	1.43	0.152
	or 4 times a week (5)	1.76	0.4142028	2.39	0.017
	every or most days (6)	2.20	0.6781508	2.56	0.011
<b>Is the father employed or unemployed?</b>	employed (1)	-	-	-	-
	unemployed (2)	1.15	0.2078195	0.79	0.429
<b>No. natural parents living with the 16 year old child</b>	both natural parents (1)	-	-	-	-
	natural mother (2)	1.27	0.2278227	1.34	0.180
	natural father (3)	1.22	0.5806947	0.42	0.673
	neither natural parents (4)	2.40	0.9835808	2.14	0.032
<b>Has the family been troubled by financial hardship in the past year</b>	yes (1)	1.19	0.2167884	0.95	0.342
	no (2)	-	-	-	-
	uncertain (3)	2.16	1.061213	1.56	0.119
	don't know (4)	0.32	0.4648936	-0.79	0.432
	other reply (5)	0.51	0.4439893	-0.77	0.442

As we can see from the results, parental smoking is strongly correlated with children's smoking. This means that if the father smokes cigarettes, the odds that the child will smoke more versus "none" are 1.62 times higher than if the father has never smoked. Similarly for the mother, if she smokes cigarettes, the odds that the child will smoke more versus "none" are 1.69 times higher than if the mother has never smoked. This shows that if both parents smoke their children are probably going to smoke. Friends seem to have a strong influence on adolescents. If the child's best friend smokes "sometimes", the odds that the child will smoke more versus "none" are 6.96 times greater than if the best friend did not smoke at all. The child whose best friend smokes "often" - compared to one whose best friend doesn't smoke - is 23.41 times more likely

to smoke. This shows that children are highly influenced by peers on that age and they try to mimic their actions. Father’s drinking doesn’t seem to affect children at all. Nevertheless, it seems that if the mother drinks “everyday/most days”, the odds that the child will smoke more versus “none”, are 2.20 times greater than if mother drunk very rarely or not at all. This means that children tend to smoke more if their mother drinks every day. Father’s employment status doesn’t seem to affect children’s smoking at all.

### 8 .Physical activity

The last question that we need to address is whether the children’s physical activity is influenced by parental physical activity or other factors. In order to do that, we need to run a logistic regression, considering as dependent variable “pm4.5” (“teenager does keep fit”), which is binary and has two responses, “yes” and “no”. Information for this variable is presented on table 3.6. The results of the estimated odds ratios of the logit model are displayed on table 3.7.

**Table 3.6** Dependent variable for children’s physical activity

<b>Number of obs = 1734</b>		<b>LR chi2(19) = 103.76</b>		
<b>Log likelihood = -992.37391</b>		<b>Prob &gt; chi2 = 0.0000</b>		
<i>Dependent Variable</i>	<i>Categories</i>	<i>Level of Category</i>	<i>Frequency (%)</i>	
<b>Teenager does keep fit exercises</b>	yes (0)	1	1,838 (27.81)	
	no (1)	2	4,771 (72.19)	

**Table 3.7** Estimates from the logistic regression of adolescent physical activity using odds ratios

<i>Explanatory Variables</i>	<i>Categories</i>	<i>Odds Ratios</i>	<i>Std. Error</i>	<i>z</i>	<i>p&gt; z </i>
<b>Does your husband smoke at all?</b>	yes, cigarettes (1)	1.36	0.2324746	1.80	0.072
	yes cigars pipes etc (2)	0.99	0.2049372	-0.04	0.966
	not sure-prob smokes (3)	1.09	1.433951	0.06	0.950
	never smoked (4)	-	-	-	-
	no but ex-smoker (5)	1.15	0.158884	1.01	0.315
<b>Do you (mother) smoke at all?</b>	yes, cigarettes (1)	0.78	0.1218509	-1.58	0.113
	yes cigars pipes etc (2)	0.46	0.368937	-0.97	0.334
	not sure-prob smokes (3)	-	-	-	-
	never smoked (4)	-	-	-	-

	no but ex-smoker (5)	0.91	0.128477	-0.70	0.483
<b>Does your best friend smoke?</b>	not at all (1)	-	-	-	-
	sometimes (2)	0.83	0.1279892	-1.19	0.234
	often (3)	1.11	0.1581099	0.78	0.433
	don't know (4)	1.54	0.533051	1.24	0.214
<b>How often you're your husband consume alcoholic beverages?</b>	very rarely/never (1)	-	-	-	-
	once a month (2)	1.86	0.5462747	2.11	0.034
	2 or 3 times a month (3)	1.19	0.3161986	0.66	0.508
	once or twice a week (4)	1.14	0.2487683	0.63	0.526
	or 4 times a week (5)	0.92	0.2314875	-0.31	0.759
	every or most days (6)	0.54	0.1580584	-2.09	0.036
<b>How often do you (mother) consume alcoholic beverages?</b>	very rarely/never (1)	-	-	-	-
	once a month (2)	0.73	0.1714261	-1.35	0.178
	2 or 3 times a month (3)	1.02	0.2222336	0.08	0.936
	once or twice a week (4)	1.31	0.2474218	1.42	0.155
	or 4 times a week (5)	1.69	0.4254887	2.07	0.038
	every or most days (6)	2.43	0.8075465	2.69	0.007
<b>Is the father employed or unemployed?</b>	employed (1)	-	-	-	-
	unemployed (2)	0.85	0.1841451	-0.74	0.456
<b>Does your husband keep fit by exercising?</b>	yes (1)	-	-	-	-
	no (2)	2.10	0.3610267	4.32	0.000
<b>Do you keep fit by exercising?</b>	yes (1)	-	-	-	-
	no (2)	2.14	0.2478114	6.62	0.000
<b>Has the family been troubled by financial hardship in the past year?</b>	yes (1)	1.18	0.2628377	0.75	0.450
	no (2)	-	-	-	-
	uncertain (3)	1.90	1.26376	0.98	0.328
	don't know (4)	-	-	-	-
	other reply (5)	1.25	0.8840538	0.32	0.749

As we can see from the results, parental and peer smoking does not affect children's exercise. Only if the child whose father smokes cigarettes - compared to one whose father does not - is more likely not to exercise (significant at 10%). Children do not seem to be influenced by their friends' smoking habits in order to be physically active or not. Nevertheless parental drinking influences children's physical activity. It seems that, the child whose father drinks alcohol

“every or most days”- compared to one whose father drinks very rarely or never- is 0.54 less likely not to exercise. Mother also affects children’s physical activity with her drinking. If the mother drinks alcohol “every or most days”, then the odds that the child does not exercise versus it does, are 2.43 times greater than if the mother drunk very rarely or never. Father’s employment status does not seem to significantly affect children’s physical activity. Parental physical activity is strongly correlated with children’s physical exercise. As we observe, the child whose father does not exercise - compared to one whose father does exercise – is 2.10 more likely not to exercise. Similarly for the mother, the child whose mother does not exercise - compared to one whose mother does exercise – is 2.14 more likely not to exercise. Family financial troubles don’t seem to play any significant role on children’s exercise.

### **Conclusion**

This study builds up on previous studies that have examined the factors that influence young adolescents on adopting healthy lifestyles. Many of these studies have found similar results, showing that parental habits such as alcohol use, smoking or physical exercise, as well as peer group habits such as cigarette smoking, exert great influence on adolescents’ lifestyle health activities.

According to our estimates, parental drinking is strongly correlated with adolescent drinking. If parents drink regularly, children are also more likely to drink<sup>13</sup>.

Our results show that, if the father or the mother is a heavy drinker, it is more likely for the children to drink more. It is also evident from our analysis that mother’s drinking habits have a greater effect on children than father’s drinking habits<sup>14</sup>. Father’s employment does not play a significant role on children’s drinking. As we can see from our results, children are more likely not to drink if their father is unemployed rather than if he is employed. This may happen because the mother is working and her healthy lifestyle is strong enough to compensate father’s influence on children. Financial hardship during the past year does not seem to affect children’s attitudes towards health-risk. This may be because if a financial hardship

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<sup>13</sup> This has also been shown by Barnes, Farrell & Cairnes (1986), who concluded that children follow the same drinking patterns as their parents

<sup>14</sup>This was also reported by Wickrama, Conger & Wallace (1999). Parental smoking habits do not seem to influence children’s drinking at all.

occurred, it might have lasted for a short period of time, not enough to influence children's psychology and urge them to start adopting risky health-related lifestyles. Maybe a variable on the household's income would have been more appropriate in observing the financial status of the family and drawing better conclusions on whether this factor can influence children's health lifestyles. We can also see that the number of natural parents does not affect at all the children's drinking habits. This means that it doesn't make any difference if the child has natural or step parents.

The results demonstrate that children's smoking is strongly correlated with parental smoking<sup>15</sup>. Although father's drinking does not seem to influence children, mother's excessive drinking is strongly correlated with children's smoking. This is because the mother is generally a more influential figure for 16 years olds than the father and her lifestyle influences children's lifestyle at several levels (Wickrama, Conger & Wallace (1999)).

The father's employment status does not affect children's smoking. This may occur because the mother may be working; therefore there is a balance in the family's socioeconomic status, mother constitutes a good role model for the children and, as a result, children do not tend to harm themselves by smoking<sup>16</sup>. In our model we did not use any variables on the educational level of the father or the mother; rather we used father's employment. Employment is not necessarily dependent on parents' education but it is a significant factor. Something that was not mentioned at the results and it is worth noticing is that if we do not take into account the rest of the factors in the regression (just run a logit model with only one explanatory variable: 'employment status'), father's employment is statistically significant and

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<sup>15</sup> This finding coincides with those of previous studies such as by Farkas et al. (1999) who suggested that parental smoking cessation influences children at ages 15-17 and discourages them to smoke. However, it contradicts with Chassin's conclusion that parental smoking is unrelated with children's smoking in high school (Chassin et al 1984). Nevertheless, peer groups exert a greater influence on children at that age. Our results show that if children's best friend smokes, the probability that they also smoke is much higher than if their parents smoke. This means that children's friends have much greater influence than parents regarding smoking which is reasonable as children tend to imitate each other at the age of adolescence

<sup>16</sup> This has also been shown by Wickrama et al. (1999) who concluded that family's social status (i.e. the overall education of mother and father) plays a significant role on the children's behaviors in smoking, exercise, excessive drinking and poor eating, more than the educational level of the mother or the father individually.

influences children's smoking. If the father is unemployed, the children are more likely to smoke and vice versa. The child whose father is unemployed - compared to one whose father is employed - is 1.31 more likely to smoke. The presence of any financial hardship does not play an important role also here, probably for the same reasons as before.

Physical activity is not correlated with parental or peer smoking. If the parents or the friends of the child smoke, there is no influence on the child's physical activity. However, parental drinking in high levels is strongly associated with children's physical activity. What is odd here is that the father influences the children reversely than the mother. It seems that if the father drinks every day, the child is less likely not to exercise (more likely to exercise). However, if the mother drinks every day, the child is more likely not to exercise. This is also shown by obtaining the marginal effects. We observe that if the father drinks every day, there is a negative effect on children's "not exercising" (positive effect on exercise) by 0.1332838 (or 13.3%) Nevertheless, if the mother drinks every day, there is a positive effect on children's "not exercising" (negative effect on exercise) by 0.1466585 (or 14.7%) (These results can be found in Appendix II).

Parental physical activity is highly associated with children's physical activity. If the father does not exercise, there is a positive effect on children's "not exercise" by 0.1658484 (or 16.6%). If the mother does not exercise, there is a positive effect on children's "not exercise" by 0.1620899 (or 16.2%). Therefore, if the father or the mother does not exercise, it is more likely for the child also not to be physically active. It seems that the influence parents exert on children is almost the same. These findings are in accordance with previous studies that show positive correlations between parental and children's physical activity (Moore et al (1991); Anderssen & Wold (1992)). However, other studies (Anderssen et al. (2006); McMurray et al. (1993); Trost et al. (2003)) have found minimal or no effects between parental physical activity and children's exercise.

A significant limitation to this estimation is that in order to evaluate how children's physical activity is influenced by several factors, we used a variable answered by the mother and not directly by the child. This may not capture activities that the children do and the mother is unaware of. Furthermore, there are also other factors that haven't been included in this analysis that may also have a great effect on children's unhealthy lifestyles i.e. media effect, teachers, other groups (sports teams etc.), parental education level, family income etc. The results may be even more accurate, by conducting further research. For example, further tests can be performed on STATA in order to check the odds proportionality with assumptions. If it

does not hold it would be wise to perform a “generalized ordered logic model” which does not assume proportional odds.

This study attempts to explore further the sources that influence children in adopting particular lifestyles. It adds an empirical example of evidence to the existing literature by using the models of logistic regression and ordered logistic regression. Our results have proved that children are highly influenced by parental habits as they consider them role-models and mimic their way of living. Parents are justifiably one of the main socializing agents of children, along with peers, as they both exert a great influence on children’s decisions to adopt healthy or unhealthy lifestyles.

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