Juvenile smoking and drinking behaviour in England: the role of the perceived neighbourhood quality

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Abstract

People choose very often according to what they learn from their reference group (Case and Katz, 1991; Crane, 1991; Gaviria and Raphael, 2001; Ichino and Maggi, 1999; Kremer and Levy, 2003). In particular, individuals who believe and respect social norms obtain reputation. Reputation, consideration, can be considered as "identity goods": individuals need reputation and consideration to make their own cultural and virtual capital stronger: in a word to strengthen identity (Akerlof and Kranton, 1999; Kandori, 1992; Elster, 1989; Akerlof, 1980). Reputation is, from an economic point of view, a surplus of utility that is higher than the cost implied by the respect of the norm. Social norms can be incorporated in goods: the consumption of these goods gives costumers social status, reputation, identity. These kind of norms are called *consumption norms* (Corneo and Jeanne, 1997).
Consumption norms can have their birth from an investment made by firms producing goods or services. Firms try, through market strategies and advertisings, to link the consumption of the goods they produce with the opportunity of obtaining social status, reputation, consideration.
Young people are, in particular, subject of these kind of market strategies because they, particularly, look for identity.
The hypothesis tested in this paper is that in areas where the quality of life has a low level no social norms are created so as to generate competition to consumption norms created by firms. In areas where the quality of neighbourhood is low young people are particularly subject to the consumption norms linked to those goods that generally offer identity: cigarettes and alcoholic drinks.
Using a British data set (Health Survey for England, 2002), the hypothesis is tested on the individual choice: youth's probability to smoke and drink is higher the lower the quality of neighbourhood is.
The index of the quality of neighbourhood used is made of two different components (components are extracted, through the factor analysis approach, from some questions asked to each youth's parents about the perceived situation of the local area they live in). A component represents the quality of social relations. This index represents social capital in terms of trust. The second component of the index represents phenomena of vandalism.
Among the personal characteristics used as independent variables in estimating the probability of assuming such behaviour, the score of the "Strengths and Difficulties Questionnaire" is a way to represent youths' conduct problems such as hyperactivity, emotional symptoms, peer problems, and prosocial behaviour (this questionnaire is usually used by psychologists to assess violent behaviour and related constructs in children and adolescents). Another important variable used as control is the social class the head of the family belongs to (using NS-SEC classification).
The component of the index of quality of life related to vandalism problems is not significant.
The component that represents the perceived social capital is significant for female and not for male and just for smoking, when the alternative is every other behaviour, and for drinking and smoking behaviour together when the alternative is neither smoke nor drink.

According to the data used, a high level of quality of life reduces the probability, for female, of bad behaviour such smoke and drink together but drinking is better than smoking. Smoking and drinking behaviour for male is particularly linked to personal rather than to collective reasons.

JEL Classification: I12, Z13.

Introduction

Non market interactions[1] has become a very relevant issue, during the last years , among economists, even if it is not a new issue in the economic literature[2]. The recent development about social interactions in the economic literature are focused on the enrichment of the traditional theory of the *homo oeconomicus*. The attempts at enrich the neoclassical choice model are guided by the will to improve the realism of behavioural assumptions on which the microeconomic theory is based. For this reason researchers admit the multidisciplinary nature of the decision theory and the economic analysis is enriched through sociological and psychological elements (Rabin, 1996, 2000). One of the most recent approaches through which economists face the social interactions issue is called "New Social Economics" (Durlauf, Young, 1999). Even if this "new research agenda" is still part of the methodological individualism and of the maximazing logic, the New Social Economics adds, among the independent variables of the utility functions, the affection of the reference group. The utility is composed of two (additive and separable) elements: the individual part (the traditional one) and the social part, representing the social affection.
The social part of the utility function is often justified by the presence of a social custom settling behaviours in a given group of people (Akerlof, 1980; Romer, 1984). The respect of this custom gives a utility surplus in terms of reputation.

From a theoretical point of view the economic literature is rich of interaction based models and improvements are very satisfying; the same does not happen with reference to the empirical analysis (Manski, 2000). Manski (2000) brings out several reasons why the empirical analysis of social interactions has not reached satisfying results yet. First of all, empirical works miss a punctual definition of what kind of social interaction the researcher wants to estimate: terms as "social capital", "peer influence", "neighbourhood effects" are often used as synonymous and a clear definition of what the variable used as a proxy for non market interactions represented, is not provided. Another problem is that social interactions are usually identified through the individual outcomes. Individual outcomes can be generated by several kind of interactions as well as by choice processes which are absolutely independent from any kind of interaction: unfortunately it is often difficult to understand the generation process of a choice starting from its outcome.

Another problem in the data analysis is the issue that Manski calls "*reflection problem*":
"Suppose that you observe the almost simultaneous movements of a man and his image in a mirror. Does the mirror image cause the man` s movements or reflect them? If you do not understand something of optics and human behaviour, you will not be able to tell[3]*."*

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[1] The definition of Social Interaction given by Luciano Gallino (1993) is the following: "A relation between two or more agents individual or collective, of short or long term, during which every agent modifies his/her behaviour with reference to the other's behaviour, both before or after this takes place, both anticipating and imagining – no matter if correctly – which could be the behaviour that the other agent will have following his/her own action" .

[2] The early marginalist authors used to consider the issue of social interactions (Menger (1871), Jevons (1879), Marshall (1890), Pigou (1903), Fisher (1926) e Pantaleoni (1898)), but it was in particular Becker (1974) who considered social interactions, especially in households.

[3] Charles F. Manski, Identification problems in the social sciences, Harvard University Press Cambridge, Massachusetts, London, England 1995.

The problem stressed by Manski in the previous sentence appears every time the researcher tries to explain the behaviour of a single person in a group. Is the choice made by the individual consequence of an endogenous effect or of a simple correlation?
In the former case the choice of the individual depends on the prevailing choice made in his reference group, or on the choice made by someone in the group; in the latter case individuals belonging to the same group behave in the same way because they are affected by the same environment (correlated effect)[4].

Manski (2000) stresses a third type of social interactions, defined contextual, in which the probability of an individual to behave in a particular way changes with the exogenous characteristics of the group members. While endogenous and contextual effect are social phenomena, the correlated effect has nothing to do with non market interactions.

An example of such issues is represented by some works in which juvenile phenomena are analysed (smoking, drinking, tattooing, having a personal mobile, etc) considering classes as reference group (Gaviria, Raphael, 2000). The fact that in a class several boys and girls have the same behaviour could be caused by reciprocal affection or by the fact that boys and girls are of the same age, have the same personal characteristics and it is normal that they behave the same without affecting each other; or it is possible they do not affect each other but they are all affected by same environment.

In this paper analyzed behaviours are cigarette smoking and alcohol drinking by youths in England. In several papers researchers have analysed the consequences of smoking, drinking and doping behaviours on the labour market (Van Ours, 2003, 2004, 2005; MacDonald, Pudney, 2000, 2001).
In the present paper the role of social interactions on the choice of assuming such behaviours is analysed. Social interactions are measured through an index representing the quality of the neighbourhoods in which youths live: the kind of interactions identified is the contextual effect.

The hypothesis tested is that the less the neighbourhood quality the less the probability that a social custom that forbidening such behaviours is produced in the social environment in which youths live. If no norms are created then, it is not possible to win the competition against norms created by firms producing cigarettes and alcoholic drinks, linked to the consumption of these goods: in this case firms producing cigarettes and alcoholic drinks create consumption norms in a monopoly regime.

Cigarettes, alcohol and *consumption norms*

This paper is focused on consumption norms, that is on reputational characteristic linked to the consumption of a given good: the consumption of a good, according to the "social status characteristic" that are linked to it provide a level of reputation that compensate the price of the good. Corneo and Jeanne (1996) starting from Akerlof (1980) and Leibenstein (1950) analyse situations in which consumptions norms give rise to "bandwagon and snob effects", taking into account a fundamental element which has never been considered before: the birth

[4] Glaeser et al. (1995) stresses how environmental characteristics, the characteristics of cities in particular, determine inhabitants propensity to assume a particular behaviour, because the characteristics of a city reflect its own inhabitants characteristics: an agent living in a city with several good schools will easily have a high education level and a high education level could reduce propensity to crime, increasing the cost to be criminals.

of the social norm. Corneo and Jeanne (1996) analyse the idea that social norms can be created by agents and institutions though a sort of investment in social norms. this investment requires a cost but then, it allows to have high profits. Social norms can be created through market strategies able to link the consumption of the good to reputation.

Corneo and Jeanne (1996) gave some examples of market strategies through which goods are offered at a low price to a given subset of the population so as to create a network of consumers buying the good to acquire a social status that the good, step by step, becomes able to provide: people consuming that good acquire reputation, people not consuming that good do not acquire reputation. In Corneo and Jeanne (1996) the choice of which norm to respect is not evaluated.

This paper considers as goods with reputational characteristics, cigarettes and alcohol and as consumers English youths. The utility surplus in terms of reputation coming from the consumption of cigarettes and alcoholic drinks depends on the birth of a norm imposed through market strategies which have a probability to catch on that is higher the lower the neighbourhood quality is.

The neighbourhood quality affects different aspects of health: mental and physical health are not only consequence of individual characteristics but often depends on the social environment in which people live. Behaviours as tobacco smoking depend on the social participation and on the social capital present where people live. It has been stressed (Lindström, Isacsson, Elmståhl, 2003) how social participation and social capital are important with reference to stopping behaviours having bad consequences on physical health, like cigarette smoking, since they can promote a quick diffusion of health information and executing social control on deviate behaviours linked to health.

On the ground of the verified social component linked to choice of drink and smoke, the hypothesis this paper intend to empirically verify is that the less the neighbourhood quality the less the competition among social norms; in this sense the investment in social norms made by firms producing cigarettes and alcoholic drinks could be successful.

A high level neighbourhood quality could guarantee the production of social norms able to compete against norms linked to consumption of cigarettes and alcoholic drinks.
The choice of firm to invest in consumption norms depends on the power market of the firm. If no other firms or institutions able to produce goods which are perfect substitute, with reputational characteristics, to compete with the good “cigarette” or “pint of beer”, then the firm producing the reputational good act in monopoly regime: this is the situation that happens in areas where the neighbourhood quality is low. Competition does not refer to the good produced but to the norm linked to the good: the social environment does not produce cigarettes or alcohol but social norms competing with the consumption norm linked to the cigarette or to alcoholic drinks.
Cigarettes and alcohol provide youths with a social status, since they allow to affirm their own identity. By the way, the identity expressed as sense of oneself has already been considered in the economic analysis by Akerlof and Kranton (1999).

These attempts to modify norms or, using Corneo and Jeanne (1996) language, to impose a social norm as it was an investment, have strong results on youths and, in particular, using the previous hypothesis, on youths living in low level neighbourhood quality, in areas in which no other goods are created so as to helping them in finding their identity. Youths are particularly sensitive to the affection of the environment because they look for their identity out of their household. (Peeples e Loeber, 1994; Ennett, Wilson, Huizinga, Sampson e Rankin, 1997).

The fact that firms producing alcoholic drinks consider youths as important set of consumers is proved by the recent introduction in markets of alcopops (soft alcoholic drinks) addressed to this target group.
It is necessary to stress that this paper do not analyse situations of alcohol and cigarettes dependence but just situations in which, sometimes, or even just once for the youngest, youths smoke a cigarette or drink a pint of beer. The case of dependence, alcohol dependence in particular, would not be a situation of consumption norm and identity goods presence, but a phenomenon strictly linked to situations of deep uneasiness.

The kind of social interactions identified in this paper are contextual effects. Referring to Manski (1995, 2000) once again, contextual interactions in this paper mean youths' propensity to smoke and/or drink, linking these behaviour to the characteristics of the social environment, which is meant, in particular, in terms of quality of social relations

In this paper youths do not choose according to the observation of the outcomes of choices made in their own reference group (it is not possible to identify a distance function among individuals and then a reference group in the data set used) but according to the affection received by their neighbours.

The Data Set used

Health Survey for England 2002 is the cross section number 12 of a series of surveys having the aim to monitor health trends in England. This survey has been commissioned by the Department of Health and edited by the Joint Health Surveys Unit of the National Centre for Social Research and by the Department of Epidemiology and Public Health of the University College Medical School. Observations regards about 18400 individuals living in England. HSE 2002 regards in particular health of particular sets of the population, including: infants and children (aged from 0 to 15), young adults (16-24 years old) and mothers with infants.

Neighbourhood quality

Like Evans, Oates and Schwab (1991) and Crane (1991) neighbourhood effects are evaluated on the ground of the social characteristics of the local are in which youths live. The idea is that the better the neighbourhood quality the less the probability that youths smoke and drink. The information contained in the data set allows to represent the neighbourhood quality according to two dimensions. The first dimension is an indicator of the perceived quality of relations, in terms of trust, reciprocal help and fairness, in the local neighbourhood.
The difference between the present work and the ones previously mentioned regards two aspects: the former regards the technique used to obtain the variables representing the neighbourhood quality; the latter regards the fact that the neighbourhood quality is evaluated according to a subjective measure, perceived by youths' parents.
With concern to the technique used, the two variables are obtained by a factor analysis made among several dummy variables got by the same questions asked to individuals aged more than sixteen. In particular, the questions asked are the following:

This area is a place where neighbours look after each other

NEIGBR

In your local area how much of a problem are teenagers hanging around on the streets?

TEENS1

In your local area how much of a problem is vandalism, graffiti or deliberate damage to property?

VANDALS1

Generally speaking, would you say that most people can be trusted or you can't be too careful in dealing with people?

TRUSTED

Would you say that most of the time people try to be helpful or just look out for themselves?

HELPFUL

Do you think most people would take advantage of you if they got the chance or would they try to be fair?

ADVNTG

The innovative aspect of the use of these variables is that they do not represent an objective measure of the neighbourhood quality but a subjective one. Instead of using, as Crane (1991) did, the percentage of people with qualified duties and instead of using, as Evans, Oates and Schwab (1991) did, the percentage of poor people, in the present work neighbourhood quality is obtained by the perceived measure people have of this quality.

An index based on the perceived neighbourhood quality using the same tool used in this work is presented by M-J Yang, M-S Yang, C-H Shih, I Kawachi (2002) in the *Journal of Epidemiology Community Health*. This article, like many other articles published on JECH, show the link between physical and mental health and the neighbourhood quality.

Youths have not been directly asked about neighbourhood quality; variables representing neighbourhood quality have been extracted by what has been answered by members of the family, following this order: mother, father, someone else living in the same house aged more than sixteen.

Table 1: principal component factors; 2 factors retained

Factor	Eigenvalue	Difference	Proportion	Cumulative
1	2.27959	0.9948	0.3799	0.3799
2	1.2848	0.42833	0.2141	0.5941
3	0.85647	0.19953	0.1427	0.7368
4	0.65693	0.10191	0.1095	0.8463
5	0.55502	0.18783	0.0925	0.9388
6	0.36719	.	0.0612	1

The method used to extract factors is the principal components one.
The percentage of cumulative variance shows the necessity to keep at least two factors so as to loosing a low level of information caused by the reduction of dimensions. Using the first two factors the 60% of the total variance is explained.

Table 2: Factor Loadings

Variable	1	2	Uniqueness
helpful	0.67824	0.41199	0.37025
trusted	0.60419	0.3471	0.51448
advntg	0.6413	0.36046	0.45881
neigbrs	0.49235	0.19079	0.72119
teens1	0.63904	-0.63557	0.18768
vandals1	0.6265	-0.65138	0.18321

The previous table shows the Factor Loadings. It is difficult to interpret the two factors extracted. While it is clear that the second factor cannot represent the last two variables, the interpretation of the first factor is quite difficult.
To improve the interpretation of the two factors extracted an orthogonal varimax rotation is necessary[5].

[5] The aim of an orthogonal rotation of Factor Loadings is to obtain a structure in which factor loadings are associated in disjoint groups of variables. The aim of rotation is to get near as much as possible to an ideal structure of the matrix of factor loading of this kind:

$$\begin{bmatrix} 0 & 1 \\ 0 & 1 \\ 0 & 1 \\ 1 & 0 \\ 1 & 0 \end{bmatrix}$$

Table 3: Varimax Rotation

Variable	Rotated Factor Loadings 1	2	Uniqueness
helpful	0.10345	0.7868	0.37025
trusted	0.10768	0.68843	0.51448
advntg	0.1205	0.72572	0.45881
neigbrs	0.15952	0.50335	0.72119
teens1	0.89569	0.10029	0.18768
vandals1	0.90016	0.08062	0.18321

The previous table shows Factor Loadings after the Varimax Rotation. The rotated Factor Loadings matrix is much more closer to the ideal structure compared to the non rotated Factor Loadings matrix.
The two factors extracted can be interpreted in this way:

- the first factor offers a measure of neighbourhood quality in terms of vandalism phenomena, youth vandalism in particular. It represents a measure of the perceived safety in the local area.
- the second factor expresses a proxy for the quality of social relations in terms of trust and fairness. The variable extracted by this second factor can be considered as a subjective judgment on social capital in the area in which youths live, according to the definition given by Fukuyama (1996). Fukuyama (1996) define social capital as a collective resource having its birth from the degree of trust in a society or in part of it and "trust is the expectation, in a community, of a foreseeable behaviour, fair and cooperative, based on shared norms". An index for social capital is people propensity to trust each other out of the family: on the ground of this definition this paper considers the second factor as a proxy for social capital.

Scores calculated on factors previously extracted allow to have two new variables to be inserted in the analysis of the phenomena evaluated in this paper.

Table 4: Scoring Coefficients (based on rotated factors)

Variable	1	2
helpful	-0.06373	0.43277
trusted	-0.04469	0.37582
advntg	-0.0426	0.39502
neigbrs	0.01945	0.26138
teens1	0.56124	-0.09118
vandals1	0.56739	-0.10317

The two new variables obtained through the factor analysis represent a personal judgement on the neighbourhood quality level. Using these variables it is possible to represent both the characteristic of the common environment in which youths operate their choices and the characteristics of people by which youths are affected, expressing a judgment about the level of trust people have each other. This is why social interactions represented are contextual interactions (Manski, 1995, 2000).

Youths' smoking behaviour

Table 5: frequency of smoking behaviour according to the age

frequency and amount	age last birthday								
smoked (8-15s	8	9	10	11	12	13	14	15	Total
i have never smoked	448	450	455	477	411	397	331	230	3,199
	97.60	94.94	94.01	90.86	83.88	78.77	67.83	48.52	82.07
i have only smoked once or twice	10	18	22	37	58	67	93	112	417
	2.18	3.80	4.55	7.05	11.84	13.29	19.06	23.63	10.70
i used to smoke sometimes	0	4	7	9	15	21	32	35	123
	0.00	0.84	1.45	1.71	3.06	4.17	6.56	7.38	3.16
i sometimes smoke	1	2	0	1	3	8	7	28	50
	0.22	0.42	0.00	0.19	0.61	1.59	1.43	5.91	1.28
i smoke between one and six cigarettes	0	0	0	1	1	3	7	13	25
	0.00	0.00	0.00	0.19	0.20	0.60	1.43	2.74	0.64
i smoke more than six cigarettes every week	0	0	0	0	2	8	18	56	84
	0.00	0.00	0.00	0.00	0.41	1.59	3.69	11.81	2.15
Total	459	474	484	525	490	504	488	474	3,898
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The previous table shows how youths in the sample behave with reference to cigarettes smoking. More than 80% of the sample declares not having smoked ever; the remaining 20% declares to have smoked at least once. The intensity of the phenomenon increases according to the age. The choice to smoke could be, of course, linked to different causes with reference to the age. Children could try to smoke while "playing"; teenagers could decide to try to smoke to define their own identity out of the family.

The analysis of youths' smoke behaviour is estimated through a probit model in which the dependent variable is obtained by the question : "*whether ever smoked cigarettes"*.

Variables used as controls are the following:

someone_smokes: it is a dummy variable assuming the value 1 if someone smokes in the household; 0 otherwise. Evaluating if someone smokes in the household, this order has been followed: mother, father, anyone else living in the same flat as the youth live.

age: it is a variable assuming integer values in the 8-15 interval.

ethnici: it is a dummy variable assuming the value 1 in the case of white race (0 otherwise).

Sdq .SDQ (*Strenght and Difficulties Questionaire*) is a brief behavioural screening on youths between 4 and 16 years old. The version of questionnaire used in the data set is filled by children's parents.
The questionnaire is composed by five parts of questions (the questionnaire is in appendix). The five parts regard questions on emotional symptoms, conduct problems, hyperactivity/inattention, peer relationship problems and prosocial behaviour.

Sdq_totg is a psychometric variable resuming the five aspects analysed through the questionnaire and assume three different modalities according to the score obtained in the questionnaire. A score between 0 and 13 means a normal situation; a score between 14 and 16 means borderline situation; a score between 17 and 40 means an abnormal situation. This variable is ordinal and it has been transformed in 3 dummy variables. Sdq_totg1, the reference case, is linked to normal cases; sdq_totg2 is linked to borderline cases and sdq_totg3 refers to abnormal cases. Controlling for this variable is important because it represents a very precise and already tested index of youths' personal characteristics. What is expected is that when the index signals abnormal situations, then the probability of smoking and drinking increases, because of a higher sensibility to market strategies and to consumption norms.

hpnssec5: Most of the papers regarding the effect of social interactions on youths' behaviours use among control variables the household background, starting from the idea that some kind of behaviours can have a higher probability to happen according to the social and economic condition in which youths grow. Gaviria and Raphael (2001) use as proxy for the household background the parents' education level, the household income, the head's job; Case and Katz (1991) use the number of years of education; Powell, Tauras, Ross (2003) use as controls the parents' education level; Evans, Wallas, Schwab (1992) include among controls the mother's education level and a dummy representing her possible school drop up.
What is always used are several variables representing, the household head's social class.
It could be useful using just one variable that could represent the household head's social class according to strong theoretical ground.
The relation between youths' behaviour and the socio-economic household condition is not clear. The relation between alcohol consumption and economic household situation, for instance, seems positive in some countries (youths' living in better household economic condition drink more alcohol) and negative in other countries (World Health Organization, 2001). With reference to smoking, some analysis stressed that this behaviour is strongly linked to low level socioeconomic status (World Health Organization, 1997; Jarvis MJ, 1994). This is why using a socio-economic classification based on strong theoretical grounds can lead to robust results.

Operational categories		Analytic class variables			
		Nine categories	Eight categories	Five categories	Three categories
L1	Employers in Large Establishments	1.1 Large employers and higher managerial occupations	1 Higher managerial and professional occupations	1 Managerial and professional occupations	1 Managerial and professional occupations
L2	Higher Managerial Occupations				
L3	Higher Professional Occupations	1.2 Higher professional occupations			
L4	Lower Professional and Higher Technical Occupations	2 Lower managerial and professional occupations	2 Lower managerial and professional occupations		
L5	Lower Managerial Occupations				
L6	Higher Supervisory Occupations				
L7	Intermediate Occupations	3 Intermediate occupations	3 Intermediate occupations	2 Intermediate occupations	2 ***Intermediate occupations***
L8	Employers in Small Establishments	4 Small employers and own account workers	4 Small employers and own account workers	3 Small employers and own account workers	
L9	**Own Account Workers**				
L10	Lower Supervisory Occupations	5 Lower supervisory and technical occupations	5 Lower supervisory and technical occupations	4 Lower supervisory and technical occupations	3 Lower occupations
L11	**Lower Technical Occupations**				
L12	Semi-routine Occupations	*6 Semi-routine occupations*	*6 Semi-routine occupations*	*5 Semi-routine and routine occupations*	
L13	Routine Occupations	7 Routine occupations	7 Routine occupations		
L14	Never Worked and Long-term Unemployed	8 Never worked and long-term unemployed	8 Never worked and long-term unemployed	Never worked and long-term unemployed	Never worked and long-term unemployed

Figure 1: NS-SEC Operational Categories and their Relation to the Analytic Class Variables (Fonte: Pevalin, Rose, 2001).

The categories of the variable hpnssec5 are the following (they correspond to the categories of the Five categories in the previous table):

1 managerial and professional occupations
2 intermediate occupations
3 small employers and own account workers
4 lower supervisory and technical occupations
5 semi-routine occupations
99 other

The variable hpnnesc5 has been transformed in six dummy variables, the first dummy (managerial and professional occupations) is the reference one.

f2_fam: it is the variable created on the ground of the second factor of the factor analysis.

F1_fam: it is the variable created on the ground of the first factor of the factor analysis. This variable will not ever been significant, in any regression.

To take into consideration the fact that people with particular personal characteristics could be more sensitive to neighbourhood affection (Ellen, Turner, 1997), an interaction between two variables has been considered among controls. In particular it is possible that male and female have different sensibility to neighbourhood affection. An interaction term between the variable sex and the variable f2_fam has been considered among controls.

Results of smoking behaviour estimation

A probit model is estimated: the dependent variable is a dummy assuming the value 1 if youths smoked at least once and 0 otherwise. Control variables are the ones explained in the previous paragraph. The results are shown in the following table.

Table 6: output *smoking behaviour* probit estimation

Probit estimate	I smoke=1 I don't smoke=0
Someone smokes at home	0.30 (0.11)**
Sex (male)	-0.07612 (0.10200)
sexf2	**0.24** **(0.10)***
age last birthday	0.33 (0.03)**
ethnic groups (white)	0.79 (0.18)**
hpnssec5 Social Class (ref. managerial and professional occupations)	
intermediate occupations	-0.02 (0.20)
small employers and own account workers	0.12 (0.20)
lower supervisory and technical occupations	-0.08 (0.17)
semi-routine occupations	0.29 (0.13)*
Other occupations	0.37 (0.29)
Sdq questionnaire (ref. normality)	
sdq_totg==2 (borderline)	0.49 (0.17)**
sdq_totg==3 (abnormality)	0.75 (0.16)**
f2_fam	**-0.24** **(0.07)****
Constant	-6.02 (0.41)**
Observations	1176
Robust standard errors in parentheses	
* significant at 5%; ** significant at 1%	

Results of the probit model estimation show the variable **someone_smokes** is significant and with positive sign: if someone smokes in the household the probability that the youth behaves the same way increases. This result is concordant with several works focused on the same issue: Nakayama (2004) estimates youths' probability to smoke finding out a significant and positive relation with the fact that someone else at home behaves in the same way.

Several papers focused on the estimation of youths' choice models show the fact that when parents' behave in the same way, youths' probability to make the same choice increases. Evans and al. (1991) showed a significant and positive effect on youths' school drop out probability when youths' mother behaved the same way.
The fact that this variable is significant is a prove of the presence of social interactions in the household, stressing youths' choice dependence on family's choice. When someone smokes at home, then the fact that the youth could do the same is, in a sense, justified. The fact that someone smokes at home increases the power of consumption norm imposed by firms.

The variable **age** is significant, confirming how smoking probability increases for older youths.

The variable **ethnici** stresses how smoking probability increases when the youths has white race.

The only category of the variable **hpnssec5** that is significant and with positive sign is the one corresponding to social class "semi-routine occupations". This means that, with reference to the situation in which the household head has a managerial or professional occupation (reference class) the fact the household head belongs to the social class semi-routine occupations increases youths' probability to smoke.

The variable f2_fam is significant and has negative sign. This means that a high quality of interpersonal relations, in terms of trust, fairness, decreases the probability that youths try to smoke. The fact this variable is significant and has the sing it was supposed to have proves the initial hypothesis: the presence of good social relations is important for the production of normal norms acting in competition against consumption norms produced by firms. This variable is suitable to represent what Manski calls contextual effect and Glaeser et al. (1999) define propensity to undertake an action. This variable does not represent any endogenous interactions, but it simply stresses which are the characteristic of the social context in which the choice is undertaken. Since an interaction term between the variable f2_fam and the variable sex has been used as control in the probit regression, the variable f2_fam refers only to females.

With reference to the variable **sdq,** the coefficients of the two categories estimated are significant compared with the reference category. Both borderline and abnormality cases are significant and with positive sign. The interpretation is the following: as regards to having a score in the sdq questionnaire that represents a normality situation (reference modality) being in borderline or abnormality situation increases the probability to smoke.

The interaction variable **sexf2** is significant and has positive sign. The total effect for male is given by the sum of the parameters of the variable f2_fam and of the parameters of the variable sexf2 (this sum is zero). To stress the meaning of this interaction variable, a probit estimation has been executed separately for male and female. The results are presented in two following tables.

Table 7: output probit male *smoking behaviour* estimation

Male	I smoke=1 I don't smoke=0
Someone smokes at home	0.34 (0.15)*
age last birthday	0.26014 (0.03578)**
ethnic groups (white)	1.15 (0.32)**
hpnssec5 Social Class (ref: managerial and professional occupations)	
Intermediate occupations	-0.44 (0.30)
small employers and own account workers	0.24 (0.28)
lower supervisory and technical occupations	-0.03 (0.23)
semi-routine occupations	0.24 (0.17)
Other occupations	0.40 (0.38)
Sdq questionnaire (ref. normality)	
sdq_totg==2 (borderline)	0.62 (0.22)**
sdq_totg==3 (abnormality)	0.70 (0.20)**
f2_fam	**0.00** **(0.07)**
Constant	-5.52 (0.58)**
Observations	570
Robust standard errors in parentheses	
* significant at 5%; ** significant at 1%	

Table 8: output probit female *smoking behaviour* estimation

Female	I smoke=1 I don't smoke=0
Someone smokes at home	0.26 (0.15)
age last birthday	0.41615 (0.04359)**
ethnic groups (white)	0.63 (0.23)**
hpnssec5 Social Class (ref: managerial and professional occupations)	
intermediate occupations	0.20 (0.26)
small employers and own account workers	0.05 (0.26)
lower supervisory and technical occupations	-0.07 (0.25)
semi-routine occupations	0.37 (0.18)*
Other occupations	0.17 (0.44)
Sdq questionnaire (ref. normality)	
sdq_totg==2 (borderline)	0.26 (0.26)
sdq_totg==3 (abnormality)	0.80 (0.24)**
f2_fam	**-0.26** **(0.07)****
Constant	-6.95 (0.64)**
Observations	606
Robust standard errors in parentheses	
* significant at 5%; ** significant at 1%	

The separate estimation of the model for male and female stresses how the effect of social relation quality is not significant for males.
It is for female only that the presence of a high quality level in social relations, in social capital as it has already been stressed, decreases smoking probability. It is possible to affirm that, for females, high quality social relations are in a position to produce a social norm able to compare with consumption norms imposed, though market strategies, by firms producing cigarettes.

Youths' drinking behaviour

The report written on the occasion of the "World Health Organization European Ministerial Conference on Young People and Alcohol" which was held in Stocholm (19-21 February 2001) stresses how Europe is the continent with the higher alcohol consumption. Alcohol consumption among teenagers has reached alarming levels, even among girls, and youths start drinking alcoholic drinks when they are really very young. This consideration justifies the fact that the sample used in this work is aged between eight and fifteen.

The same hypothesis put forward as regards smoking behaviour are tested as regard drinking behaviour; variables used as controls are the same (except someone_smokes).
The question used as dependent variable is the following:

Have you ever had a proper alcoholic drink – a whole drink, not just a sip?

Table9: drinking behaviour according to age

age last birthday	ever had proper alcoholic drink yes	no	Total
8	38	431	469
	2.78	16.77	11.91
9	55	427	482
	4.02	16.61	12.24
10	86	405	491
	6.28	15.76	12.47
11	119	410	529
	8.69	15.95	13.43
12	154	340	494
	11.25	13.23	12.54
13	240	265	505
	17.53	10.31	12.82
14	303	190	493
	22.13	7.39	12.52
15	374	102	476
	27.32	3.97	12.08
Total	1,369	2,570	3,939
	100.00	100.00	100

Table 10 shows how having replied in affirmative way to the previous question increases substantially passing from children aged 8 to youth aged 19 (from 3% to 27%).

Figure 1: units of alcohol drunk during the last week (for youth with age between 13 and 15).

Figure 3 shows that, relative to youths between 13 and 15, the sample refers to the consumption of small quantities of alcohol.

Table 10: frequency of drinking behaviour according to the age

how often alcoholic drink	age last birthday								Total
	8	9	10	11	12	13	14	15	
almost every day	0	0	0	0	1	1	0	4	6
	0.00	0.00	0.00	0.00	0.45	0.32	0.00	0.96	0.36
about twice a week	0	0	0	4	1	5	15	41	66
	0.00	0.00	0.00	2.53	0.45	1.61	4.23	9.88	3.97
about once a week	2	4	5	11	6	16	35	68	147
	5.00	6.25	5.21	6.96	2.68	5.14	9.86	16.39	8.84
about once a fortnigh	1	2	7	9	11	25	36	65	156
	2.50	3.13	7.29	5.70	4.91	8.04	10.14	15.66	9.38
about once a month	2	4	11	14	24	48	54	70	227
	5.00	6.25	11.46	8.86	10.71	15.43	15.21	16.87	13.65
only a few times a ye	19	42	51	110	156	190	196	158	922
	47.50	65.63	53.13	69.62	69.64	61.09	55.21	38.07	55.44
i never drink alcohol	16	12	22	10	25	26	19	9	139
	40.00	18.75	22.92	6.33	11.16	8.36	5.35	2.17	8.36
Total	40	64	96	158	224	311	355	415	1,663
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

The previous table shows the frequency of alcohol consumption according to the age. In this case frequency increases with age, too. It is interesting to see how the percentage of youths aged 15 drinking once or twice a week represents almost the 30% of the total of youths aged 15 in the sample. It is possible that when this frequency is concentrated during the week end: this is consistent with another survey made in England in the same year "*Smoking, drinking & Drug use among young people in England 2002*" in which people, between 11 and 15 years old, are asked in which days of the week they consume alcoholic drinks. The days with the highest frequency are Friday and Saturday. In this sense the socialization importance of alcoholic drinks is evident.
It is amazing how a 5% of 8 years old children drinks once a week. The same frequency for 9 years old children regards more than 6%.

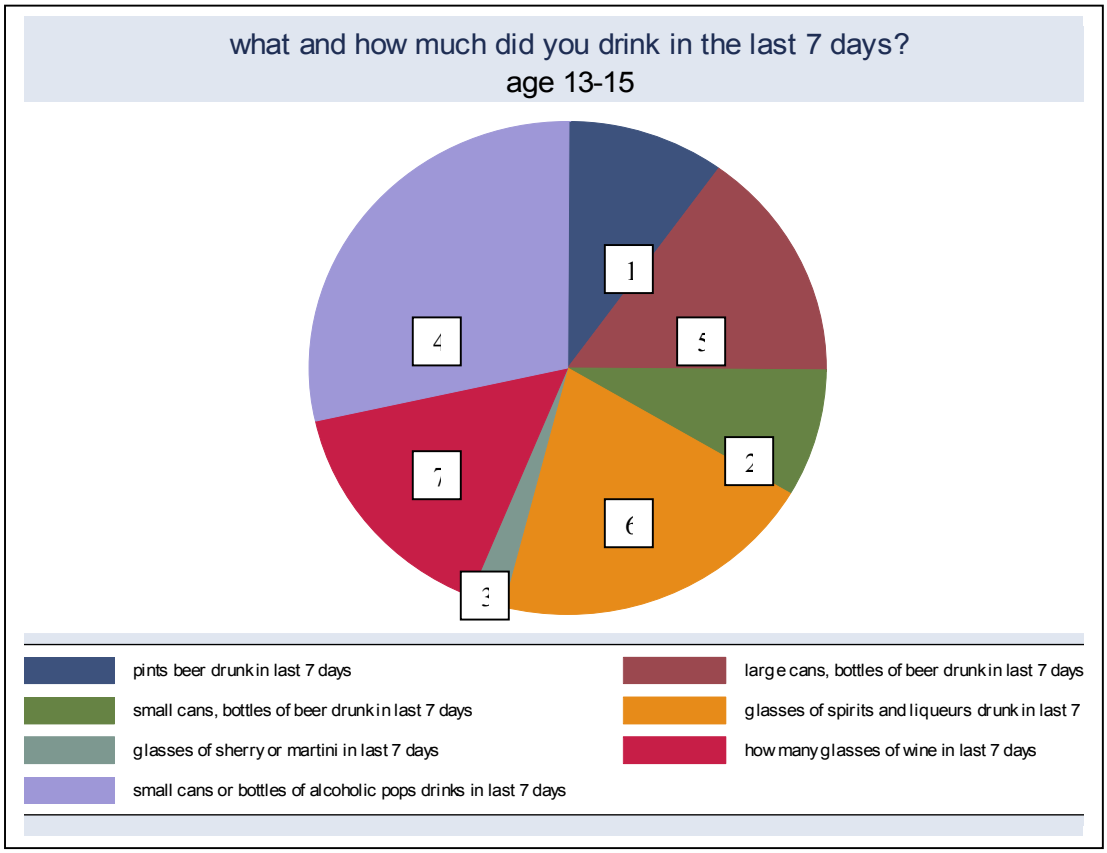

Figure 2: what and how did you drink last week?

Figure 4 shows what youths between 13 and 15 drink. The alcoholic drink more consumed is a light one (pops drinks); but heavy alcoholic drinks (spirits) are consumed, too.

Results of smoking behaviour estimation

Results of the probit model relative to the probability of drinking show how this behaviour is different from the smoking one.

Table 11: output probit drinking behaviour estimation

	ever had proper alcoholic drink
Sex (male)	0.23 (0.09)**
sexf2	0.15777 (0.08732)
age last birthday	0.34 (0.02)**
ethnic groups (white)	1.13 (0.20)**
hpnssec5 Social Class (ref: managerial and professional occupations)	
intermediate occupations	-0.06 (0.21)
small employers and own account workers	0.11 (0.15)
lower supervisory and technical occupations	-0.19 (0.14)
semi-routine occupations	0.06 (0.11)
Other occupations	-0.65 (0.48)
Sdq questionnaire (ref: normality)	
sdq_totg==2 (borderline)	0.31 (0.15)*
sdq_totg==3 (abnormality)	0.19 (0.16)
f2_fam	-0.09 (0.06)
Constant	-5.59 (0.37)**
Observations	1190
Robust standard errors in parentheses	
* significant at 5%; ** significant at 1%	

The only variables significant are sex, age, ethnici and sdq_totg_2, all of them with positive sign. It is not significant the most important variable in this work, f2_fam and the interaction between the same variable and sex is not significant, too.

Drinking probability is not linked to social environment characteristics in terms of social relations and of social capital. This does not mean that drinking choice is not linked to any kind of social interactions. Several works show how social interactions are important in affecting youths' drinking choice. Gaviria and Raphael (2001) show a positive effect of schoolmates' choice on youths' drinking choice; Kremer and Levy (2003) show significant

affections among roommates at the college. What these papers identify is an endogenous effect and not a contextual effect.

Smoking and Drinking together

The two behaviours of smoking and drinking have a positive correlation[6]:

```
. corr adrprop child_smokebis
(obs=3872)

             |  adrprop child_~s
-------------+------------------
     adrprop |   1.0000
child_smok~s |   0.3963   1.0000
```

The two behaviours, singularly considered, have different explanations and, as it has already been stressed, while smoking choice, for females, has a good explanation, in the negative sense, in the presence of social capital, the same does not happen about drinking choice.
Table 13 shows the output of the estimation of a multinomial logit[7] model, in which both smoking and drinking behaviour are taken into account[8].

Through the multinomial logit estimation of parameters, the three bad behaviours (smoking, drinking and smoking and drinking), are singularly compared to the good behaviour of neither smoke nor drink. This implies a big difference with reference to probit models previously estimated. Analysing singularly the smoking behaviour, the alternative choice is composed by the behaviour of neither smoke nor drink, drink, both smoking and drinking. The same happens with reference to drinking probit estimation: the alternative choice is composed by behaviours of neither drink nor smoke, smoke and both smoke and drink.
With the multinomial logit, taking the behaviour of neither smoke nor drink as reference, this behaviour is the alternative to the other thee bad behaviours. The dependent variable has 4 possible outcomes:

0=neither smoke nor drink; 1=to smoke; 2=to drink; 3=to smoke and to drink. The first one (0) is the outcome taken as reference. The multinomial logit dependent variable has the following frequencies:

---

[6] Questo dato è in linea con la survey "Smoking, drinking & Drug use among young people in England 2002" nella quale il coefficiente di correlazione tra i due comportamenti è 0.44

[7] [7] Il logit multinomiale è un modello multi - equazionale in cui k-1 equazioni sono stimate simultaneamente. Ogni equazione corrisponde ad una delle modalità stimate. Ognuna delle k-1 equazioni è una regressione logistica. La k-1esima equazione è quella di riferimento.

[8] 0 corrisponde ai casi in cui non c'è né il comportamento di smoking né quello di drinking; 1 corrisponde a solo smoking; 2 a solo drinking e 3 a tutti e due insieme

Table 12: frequency of smoking e drinking behaviour together

smoke_drink	Freq.	Percent	Cum.
0 no smoke no drink	2,354	60.44	60.44
1 smoke	172	4.42	64.85
2 drink	848	21.77	86.62
3 smoke & drink	521	13.38	100.00
Total	3,895	100.00	

Table 13: output of the multinomial logit estimation

Mlogit estimation	(1)	(2)	(3)
Ref: 0 neither smoke nor drink	1 to smoke	2 to drink	3 to smoke and to drink
Sex (male)	-0.04 (0.32)	0.57 (0.17)**	0.09 (0.22)
sexf2	0.52178 (0.34806)	0.19968 (0.16751)	**0.59218** **(0.21123)****
age last birthday	0.50 (0.08)**	0.51 (0.04)**	0.94 (0.08)**
ethnic groups (white)	1.19 (0.51)*	1.96 (0.41)**	2.47 (0.44)**
hpnssec5 Social Class (ref: managerial and professional occupations)			
intermediate occupations	1.02 (0.56)	0.03 (0.40)	-0.33 (0.48)
small employers and own account workers	0.18 (0.72)	0.13 (0.30)	0.35 (0.39)
lower supervisory and technical occupations	0.40 (0.58)	-0.27 (0.26)	-0.42 (0.36)
semi-routine occupations	1.27 (0.43)**	0.11 (0.22)	0.38 (0.27)
Other occupations	1.84 (0.79)*	-0.73 (0.97)	-0.73 (0.81)
Sdq questionnaire (ref: normality)			
sdq_totg==2 (borderline)	1.12 (0.48)*	0.43 (0.30)	1.10 (0.35)**
sdq_totg==3 (abnormality)	1.64 (0.42)**	0.15 (0.36)	1.34 (0.36)**
f2_fam	-0.33 (0.26)	-0.03 (0.12)	**-0.49** **(0.13)****
Constant	-10.52 (1.18)**	-9.06 (0.76)**	-15.65 (1.16)**
Observations	1183	1183	1183
Robust standard errors in parentheses			
* significant at 5%; ** significant at 1%			

As regards neither smoke nor drink (reference behaviour) the choice of both smoke and drink depends on several different variables. As regards to smoking, the probability to choose this behaviour increases with age (age last birthday is significant); it increases moving from higher to lower social classes (semi-routine occupations and other occupation are significant

with reference to managerial and professional occupations); with reference to having obtained normal score (sdq_totg==1) in the Strenght and Difficultes questionnaire, smoking probability increases with reference to borderline situations (sdq_totg==2) and to abnormality situations (sdq_totg==3).

Drinking probability (as regards neither smoke nor drink) increases with age and it is higher for boys rather than for girls (sex) and it is higher for white race youths (ethnic groups); the other variables which are significant for smoking are not significant for drinking.

Smoking and drinking probability increases with age (age last birthday) and it is higher for white race youths. In increases among youths with a borderline or an abnormal score in Strenght and Difficulties questionnaire.

f2_fam variable, the social relations quality index, is significant and has negative sign, only in the case of the "smoke and drink" behaviour. Since an interaction term between sex and f2_fam has been used as control in this regression, the negative affection of social relation on "smoke and drink" works only for girls.
Only in the female case, it is possible to affirm that the probability of "smoke and drink" is reduced by a high social relation quality index. To interpret the interaction term sexf2 in a better way the same multinomial logit has been estimated separately for male and female. The results are shown in the following tables.

Table 14: output of the multinomial logit for males

Male	(1)	(2)	(3)
Ref: neither Smoke nor Drink	1 Smoke	2 Drink	3 Smoke and Drink
age last birthday	0.51 (0.13)**	0.50 (0.06)**	0.75 (0.09)**
ethnic groups	2.47540 (1.26350)	1.88381 (0.48300)**	2.93552 (0.75248)**
hpnssec5 Social Class (ref: managerial and professional occupations)			
intermediate occupations	-34.06 (0.61)**	-0.12 (0.50)	-0.61 (0.59)
small employers and own account workers	-33.91 (0.61)**	0.14 (0.45)	0.63 (0.56)
lower supervisory and technical occupations	0.58 (0.88)	-0.12 (0.37)	-0.20 (0.47)
semi-routine occupations	1.47 (0.62)*	0.16 (0.29)	0.21 (0.38)
other	2.38 (0.96)*	-1.65 (1.19)	-36.62 (0.75)**
Sdq questionnaire (ref: normality)			
sdq_totg==2 (borderline)	1.40 (0.75)	0.83 (0.42)*	1.62 (0.48)**
sdq_totg==3 (abnormality)	1.50 (0.66)*	-0.01 (0.47)	1.23 (0.45)**
f2_fam	0.10 (0.27)	0.18 (0.13)	**0.10** **(0.16)**
Constant	-11.99 (2.00)**	-8.38 (0.92)**	-13.46 (1.48)**
Observations	571	571	571

Robust standard errors in parentheses			
* significant at 5%; ** significant at 1%			

Table 15: output of the multinomial logit for females

Female	(1)	(2)	(3)
Ref: neither Smoke nor Drink	1 Smoke	2 Drink	3 Smoke and Drink
age last birthday	0.49 (0.10)**	0.53 (0.07)**	1.22 (0.12)**
ethnic groups (white)	0.62150 (0.55099)	2.14125 (0.73125)**	2.36254 (0.58931)**
hpnssec5 Social Class (ref: managerial and professional occupations)			
intermediate occupations	1.49 (0.67)*	0.12 (0.60)	-0.18 (0.77)
small employers and own account workers	0.69 (0.79)	0.15 (0.37)	0.12 (0.48)
lower supervisory and technical occupations	0.30 (0.79)	-0.40 (0.39)	-0.52 (0.53)
semi-routine occupations	1.08 (0.61)	0.10 (0.30)	0.61 (0.38)
Other	-31.35 (0.70)**	0.43 (1.20)	0.47 (0.87)
Sdq questionnaire (ref: normality)			
sdq_totg==2 (borderline)	0.63 (0.65)	-0.07 (0.40)	0.42 (0.54)
sdq_totg==3 (abnormality)	1.59 (0.57)**	0.48 (0.56)	1.62 (0.58)**
f2_fam	-0.34 (0.25)	-0.05 (0.12)	**-0.58** **(0.14)****
Constant	-9.83 (1.54)**	-9.38 (1.30)**	-19.32 (1.83)**
Observations	612	612	612
Robust standard errors in parentheses			
* significant at 5%; ** significant at 1%			

F2_fam is significant for girls only when drink and smoke are both considered and when the alternative behaviour is neither smoke nor drink. The total effect for male is the sum of the estimated coefficients of the variables f2_fam and sexf2. this sum is 0.10 when multinomial logit estimation is run both for males and females. This estimated coefficient is not significant when the estimation is run for males only. This result allow to affirm that the effect of f2_fam work only in the female case.

Conclusions

Comparing smoking probit model, drinking probit model and the multinomial logit that represents the three bad behaviours taking the good behaviour as reference, it is possible to draw the following conclusions. Just for England and just in relation to observed characteristics and just for girls, a good quality in social relations, meant as social capital in terms of trust, decreases the probability of both smoking and drinking when the alternative behaviour is neither smoke nor drink. Smoking choice when the alternative is represented by all other possible behaviours (drink, smoke, drink and smoke, neither drink nor smoke), for females is reduced through a good quality in social interactions. Drinking choice is not reduced through high quality social relations, neither for males nor for females. This means that females both smoking and drinking is a behaviour reduced through social capital presence, but between the two "sins", alcohol is more tolerated.

The importance of the social component, relative to tobacco smoking and to both smoking and drinking, and just for females, sheds light on the fact that to prevent this kind of behaviour it is necessary to act on the social environment and, in particular, on the quality of social relations in terms of trust and fairness. Good quality social relations allow a deeper and quicker diffusion of the idea that these behaviours are wrong since dangerous for health. Information diffusion, when the quality of relation is good, allows the birth of social norms able to compete against consumption norms "created" by firms producing, in particular, cigarettes.
In reference to alcohol consumption, a deep social opposition able to prevent such behaviour among youths, does not exist in the data analyzed. It is possible, however, that alcohol consumption depends on endogenous interactions and not on contextual interactions. It is possible that a form of peer influence among youths, exists about this behaviour, in reference to the fact that this behaviour has a strong socialization component.

Appendix – Sdq Questionnaire (Questions and Scores)

Scoring the Informant-Rated Strengths and Difficulties Questionnaire

The 25 items in the SDQ comprise 5 scales of 5 items each. It is usually easiest to score all 5 scales first before working out the total difficulties score. Somewhat True is always scored as 1, but the scoring of Not True and Certainly True varies with the item, as shown below scale by scale. For each of the 5 scales the score can range from 0 to 10 if all 5 items were completed. Scale score can be prorated if at least 3 items were completed.

Emotional Symptoms Scale	Not True	Somewhat True	Certainly True
Often complains of headaches, stomach-aches ...	0	1	2
Many worries, often seems worried	0	1	2
Often unhappy, downhearted or tearful	0	1	2
Nervous or clingy in new situations ...	0	1	2
Many fears, easily scared	0	1	2

Conduct Problems Scale	Not True	Somewhat True	Certainly True
Often has temper tantrums or hot tempers	0	1	2
Generally obedient, usually does what ...	2	1	0
Often fights with other children or bullies them	0	1	2
Often lies or cheats	0	1	2
Steals from home, school or elsewhere	0	1	2

Hyperactivity Scale	Not True	Somewhat True	Certainly True
Restless, overactive, cannot stay still for long	0	1	2
Constantly fidgeting or squirming	0	1	2
Easily distracted, concentration wanders	0	1	2
Thinks things out before acting	2	1	0
Sees tasks through to the end, good attention span	2	1	0

Peer Problems Scale	Not True	Somewhat True	Certainly True
Rather solitary, tends to play alone	0	1	2
Has at least one good friend	2	1	0
Generally liked by other children	2	1	0
Picked on or bullied by other children	0	1	2
Gets on better with adults than with other children	0	1	2

Prosocial Scale	Not True	Somewhat True	Certainly True
Considerate of other people's feelings	0	1	2
Shares readily with other children	0	1	2
Helpful if someone is hurt, upset of feeling ill	0	1	2
Kind to younger children	0	1	2
Often volunteers to help others	0	1	2

The Total Difficulties Score:

is generated by summing the scores from all the scales except the prosocial scale. The resultant score can range from 0 to 40 (and is counted as missing if one of the component scores is missing).

Interpreting Symptom Scores and Defining "Caseness" from Symptom Scores

Although SDQ scores can often be used as continuous variables, it is sometimes convenient to classify scores as normal, borderline and abnormal. Using the bandings shown below, an abnormal score on one or both of the total difficulties scores can be used to identify likely "cases" with mental health disorders. This is clearly only a rough-and ready method for detecting disorders – combining information from SDQ symptom and impact scores from multiple informants is better, but still far from perfect. Approximately 10% of a community sample scores in the abnormal band on any given score, with a further 10% scoring in the borderline band. The exact proportions vary according to country, age and gender – normative SDQ data are available from the web site. You may want to adjust banding and caseness criteria for these characteristics, setting the threshold higher when avoiding false positives is of paramount importance, and setting the threshold lower when avoiding false negatives is more important.

	Normal	Borderline	Abnormal
Parent Completed			
Total Difficulties Score	0 - 13	14 - 16	17 - 40
Emotional Symptoms Score	0 - 3	4	5 - 10
Conduct Problems Score	0 - 2	3	4 - 10
Hyperactivity Score	0 - 5	6	7 - 10
Peer Problems Score	0 - 2	3	4 - 10
Prosocial Behaviour Score	6 - 10	5	0 - 4
Teacher Completed			
Total Difficulties Score	0 - 11	12 - 15	16 - 40
Emotional Symptoms Score	0 - 4	5	6 - 10
Conduct Problems Score	0 - 2	3	4 - 10
Hyperactivity Score	0 - 5	6	7 - 10
Peer Problems Score	0 - 3	4	5 - 10
Prosocial Behaviour Score	6 - 10	5	0 - 4

Generating and Interpreting Impact Scores

When using a version of the SDQ that includes an "Impact Supplement", the items on overall distress and social impairment can be summed to generate an impact score that ranges from 0 to 10 for the parent-completed version and from 0-6 for the teacher-completed version.

	Not at all	Only a little	Quite a lot	A great deal
Parent report				
Difficulties upset or distress child	0	0	1	2
Interfere with HOME LIFE	0	0	1	2
Interfere with FRIENDSHIPS	0	0	1	2
Interfere with CLASSROOM LEARNING	0	0	1	2
Interfere with LEISURE ACTIVITIES	0	0	1	2
Teacher report				
Difficulties upset or distress child	0	0	1	2
Interfere with PEER RELATIONSHIPS	0	0	1	2
Interfere with CLASSROOM LEARNING	0	0	1	2

Responses to the questions on chronicity and burden to others are not included in the impact score. When respondents have answered "no" to the first question on the impact supplement (i.e. when they do not perceive the child as having any emotional or behavioural difficulties), they are not asked to complete the questions on resultant distress or impairment; the impact score is automatically scored zero in these circumstances.

Although the impact scores can be used as continuous variables, it is sometimes convenient to classify them as normal, borderline or abnormal: a total impact score of 2 or more is abnormal; a score of 1 is borderline; and a score of 0 is normal.

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