

Título: The non-monetary effects of education on the consumption, and the abusive consumption, of alcohol in Spain

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Abstract

Este artículo analiza la existencia de efectos no monetarios de la educación en el consumo, y el abuso en el consumo, de alcohol en España. Los datos utilizados para llevar a cabo la investigación provienen de la Encuesta Nacional de Salud de 1997. Los resultados muestran que la educación aumenta la probabilidad relativa de consumir alcohol, pero reduce la probabilidad relativa de abusar en su consumo. Aunque en economía, estos resultados son explicados desde la teoría del capital humano, en este artículo se ha preferido dar una interpretación que proviene de la escuela institucionalista.

1. Introduction

This study belongs to the field of the analysis of the non-monetary effects of education, that is to say the effect of education on factors not connected with obtaining income on the labour market. In spite of having received little attention in the economics of education literature, Wolfe & Zuvekas (1997) suggest that these non-monetary effects are of the same magnitude as the monetary ones.

This study has two main objectives: firstly, it brings in theoretical elements of an institutionalist type in order to explain the observed phenomena from an approach distinct to that put forward by the neoclassical school (the only one that has so far dealt with the non-monetary effects of education); secondly, by way of an application, the non-monetary effects of education on the consumption and the abusive consumption of alcohol are analysed empirically, in the case of Spain.

2. Conceptual issues

The non-monetary effects of education on the consumption of goods that affect the state of health of individuals are dealt with mainly, within neoclassical analysis, from two approaches: on the one hand, the study of the effect of education on the efficiency of the 'production' of health, and on the other hand, its effect on the time preference rate.

In the first approach, Grossman (1972a, 1972b) considers that individuals 'produce' health by using a series of inputs (such as time, some goods and services, medical care, and human capital) to obtain the output 'good health'. In this model education allows the efficiency of production to be increased, that is to say that given certain inputs, a greater quantity of health is obtained. This is due to the fact that more educated individuals possess more information, and are more capable of analysing new information, about how to obtain a good state of health.

Within this approach, Rosenzweig & Schultz (1981) and Kenkel (1995) consider that education allows a better choice of inputs (or habits of consumption) that influence the state of health, such as the consumption of alcohol, tobacco, a certain nutritional diet, doing physical exercise, etc. If education increases, or allows a better understanding of, information referring to the real effects of these inputs on health, it makes a more efficient choice of them possible (these authors call this 'allocative' efficiency) and, therefore, will improve the state of health of those with a higher level of education.

In the second approach, Becker & Mulligan (1997) point out that the positive non-monetary effect of education on health is due to the fact that formal education reduces the time preference rate, in such a way that individuals orient more towards the future and therefore ‘invest’ more in health (that is, follow a more healthy life-style). This model can be related to the ‘theory of rational addiction’ that supposes that addictions, like the consumption of alcohol, arise from rational processes of maximising utility, given certain preferences, where taking decisions about present consumption depends as much on past consumption as on the future consequences foreseen by individuals –see Becker & Murphy (1988)–. In this framework, the more educated have less preference for the present and because of this are more capable of rejecting addictive behaviour (that derives from high time preference).

Despite the existence of the debate we have pointed to between the various contributions of neoclassical authors, we believe that these approaches over-simplify the analysis. On the one hand, theories based on efficiency reduce the non-monetary effects of education on consumption exclusively to increases in efficiency. On the other hand, the models linked to the time preference rate assume that addictive behaviour arises from rational choices that maximise utility, a matter that is more than debatable.¹ Although no alternative economic theory exists, the ideas about the economic analysis of consumption of authors belonging to the institutionalist school –see Veblen (1899), Duesenberry (1949), Galbraith (1971), Wheelock and Oughton (1996), Cowan *et al.* (1997), Ackerman (1997) and Schor (1999)– provide a set of theoretical tools that allow the non-monetary effects of education on consumption, in general and connected with health, to be studied on the basis of more realistic assumptions and from a broader perspective .

From the institutionalist approach, the study of the non-monetary effects of education can be extended beyond efficiency and neoclassical rationality, considering other mechanisms through which education influences the habits that affect the health of individuals. In this way the centre of attention must move towards the effect of education on individual preferences, including the influence of the social, cultural and family environment, and of supply as well. Moreover, education may generate different effects on individuals with different characteristics (such as gender) due to its role in the socialization process.

With regard to efficiency, the following points should be made: in the first place, it is not a matter of denying the existence of the increases of efficiency that education can generate, but of refusing to accept that they should be assumed beforehand (and therefore affirming that they must be empirically demonstrated); secondly, efficiency must be defined not only in its traditional economic sense, but also considering consumption behaviour to be efficient when it

is in accordance with the values that society considers desirable. Therefore, education can increase efficiency if it stimulates this type of consumption. Finally, it should be pointed out that although the neoclassical literature refers to the non-monetary effects of education as non-monetary ‘benefits’, as the only possible effect of education is positive (increasing efficiency or reducing the time preference rate), the institutionalist orientation of this study entails maintaining the term ‘effects’.

3. Empirical evidence concerning the non-monetary effects of education on health through its effect on the consumption of alcohol

As can be seen in Grossman & Kaestner (1999), the empirical studies referring to the non-monetary effects of education on health are very numerous, although mainly for the United States of America, showing, mostly, that education has positive effects on health.

With regard to the studies that analyse the non-monetary effects of education on the consumption of alcohol, in the United States, Kenkel (1991), Blaylock & Blisard (1993) and Ross & Wu (1995) demonstrate that the higher the level of education of individuals the greater the probability that they consume alcohol, while Sander (1999) points to, with some exceptions, a negative relation. Nevertheless, in all the studies mentioned it is concluded that the more educated individuals are the less probability they have of consuming alcohol abusively. With regard to this, however, Hrabá *et al.* (1998) observe that in the Czech Republic education has no effect on the abuse of alcohol.

Therefore, the majority of the empirical evidence indicates that education favours a better state of health derived from its negative effect on the abusive consumption of alcohol. Similarly, although the effects of education on the consumption of alcohol are not conclusive, the studies that show a positive causal relation (the majority) indicate that this effect improves the state of health. Even so, in this respect, various reports from the World Health Organisation, as well as the Spanish Ministry of Health and Consumption insist that, with some exceptions, the consumption of alcohol, even though it is moderate, damages the health, especially in the long term (see WHO, 1994; MSC, 2002). Similarly, we do not believe that the positive effect of education on the consumption of alcohol, even moderate consumption, can be linked to efficiency, as it is doubtful that anybody consumes alcohol to improve their state of health.

4. Hypothesis, data and methodology of the empirical analysis

4.1. Hypothesis

1. Education increases the probability of alcohol consumption.
2. Education reduces the probability of abusive alcohol consumption.
3. Education increases the efficiency of consumption linked to health.

4.2. Data and methodology

The data used to test the hypotheses postulated come from the National Survey of Health for 1997 (*Encuesta Nacional de Salud de 1997*, hereafter ENS97), of the Spanish Ministry of Health and Consumption. The sample covers 6,396 adults (over 15 years), whose data are gathered into four quarterly waves. However, in order to only include those who had finished their studies, individuals of at least 25 years of age were selected, thereby reducing the potential sample to 5,194 persons. The ENS97 allows the following independent variables, which are used in the empirical analysis, to be elaborated:

- *Personal*: age, sex, health (according to whether the individual suffers or not from a chronic illness), marital status, and years of schooling of the individuals in the sample.
- *Geographical*: Regions and size of the municipality (according to the number of inhabitants) where the individuals reside.
- *Socioeconomic*: work status of the individuals (if active), social class of the main wage-earner, and family income (defined as total monthly family income).

With regard to education, the ENS97 only provides information about the level of education reached, for which reason the variable ‘years of schooling’ was generated from the educational variable by levels.² The characteristics of the samples used in the empirical analysis can be seen in Table 1, in which the fact that 52.2% of the interviewees declared that they had consumed alcohol during the two weeks before the interview, against the 4.8% that had abused the consumption of alcohol, stands out. With respect to education, the individuals had an average of 8 years of schooling, that is, on average, they had finished lower secondary education.

With regard to the dependent variables, the following should be pointed out. The variable ‘alcohol’, corresponding to the consumption of alcohol, is of a dichotomous nature, in such a way that it takes the value ‘1’ if individuals declared they had drunk alcohol in the two weeks before the interview and ‘0’ if they had not. The variable ‘heavy drinker’ corresponding to the

abusive consumption of alcohol, was obtained through the following process. The interviewees declared, for various types of drink, the quantity of drinks that they consumed, each time they drank alcohol, and the frequency of consumption. As the ENS97 provides an equivalence scale between the various types of alcoholic drink, the quantity of alcohol consumed can be determined (in cubic centimetres of alcohol per week). This quantity, for each type of drink (C_i), is calculated through the following expression: $C_i = q_i * f_i * e_i$; with q_i (the quantity of drink consumed each time that alcohol is drunk –number of drinks–); f_i (frequency of consumption per week); e_i (cubic centimetres of pure alcohol per drink); ‘i’ (type of drink being considered, six in all). Therefore, the total weekly consumption (C_T) is obtained from the following expression: $C_T = \sum_{i=1}^6 C_i$

In the empirical analysis it is considered that an individual is abusing the consumption of alcohol if the quantity consumed corresponds to the definition of heavy or excessive drinker of ENS97.³ In this way a dichotomous variable is generated that takes the value ‘0’ for those that do not drink alcohol, or drink in a light or moderate manner, and ‘1’ for those individuals that drink a quantity that is heavy or excessive. From the equivalence scale provided by the ENS97 it can be deduced that a heavy consumption of alcohol equals, approximately, a minimum of 6 glasses of wine, 9 glasses of beer, 4 glasses of brandy or 2.5 glasses of whisky *per day*.

The technique of analysis in the testing of the first two hypotheses consists in the application of logistic regressions, given the dichotomous nature of the dependent variables. The third hypothesis is tested from the results obtained in the testing of the previous hypotheses.

Thus, the estimated model is the following: $P = p(S_i, X_i, e_i)$, considering two independent equations, one for each action considered (alcohol consumption and abusive consumption of alcohol). “P” is the relative probability of consuming alcohol or abusing in the consumption of alcohol (the term “relative” means that the estimate parameters –“B” in the tables of results– show the effect of each independent variable on (the logarithm of) the probability that the event takes place with regard it does not take place; for example, the probability that an individual consumes alcohol with regard that s/he does not). “ S_i ” are years of schooling of individuals; “ X_i ” includes several characteristics of the individuals (except schooling), that is, the rest of independent variables described previously; finally, “ e_i ” covers the unobservable determinants of the actions analyzed.

Table 1. Variable description, means, and standard deviations

Variables	Number of observations	Mean value	Standard deviation
ALCOHOL (yes=1)	4,963	0.522	0.500
HEAVY DRINKER (yes=1)	4,963	0.048	0.214
SEX (male=1)	4,963	0.482	0.500
AGE	4,963	49.460	16.335
HEALTH (good health=1)	4,963	0.660	0.474
ACTIVE (yes=1)	4,963	0.519	0.500
MSTATUS1 (Single)	849	0.171	0.377
MSTATUS2 (Married)	3,558	0.717	0.451
MSTATUS3 (Divorced)	132	0.027	0.161
MSTATUS4 (Widow/er)	424	0.085	0.280
SCHOOLING (years of schooling)	4,963	7.917	4.380
REGION01 (Andalucía)	816	0.164	0.371
REGION02 (Aragón)	162	0.033	0.178
REGION03 (Asturias)	143	0.029	0.167
REGION04 (Balears)	98	0.020	0.139
REGION05 (Canarias)	176	0.035	0.185
REGION06 (Cantabria)	62	0.012	0.111
REGION07 (Castilla y León)	345	0.070	0.254
REGION08 (Castilla-La Mancha)	222	0.045	0.207
REGION09 (Catalunya)	811	0.163	0.370
REGION10 (C. Valenciana)	496	0.100	0.300
REGION11 (Extremadura)	141	0.028	0.166
REGION12 (Galicia)	368	0.074	0.262
REGION13 (Madrid)	622	0.125	0.331
REGION14 (Murcia)	122	0.025	0.155
REGION15 (Navarra)	67	0.013	0.115
REGION16 (País Vasco)	279	0.056	0.230
REGION17 (La Rioja)	33	0.007	0.081
MUNICIP1 (Municipality under 2000 inhabitants)	384	0.077	0.267
MUNICIP2 (From 2001 to 10000 inhabitants)	896	0.181	0.385
MUNICIP3 (From 10001 to 50000 inhabitants)	1,177	0.237	0.425
MUNICIP4 (From 50001 to 100000 inhabitants)	412	0.083	0.276
MUNICIP5 (From 100001 to 400000 inhabitants)	1,167	0.234	0.423
MUNICIP6 (From 400001 to 1000000 inhabitants)	313	0.063	0.243
MUNICIP7 (More than 1000000 inhabitants)	620	0.125	0.331
INCOME1 (Less than 360.61 euros)	411	0.083	0.276
INCOME2 (From 360.62 to 601.01 euros)	1,127	0.227	0.419
INCOME3 (From 601.02 to 901.52 euros)	1,161	0.234	0.423
INCOME4 (From 901.531 to 1202.02 euros)	677	0.136	0.343
INCOME5 (From 1202.03 to 1804.04 euros)	379	0.076	0.266
INCOME6 (More than 1804.04 euros)	269	0.054	0.226
INCOME7 (Unknown income)	939	0.189	0.392
SOCIAL1 (Capitalists)	1,008	0.203	0.402
SOCIAL2 (Middle classes in management and higher administration)	636	0.128	0.334
SOCIAL3 (subordinate middle-classes)	686	0.138	0.345
SOCIAL4 (Workers)	2,633	0.531	0.499

5. Results

5.1. Hypothesis 1: education increases the probability of alcohol consumption

Table 2 shows the significance of the variable ‘years of schooling’ (with a positive sign) and the interaction term ‘schooling*sex’ (with a negative sign). The values of these variables allow it to be stated that education positively affects the relative probability of drinking alcohol in both sexes, although this effect is greater for women.⁴ With regard to the rest of the variables, to be a man, not to suffer from a chronic illness, to be active, as well as to belong to the upper levels of income, increase the relative probability of drinking alcohol. As for age, this reduces the relative probability of consuming alcoholic drinks.

Table 2. Results from the logistic regression analysis: relative probability of drinking alcohol

Variables	B	S.E.	Wald	Significant	Exp(B)
SEX	1.891**	0.138	188.660	0.000	6.623
AGE	-0.014**	0.003	26.013	0.000	0.986
HEALTH	0.375**	0.074	26.049	0.000	1.455
ACTIVE	0.223**	0.084	7.124	0.008	1.250
SCHOOLING	0.061**	0.012	25.117	0.000	1.062
SCHOOL*SEX	-0.054**	0.015	12.996	0.000	0.948
REGION02	0.032	0.203	0.025	0.874	1.033
REGION03	-0.026	0.208	0.015	0.901	0.975
REGION04	0.308	0.254	1.467	0.226	1.360
REGION05	-0.373	0.190	3.849	0.050	0.689
REGION06	-0.167	0.297	0.314	0.575	0.847
REGION07	0.226	0.152	2.193	0.139	1.253
REGION08	0.089	0.175	0.256	0.613	1.093
REGION09	0.201	0.121	2.766	0.096	1.223
REGION10	0.133	0.128	1.076	0.300	1.142
REGION11	0.530*	0.209	6.427	0.011	1.698
REGION12	0.188	0.145	1.690	0.194	1.207
REGION13	-0.118	0.152	0.604	0.437	0.889
REGION14	0.596**	0.220	7.304	0.007	1.814
REGION15	-0.446	0.287	2.408	0.121	0.640
REGION16	0.203	0.163	1.552	0.213	1.225
REGION17	0.100	0.399	0.062	0.803	1.105
MUNICIP1	-0.046	0.141	0.106	0.745	0.955
MUNICIP2	0.232*	0.104	5.033	0.025	1.261
MUNICIP4	-0.066	0.131	0.252	0.616	0.936
MUNICIP5	0.184	0.097	3.633	0.057	1.202
MUNICIP6	0.261	0.156	2.781	0.095	1.298
MUNICIP7	0.538**	0.147	13.467	0.000	1.713
INCOME1	0.043	0.134	0.100	0.752	1.043
INCOME2	-0.008	0.096	0.007	0.931	0.992
INCOME4	0.103	0.110	0.875	0.350	1.108
INCOME5	0.381**	0.141	7.335	0.007	1.463
INCOME6	0.699**	0.174	16.050	0.000	2.012
INCOME7	0.281**	0.103	7.404	0.007	1.325
Constant	-1.120**	0.227	24.331	0.000	0.326

**Significant at 1% level. *Significant at 5% level.

Categories of reference: REGION01, MUNICIP3, INCOME3.

S.E.: standard error; exp (B): exponential (B).

5.2. Hypothesis 2: Education reduces the probability of abusive alcohol consumption

As can be seen in Table 3, concerning education, only the variable ‘years of schooling’ is significant (with a negative sign), in a way that education reduces the relative probability of abusing alcohol, for both sexes. Therefore the hypothesis put forward can be accepted. With regard to the remainder of the variables, it is noticeable that to be a man and to be active affects the relative probability of abusing the consumption of alcohol.

Even so, if the effect of education on the relative probability of abusive consumption of alcohol is considered by ages, this does not affect those above 55 years of age, while it does affect lower ages (see table 4).

Table 3. Results from the logistic regression analysis: relative probability of abusive consumption of alcohol

Variables	B	S.E	Wald	Significant	Exp(B)
SEX	2.931**	0.303	93.811	0.000	18.749
ACTIVE	0.848**	0.179	22.488	0.000	2.335
SCHOOLING	-0.081**	0.023	11.876	0.001	0.923
REGION02	0.644	0.350	3.396	0.065	1.904
REGION03	0.022	0.468	0.002	0.963	1.022
REGION04	0.710	0.426	2.774	0.096	2.034
REGION05	-0.171	0.409	0.174	0.676	0.843
REGION06	-0.414	0.754	0.301	0.583	0.661
REGION07	0.200	0.288	0.480	0.488	1.221
REGION08	-0.185	0.389	0.227	0.633	0.831
REGION09	-0.603*	0.276	4.772	0.029	0.547
REGION10	-0.575	0.307	3.516	0.061	0.563
REGION11	0.744*	0.353	4.451	0.035	2.104
REGION12	0.668**	0.252	7.050	0.008	1.950
REGION13	-0.646	0.334	3.735	0.053	0.524
REGION14	-0.100	0.465	0.046	0.830	0.905
REGION15	-0.512	0.756	0.459	0.498	0.599
REGION16	0.308	0.322	0.917	0.338	1.361
REGION17	1.049	0.673	2.432	0.119	2.854
INCOME1	0.144	0.271	0.283	0.595	1.155
INCOME2	-0.211	0.203	1.078	0.299	0.810
INCOME4	-0.543*	0.265	4.208	0.040	0.581
INCOME5	0.114	0.322	0.125	0.724	1.121
INCOME6	-0.180	0.448	0.162	0.687	0.835
INCOME7	-0.110	0.218	0.255	0.614	0.896
SOCIAL1	-0.006	0.176	0.001	0.972	0.994
SOCIAL2	-0.193	0.282	0.468	0.494	0.825
SOCIAL3	-0.972**	0.326	8.874	0.003	0.378
Constant	-4.928**	0.377	171.121	0.000	0.007

**Significant at 1% level. *Significant at 5% level. S.E.: standard error; exp (B): exponential (B). Categories of reference: REGION01, INCOME3, SOCIAL4.

Table 4. Results from the logistic regression analysis: relative probability of abusive consumption of alcohol by age.

Variables	Individuals between 25 and 55 years old				Older than 55 years			
	B	S.E.	Sig.	Exp(B)	B	S.E.	Sig.	Exp(B)
SEX	3.147**	0.409	0.000	23.272	0.2882**	0.469	0.000	17.850
ACTIVE	0.978*	0.419	0.019	2.659				
MSTATUS1	-0.252	0.211	0.233	0.777				
MSTATUS3	1.014*	0.421	0.016	2.757				
MSTATUS4	0.405	0.832	0.626	1.500				
SCHOOLING	-0.121**	0.029	0.000	0.886	0.025	0.048	0.599	1.026
REGION02	0.976*	0.426	0.022	2.653				
REGION03	-0.628	0,768	0.414	0.534				
REGION04	0.967	0.530	0.068	2.630				
REGION05	-0.645	0.564	0.253	0.525				
REGION06	-0.011	0.785	0.989	0.989				
REGION07	0.267	0.368	0.468	1.306				
REGION08	0,092	0.442	0.834	1.097				
REGION09	-0.093	0.306	0.761	0.911				
REGION10	-0.505	0.358	0.158	0.603				
REGION11	0.472	0.469	0.315	1.603				
REGION12	0.882**	0.311	0.005	2.415				
REGION13	-0.373	0.410	0.362	0.688				
REGION14	0.242	0.534	0.650	1.274				
REGION15	-17.938	5466.0	0.997	0.000				
REGION16	0.222	0.407	0.585	1.249				
REGION17	1.104	0.838	0.188	3.016				
INCOME1	-0.070	0.383	0.856	0.933	0.652	0.427	0.127	1.920
INCOME2	-0.208	0.249	0.404	0.812	0.056	0.366	0.878	1.058
INCOME4	-0.794**	0.302	0.009	0.452	0.425	0.560	0.448	1.529
INCOME5	0.005	0.358	0.988	1.005	0.666	0.843	0.430	1.946
INCOME6	-0,662	0.573	0.248	0.516	1.297	0.746	0.082	3.658
INCOME7	-0,337	0.256	0.188	0.714	0.726	0.407	0.075	2.067
SOCIAL1	0.161	0.216	0.456	1.174	-0.260	0.314	0.408	0.771
SOCIAL2	-0.054	0.340	0.874	0.948	-0.721	0.578	0.212	0.486
SOCIAL3	-0.888*	0.386	0.021	0.411	-1.472*	0.650	0.023	0.230
Constant	-4.910**	0.556	0.000	0.007	-5.582**	0.580	0.000	0.004
Sample :	3.096				1.867			

**Significant at 1% level. *Significant at 5% level. Categories of reference: MSTATUS2, REGION01, INCOME3, SOCIAL4. S.E.: standard error; Sig.: significant; exp (B): exponential (B).

5.3. Hypothesis 3: Education increases the efficiency of consumption linked to health

The results obtained in the testing of Hypothesis 2 allow it to be supposed that education increases efficiency in the production of health, as this reduces the probability of abusing the consumption of alcohol. However, the results seen in the testing of the first hypothesis are not easy to interpret from the point of view of efficiency, as education increases the relative probability of consuming alcohol. These comments can be extended to the theory that education benefits the health through its influence on the time preference rate.

Our intention is not so much to deny the positive effect that education may have on efficiency in the production of health but to point out that consumption related to health is not guided exclusively by criteria of efficiency. Therefore, the non-monetary effects of education on

consumption are not limited to its effect on efficiency, but are related to the formation of preferences in which social and cultural factors that influence these effects also take part.

6. Discussion and Conclusions

The empirical study presented in the previous sections shows that education reduces the relative probability that individuals abuse the consumption of alcohol, while it increases the relative probability of consuming alcohol. As was pointed out in Section 2, the conclusion could come from the neoclassical school that, for the first set of results, education produces non-monetary benefits for health derived from increasing the efficiency of the ‘production of health’, or even that education orients individuals towards the future (as it reduces the time preference rate) and, as a consequence, they invest in their welfare by having more healthy habits. Nevertheless, the second set of results is difficult to explain from an orthodox neoclassical approach, as education encourages behaviour in consumption that is negative for the health. Based on the assumptions of the institutionalist school, described in the second section, certain ideas are pointed out below that allow the results obtained to be explained (although empirical research would be required to test the arguments presented below).

With regard to the effect of education on the relative probability of drinking alcohol, it can be supposed that there is a greater probability of consuming alcohol among the advantaged social groups, where the more educated predominate, due to attendance at a greater number of social events, for work or leisure. Similarly, the consumption of certain alcoholic drinks (such as wine and similar drinks) produces *connoisseurs* - and this is more probable among the more educated-. Neither should the family socialisation process be ignored: the greater probability of drinking alcohol of the more educated may be transferred to children (adolescents) who consider the consumption of alcohol to be a way to enter the adult world.

Similarly, the greater effect of education on the probability of consuming alcoholic drinks in women could be caused for the following reasons. Firstly, the consumption of alcohol may have been considered by women as a way of developing traditionally masculine behaviour, those women with a higher level of education being in the vanguard. Secondly, the greater entry into the labour market of more educated women, and the types of work they enter, involve greater interaction with men (who have a greater probability of drinking alcohol) so they more easily acquire this type of habit. Thirdly, this entry into the labour market increases stress derived from the doubling of the working day (at work and at home) that could encourage the habit of consuming alcohol. Finally, supply pressure should be considered, as it is more and more directed towards the capture of new population groups, amongst which are women, through

direct advertising, through product promotion by sponsoring various activities (musical events, travel and prizes, etc.), or by using alcohol brand names on other objects –see MSC (2002)-.

With regard to the negative effect of education on the relative probability of abusing the consumption of alcohol, this result is in accordance with neoclassical ideas; those with a higher level of education do not consume alcohol abusively in order, among other reasons, not to damage their health. However, if the observations pointed to in the previous hypothesis are considered, the inclusion of institutional factors provides a more complete view of the means by which the observed effects are produced. The more educated may feel more fulfilled in their work, have a greater sensation of control over their lives, and have better social relations with their family and their social environment, all of which diminish the probability of abusing alcohol (see Ross & Wu, 1995).

Likewise, with regard to the effect of education on the time preference rate, difficulties may be foreseen in accepting this theory due to the fact that the negative effects of addictive habits, such as drinking alcohol, usually appear much later than the average age of initiation in the *regular* consumption of these products –in Spain this age is placed at around 18 years (MSC, 2002)–. Also, as was indicated in the previous section, education does not affect the relative probability of abusing the consumption of alcohol in those over 55 years of age, while it does have an influence on previous ages. It seems logical to consider that it is the addiction to these habits that prevents education from altering them, as remaining addicted during a long period of time causes a substantial reduction of the ability to choose whether to continue or not with the corresponding habit of consumption.

Finally, an unexpected result of the analysis is the absence of significance for the greater part of the variables related to social class. However, the fact that the study presented only considers whether individuals consume, or not, alcohol, and not the type of drink, the brand, or the amount spent, subtracts significance from social differentiation, especially in an article that is accessible to all social classes. Similarly, although no significant social differentiation was observed in the consumption of alcohol, the effects of certain variables, such as income, the geographical location of the home, marital status, sex, age and the work situation, suggest the existence of an effect of the social and cultural environment on it.

To sum up, the results presented allow it to be stated that education produces, simultaneously, positive and negative non-monetary effects on health. We believe that the neoclassical explanation of these effects, based on the supposition that education positively influences the efficiency, both productive and allocative, of individuals in the ‘production’ of health, or on the

supposition that it has an effect on the time preference rate, appear to be insufficient for understanding the mechanisms by which education produces non-monetary effects on health.

As an alternative, the article proposes explanations based on the assumptions of the institutionalist school, which centre analysis on the effect of education on the formation of preferences. In this way it has been suggested that education may increase the relative probability of consuming alcohol due, among other reasons, to the social and family environment of the more educated. Likewise, the negative non-monetary effects of education on the probability of abusing the consumption of alcohol may be linked to the better quality of life of the more educated, due to greater fulfilment at work and better social and family relations.

Finally, we suggest to extend this kind of research with methodologies that allow studying the preferences of individuals and, therefore, verifying the mechanisms through which education influences on the consumption of alcohol that have been indicated previously.

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Notes

1. See, for example, the following critiques to the rational addiction theory: Winston (1980) that only considers the incidence of past consumption on present consumption decisions; the critique to time consistency in consumption of Ainslie (1992); the model of limited rationality (Orphanides & Zervos 1995); Suranovic *et al.* (1999), who includes habit in his model on the consumption of addictive goods. In addition, Fuchs (1982) and Farrell & Fuchs (1982) reject the statement that education influences the state of health of individuals. For these authors, it is the time preference rate that simultaneously influences the level of education and the production of health, so that the positive correlation that can be seen between education and health is not due to a causal effect of the first on the second, but of the time preference rate on both of them.
2. To generate the educational variable in years of schooling the following equivalence scale was used: those without education were given 3 years of schooling; those with primary education, 5 years; lower secondary education, 8 years; vocational upper secondary education, 10 and 13 years depending on the level reached; general upper secondary education, 12 years; university first stage, 15 years; university second stage or doctorate studies, 17 years for university second stage and 19 years for doctorates.

3. ENS97 provides a typology of drinker which allows individuals to be classified into four categories according to the quantity of alcohol consumed: light drinker (1 to 175 cubic centimetres of pure alcohol per week); moderate drinker (176 to 525 c.c. of pure alcohol per week); heavy drinker (526 to 700 c.c. of pure alcohol per week); excessive drinker (more than 700 c.c. of pure alcohol per week).
4. In all the tables of results only variables are shown in which at least one category is significant (except for the income variable, which is always considered in order to isolate the non-monetary effects of education from the monetary ones). With regard to the statistics presented, the chi-squared test permits the conclusion that the model proposed is significant and, although the value of R^2 is not high (almost 0.30), it is in accordance with the usual values in this type of study –see Sander (1995a, 1995b); Ross & Wu (1995)–; neither are there any problems of multicollinearity or heteroscedasticity. These statistical appraisals are applicable to all the results presented.

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