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Academic performance and social factors related to cigarette smoking by schoolchildren

BEULAH R. BEWLEY AND J. M. BLAND*

From the Department of Community Medicine, St Thomas's Hospital Medical School

SUMMARY Factors which may influence boys and girls aged between 10 and 12½ years to start smoking were studied. Information was obtained from 491 schoolchildren, their parents, and headteachers. In their own view and that of their headteachers children who did not smoke were academically better than smokers. Children who smoked were more likely than non-smokers to have a parent and siblings of the same sex who smoked. No association was found between the child's own smoking and that of parents and siblings of the opposite sex. Smokers were more likely to have friends who smoked. Most children did not think smoking was enjoyable or desirable and many thought it bad for health, irrespective of their own smoking habits. The majority thought people of their own age smoked to show off.

Despite years of research into cigarette smoking and propaganda against it, many adults continue to smoke, and more young people take up the habit every year (Royal College of Physicians, 1971; Todd, 1972).

Several British studies have examined the background to smoking in children (Public Health Department Study Group, 1959; Cartwright and Thomson, 1960; McKennell and Thomas, 1967; Bynner, 1969) and it would seem that it is associated with a number of factors. These include smoking by parents, siblings, and friends, anticipation of adulthood, low academic achievement, attending secondary modern school, having parents from social classes IV and V, and living in an urban environment. However, they may be discouraged from smoking by health education, parental example, and sanctions.

To find out more about why young children take up smoking two studies have been carried out. In the first, Bewley *et al.* (1974) studied 229 Derbyshire boys in their final year at primary school. The study sought to find any relationship between the boys' smoking and that of their parents, siblings, and friends, the boys' own attitudes to smoking, and the reasons why they thought children smoked. In the current study smoking habits of boys and girls are compared, and academic performance related to smoking, parents' attitude to smoking, and the repeatability of the previous findings are investigated.

*Present address: Department of Clinical Epidemiology and Social Medicine, St George's Hospital Medical School, London

Method

In November 1971, 4804 children aged between 10 and 12½ years, in the final year of primary school or the first year of secondary school in Kent completed a short self-administered questionnaire on their smoking habits and respiratory symptoms (Bewley and Bland, 1976). The children were classified into four groups: heavy smokers, smoking one or more cigarettes a day; light smokers, smoking one or more a week; experimental smokers, who had smoked but were currently smoking less than one cigarette a week; and non-smokers, who had never smoked. A sample of 501 children, stratified by amount smoked, was selected for further study. All the heavy smokers found in the first stage were included, and a further group of light smokers chosen at random. These 167 smokers were then matched for sex, school class, and age (within six months) with 167 experimental smokers and 167 non-smokers, chosen at random. In June 1972, these children were asked to complete a second, more detailed, questionnaire at school under the direction of five trained health visitors. Each child was asked about his own smoking habits and those of family and friends, details about his first cigarette, beliefs about why children do or do not smoke, and his attitude to smoking and health. At the same time, the headteacher in the school was asked to rate each child's school work as good, average, or poor compared with other children in the class. Neither the headteacher nor the health visitor was told which children smoked.

In August 1972, the parents of these children were sent a self-administered questionnaire requesting information on the child's past respiratory illnesses and symptoms, parents' occupation, smoking habits, and attitude to children's smoking. Parents who failed to reply after two follow-up postal questionnaires were visited by one of the health visitors.

Results

RESPONSE RATES AND CONSISTENCY

Questionnaires were completed by 491 children (98% response rate) and 450 parents (92% response rate).

In both questionnaires the children were asked about their smoking, and 63% remained in the same category. As some change in smoking could be expected over the seven-month period between the first and second questionnaire the only reliable check of consistency was to consider those who, in November 1971, reported having smoked at least once. In June 1972, 92% of these again reported having smoked. The result will be reported here in terms of original classification.

Both children and parents were asked whether parents smoked. Of the parents who returned questionnaires, 90% confirmed the child's reply about their own smoking. The remaining 10% included cases where there was no father or mother. There were discrepancies in 49 cases where children reported that a parent smoked while the parent reported being a non-smoker, and in 13 cases where children reported a parent to be a non-smoker when the parents reported himself or herself as a smoker.

SMOKING BY PARENTS

Table 1 shows parents' smoking as reported by their children. The data from the parents showed the same pattern. Children were more likely to smoke if their parents smoked. Boys' smoking was related to their fathers' but not to their mothers' smoking. For girls, the association was with mothers' but not with fathers' smoking.

BROTHERS' AND SISTERS' SMOKING

Table 2 shows smoking by brothers as reported by the children. For boys, there was no relationship between having brothers and smoking, but there was a strong relationship between having brothers who smoked and the boys' own smoking. Forty-five per cent of boys who were heavy smokers had brothers who smoked, compared with 7% of non-smokers. There was little evidence for girls that the number of brothers or their smoking was associated with the girls' smoking.

The relationship with brothers' smoking could be a reflection of the influence of the fathers' smoking. Table 3 shows the smoking of both father and brothers related to the boys' own smoking. More smokers than non-smokers had brothers who smoked, both among boys whose fathers were non-smokers and boys whose fathers smoked. However, only among boys whose fathers smoked were there many smoking brothers. Although the brother appears to be an important influence, it is only likely to be so if the father smokes.

The smoking habits of sisters is shown in Table 4. For the boys, smoking by sisters was significantly associated with their own smoking; but 54% of boys with a sister who smoked also had a brother who smoked, compared with 16% of boys with no

Table 1 *Smoking by parents (as reported by the children)*

Questionnaire	*Parents' smoking*	*Smokers*				*Experimental smokers*		*Non-smokers*		*Total*		*Test of significance**
		Heavy		*Light*								
		No.	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	*No.*	*%*	
Boys	Father											
	smokes	25	80·6	65	75·6	89	72·4	71	57·7	250	68·9	$\chi^2 = 11{\cdot}64$, df = 3
	non-smoker	6	19·4	21	24·4	34	27·6	52	42·3	113	31·1	$P > 0{\cdot}05$
	Mother											
	smokes	17	54·8	45	52·3	62	50·4	60	48·8	184	50·7	$\chi^8 = 0{\cdot}49$, df = 3
	non-smoker	14	45·2	41	47·7	61	49·6	63	51·2	179	49·3	$P > 0{\cdot}50$
		31	100·0	86	100·0	123	100·0	123	100·0	363	100·0	
Girls	Father											
	smokes	1	50·0	23	57·5	22	51·2	23	53·5	69	53·9	$\chi^2 = 0{\cdot}21$, df = 2
	non-smoker	1	50·0	17	42·5	20	46·5	20	46·5	58	45·3	$P > 0{\cdot}50$
	Not known	0	00·0	0	00·0	1	2·3	0	00·0	1	0·8	
	Mother											
	smokes	1	50·0	29	72·5	22	51·2	16	37·2	68	53·1	$\chi^2 = 10{\cdot}04$, df = 2
	non-smoker	1	50·0	11	27·5	20	46·5	27	62·8	59	46·1	$P < 0{\cdot}01$
	Not known	0	00·0	0	00·0	1	2·3	0	00·0	1	0·8	
		2	100·0	40	100·0	43	100·0	43	100·0	128	100·0	

*Test for association between parents' and child's smoking. For the girls, heavy and light smokers were combined to give a 2 × 3 table.

Table 2 *Smoking habit of brothers*

	No. of brothers who smoke	Smokers: Heavy No.	Heavy %	Light No.	Light %	Experimental smokers No.	Experimental smokers %	Non-smokers No.	Non-smokers %	Total No.	Total %	Significance of association*
Boys	None	5	16·1	19	22·1	43	35·0	43	35·0	110	30·3	Boys with no brothers compared to boys with brothers but all non-smokers: $\chi^2 = 2·31$, df = 2, $0·25 < P < 0·50$
	One or more, but non-smokers	12	38·7	39	45·3	55	44·7	70	56·9	176	48·5	
	One or more, at least one smoker	14	45·2	28	32·6	25	20·3	9	7·3	76	20·9	Boys with either no brothers, or with brothers none of whom smoke, compared to boys with at least 1 brother who smokes: $\chi^2 = 29·34$, df = 2, $P < 0·001$
	Not known	0	00·0	0	00·0	0	00·0	1	0·8	1	0·3	
		31	100·0	86	100·0	123	100·0	123	100·0	363	100·0	
Girls	None	1	50·0	13	32·5	13	30·2	12	27·9	39	30·5	Girls with no brothers compared to girls with brothers but all non-smokers: $\chi^2 = 1·39$, df = 2, $0·25 < P < 0·50$
	One or more, but non-smokers	1	50·0	16	40·0	25	58·2	26	60·5	68	53·1	
	One or more, at least one smoker	0	00·0	11	27·5	4	9·3	5	11·6	20	15·6	Girls with either no brothers, or with brothers none of whom smoke, compared to girls with at least 1 brother who smokes: $\chi^2 = 5·23$, df = 2, $0·05 < P < 0·10$
	Not known	0	00·0	0	00·0	1	2·3	0	00·0	1	0·8	
		2	100·0	40	100·0	43	100·0	43	100·0	128	100·0	

*χ^2 for the whole table has been partitioned using the formulae of Kimball (1954). Heavy and light smokers have been combined to give a 3 × 3 table.

Table 3 *Relationship between boys' smoking habits and those of their fathers and brothers*

	Boys' smoking habits: Smoker	Experimental smoker	Non-smoker	Total
Father does not smoke				
No brothers who smoke	19	31	50	100
At least one brother who smokes	8	3	2	13
Father smokes				
No brothers who smoke	56	67	63	186
At least one brother who smokes	34	22	7	63
Not known	0	0	1	1
Total	117	123	123	363

sisters who smoked. Table 5 shows that for boys who had no brothers who smoked, there was no relationship between the boys' own smoking and that of their sisters. Conversely, when the boys were grouped by their sisters' smoking, there was a significant relationship between their own smoking and their brothers'. For the girls there was a significant association between their own and their sisters' smoking. There were insufficient girls in the study to enable the separate effect of mothers' and sisters' smoking to be investigated.

SMOKING BY FRIENDS

The children were asked how many of their friends smoked. Seventy-six per cent of children who were smokers reported that most or some of their school friends smoked, compared with 36% of non-smokers. The smokers reported that more of their friends smoked and were more certain about their friends' smoking than the non-smokers. More boys than girls said their friends smoked, and fewer girls knew how many of their friends smoked. Smoking reported for friends outside school showed a similar pattern.

THE FIRST CIGARETTE

Table 6 shows the age at which children tried their first cigarette. Sixteen per cent of the boys claimed this was at six or younger, so these figures should be treated with some caution. The boys were younger when they started smoking than the girls.

Home was the most common place for the first cigarette, especially for girls, and it was usually obtained from friends or family. More often this cigarette was smoked with friends than with parents or siblings or when alone, but 22% of children who had smoked said that their first cigarette was smoked with their parents.

REASONS FOR AND AGAINST SMOKING

The children were asked why they thought people of their own age did or did not smoke. They were asked to choose as many reasons as they wished from a list. There were only slight differences between answers from smokers and non-smokers, or from boys and girls.

The most frequent reason for smoking was 'they want to show off or look big', chosen by 62% of the children. 'To be grown up' was chosen by 8% of

Table 4 *No. of sisters who smoke*

	No. of sisters who smoke	Smokers: Heavy No.	Heavy %	Light No.	Light %	Experimental smokers No.	Experimental smokers %	Non-smokers No.	Non-smokers %	Total No.	Total %	Significance of association*
Boys	None	8	25·8	30	34·9	36	29·3	46	37·4	120	33·0	Boys with no sisters compared to boys with sisters but all non-smokers: $\chi^2 = 1·51$, df = 2, $0·25 < P < 0·50$
	One or more, but non-smokers	14	45·2	41	47·7	72	58·5	69	56·1	196	54·0	
	One or more, at least one smoker	9	29·0	15	17·4	15	12·2	7	5·7	46	12·7	Boys with either no sisters or with sisters none of whom smoke compared to boys with sisters at least 1 of whom smokes: $\chi^2 = 11·8$, df = 2, $P < 0·01$
	Not known	0	00·0	0	00·0	0	00·0	1	0·8	1	0·3	
		31	100·0	86	100·0	123	100·0	123	100·0	363	100·0	
Girls	None	0	00·0	12	30·0	18	41·9	22	51·1	52	40·6	Girls with no sisters compared to girls with sisters but all non-smokers: $\chi^2 = 1·85$, df = 2, $0·25 < P < 0·50$
	One or more, but non-smokers	2	100·0	18	45·0	19	44·2	19	44·2	58	45·3	
	One or more, at least one smoker	0	00·0	10	25·0	5	11·6	2	4·7	17	13·3	Girls with either no sisters or with sisters none of whom smoke compared to girls with sisters at least 1 of whom smokes: $\chi^2 = 6·85$, df = 2, $P < 0·05$
	Not known	0	00·0	0	00·0	1	2·3	0	00·0	1	0·8	
		2	100·0	40	100·0	43	100·0	43	100·0	128	100·0	

*χ^2 for the whole table has been partitioned using the formulae of Kimball (1954). Heavy and light smokers have been combined to give a 3 × 3 table.

Table 5 *Relationship between boys' smoking habits and those of their brothers and sisters*

	Boys' smoking habits: Smoker	Experimental smoker	Non-smoker	Total
No brothers who smoke				
No sisters who smoke	68	89	108	265
At least one sister who smokes	7	9	5	21
At least one brother who smokes				
No sisters who smoke	25	19	7	51
At least one sister who smokes	17	6	2	25
Not known	0	0	1	1

Table 6 *Factors associated with first cigarette, for all children who had tried smoking by stage 2*

First cigarette	Boys No.	Boys %	Girls No.	Girls %
Age (years)				
At six or less	43	16·0	6	7·2
seven	28	10·4	5	6·0
eight	39	14·5	5	6·0
nine	60	22·3	18	21·7
ten	59	21·9	30	36·2
eleven or more	33	12·3	19	22·9
Not known	7	2·6	0	00·0
Place				
At home	80	29·7	40	48·2
Elsewhere	183	68·1	43	51·8
Not known	6	2·2	0	00·0
Source				
From family	73	27·2	31	37·4
friend	131	48·7	31	37·4
other	59	21·9	21	25·3
Not known	6	2·2	0	0·0
Company				
Alone	34	12·7	8	9·6
With friends	130	48·3	31	37·4
brother or sister	35	13·0	14	16·9
parent	52	19·3	23	27·7
other	12	4·5	7	8·4
Not known	6	2·2	0	0·0
Total	269	100·0	83	100·0

the children. Fewer gave the example of others as a reason, 35% choosing 'Because their friends smoke' and 27% 'Because their parents smoke'. The children did not think the actual act of smoking was important, 'Because they like it' was chosen by 24% and 'They think it is relaxing' by 9%. Only 7% thought children smoked 'Because they are curious'.

The most common reason for not smoking was 'They are worried because smoking is bad for their health', which was chosen by 71% of the children. Pressure from adults was chosen next, 'Parents tell them not to' being chosen by 46% and 'They would get into trouble if they did' by 34%. Fewer children thought teachers were important, 'Teachers tell them not to' being chosen by 24%. 'It is expensive' was chosen by 36%, 'It is a dirty habit' by 30%, and 'It is a waste of time' by 23%. The children did not seem to think peer group pressure was as important, only 14% choosing 'Other children they know do not smoke'.

ATTITUDES TO SMOKING

The children were asked whether they agreed or disagreed with a number of statements on attitude. The results are shown in Table 7. As there was little difference in the replies of boys and girls, these have not been presented separately. Overall, 87%

Table 7 *No. of children agreeing with statements about smoking*

Statement	*Smokers*				*Experimental smokers*		*Non-smokers*		*Total*		*Association between attitude and smoking**	
	Heavy		*Light*									
	No.	%	*No.*	%	*No.*	%	*No.*	%	*No.*	%		
Smoking is bad for your health	31	93·9	107	84·9	151	91·0	158	95·2	447	91·0	9·6	$P < 0·05$
Smoking causes cancer	27	81·8	106	84·1	151	91·0	156	94·0	440	89·6	9·9	$P < 0·05$
Parents should try to stop their children from smoking	27	81·8	101	80·2	151	91·0	154	92·8	433	88·2	13·7	$P < 0·01$
It is a bad idea for children to smoke	24	72·7	100	79·4	147	88·6	158	95·2	429	87·4	23·1	$P < 0·001$
Smoking is a waste of money	28	84·8	86	68·3	139	83·7	147	88·6	400	81·5	20·9	$P < 0·001$
People of my age smoke to show off	23	69·7	82	65·1	133	80·1	150	90·4	388	79·0	29·5	$P < 0·001$
Smoking makes you feel grown up	10	30·3	55	43·7	64	38·6	64	38·6	193	39·3	2·2	$0·5 < P < 0·7$
It is nice to smoke with your friends	16	48·5	54	42·9	48	28·9	23	13·9	141	28·7	36·5	$P < 0·001$
Smoking is enjoyable	12	36·4	44	34·9	28	16·9	11	6·6	95	19·3	43·6	$P < 0·001$
Total	33	100·0	126	100·0	166	100·0	166	100·0	491	100·0		

*χ^2 or 3 degrees of freedom.

Table 8 *Child's assessment of own schoolwork*

	Assessment	*Smokers*				*Experimental smokers*		*Non-smokers*		*Total*		*Significance**
		Heavy		*Light*								
		No.	%	*No.*	%	*No.*	%	*No.*	%	*No.*	%	
Boys	Good	7	22·6	17	19·8	46	37·4	41	33·3	111	30·6	$\chi^2 = 8·8$, df = 3
	Average	21	67·7	64	74·4	74	60·2	74	60·2	233	64·2	$P < 0·05$
	Poor	3	9·7	5	5·8	3	2·4	8	6·5	19	5·2	
		31	100·0	86	100·0	123	100·0	123	100·0	363	100·0	
Girls	Good	—	—	6	15·0	10	23·3	10	23·3	26	20·3	$\chi^2 = 1·27$, df = 2
	Average	2	100·0	27	67·5	32	74·4	32	74·4	93	72·6	$P < 0·50$
	Poor	—	—	6	15·0	1	2·3	1	2·3	8	6·3	
	Not known	—	—	1	2·5	—	—	—	—	1	0·8	
		2	100·0	40	100·0	43	100·0	43	100·0	128	100·0	

*Test for association between child's assessment and smoking. The poor and average categories have been combined, and for the girls so have heavy and light smokers.

of the children thought it was a bad idea for children to smoke. Significantly more non-smokers than smokers agreed with this, but 73% of heavy smokers also agreed. Most children agreed that smoking was a waste of money, and that parents should discourage their children from smoking. Nearly all the children thought that smoking was bad for health and that it caused cancer.

Significantly more non-smokers agreed that 'People of my age smoke to show off'. When asked to agree or disagree with the statement 'Smoking makes you feel grown up', there was no difference between the smoking groups.

More smokers than non-smokers thought that it was nice to smoke with friends, and half the heavy smokers agreed with this. Overall, 20% thought smoking was enjoyable; this was agreed by more smokers than non-smokers although fewer than half the children in any group said this.

ASSESSMENT OF SCHOOL WORK

The children were asked if they thought their school work was good, average, or poor compared with other members of their class. Table 8 shows that most of the children saw their work as good or average; significantly more boys than girls saw their work as good. More non-smokers and experimental smokers said their work was good compared with the smokers; this difference was significant for boys.

The headteachers were asked to classify the children's work using the same criteria. They placed about one-third of the children in each category. As few children rated themselves as poor, these two classifications were not the same. However, they were related, in that children whom the head saw as good tended to see themselves as good, and children who saw themselves as poor were also seen as poor by their headteachers.

Table 9 *Headteacher's assessment of schoolwork*

	Assessment	*Smokers*				*Experimental smokers*		*Non-smokers*		*Total*		*Significance**
		Heavy		*Light*								
		No.	%	*No.*	%	*No.*	%	*No.*	%	*No.*	%	
Boys	Good	1	3·2	17	19·8	31	25·2	30	24·4	79	27·8	$\chi^2 = 10{\cdot}67$, df = 6
	Average	13	41·9	27	31·4	44	35·8	43	35·0	127	35·0	$0{\cdot}05 < P < 0{\cdot}01$
	Poor	15	48·4	32	37·2	35	28·5	35	28·5	117	32·2	
	Not known	2	6·5	10	11·6	13	10·6	15	12·2	40	11·0	
		31	100·0	86	100·0	123	100·0	123	100·0	363	100·0	
Girls	Good	—	—	3	7·5	11	25·6	15	34·9	29	22·7	$\chi^2 = 12{\cdot}12$, df = 4
	Average	2	100·0	18	45·0	21	48·8	19	44·2	60	46·9	$P < 0{\cdot}05$
	Poor	—	—	16	40·0	9	20·9	7	16·3	32	25·0	
	Not known	—	—	3	7·5	2	4·7	2	4·7	7	5·5	
		2	100·0	40	100·0	43	100·0	43	100·0	128	100·0	

*Test for association between headteacher's assessment and child's smoking. Not knowns have been omitted and for girls heavy and light smokers have been combined.

The relationship between the headteacher's assessment and the child's smoking is shown in Table 9. Again, more non-smokers than smokers were good and more smokers than non-smokers were poor.

Discussion

We have examined some of the characteristics of children aged between 10 and 12½, some of whom were already smoking. The findings are important because of the age of the subjects.

The young smoker was more likely than the non-smoker to come from a home where there were smokers of the same sex as the child. Smoking by parents and brothers and sisters of the opposite sex did not seem to be strongly related to the child's smoking. The influence of parents' smoking has been well documented (Public Health Department Study Group, 1959; Cartwright and Thomson, 1960; Salber *et al.*, 1968; Palmer, 1970). An association between boys' smoking and fathers' smoking was also found by O'Rourke and Wilson-Davies (1970) and Bewley *et al.* (1974), but not by Bynner (1969). No association between boys' smoking and their mothers' smoking was found in Derbyshire (Bewley *et al.*, 1974), although other workers have reported that the mothers' smoking was important (Bothwell, 1959; Lemin, 1966). The importance of the father and lack of influence of the mother found for boys in this study was not true for girls, the opposite being the case. It would seem that the smoking habits of the parent of the same sex as the child is important in this age group.

The association between boys' smoking and their brothers' has been reported (Lemin, 1966; Bynner, 1969; Bewley *et al.*, 1974). This study confirms these findings. This effect mainly occurs when the father also smokes. Bynner (1969) did not distinguish between brothers and sisters, but in this study sisters have been shown to have little effect on boys' smoking compared with their brothers. On the other hand, for the girls the smoking of their sisters rather than of their brothers was the important factor. The sibling of the same sex would appear to have the greater influence on the children in our study.

The young smoker was more likely to say that his friends smoked, and this agrees with previous findings (Bynner, 1969; Bewley *et al.*, 1974).

The academic achievement of smokers was lower than that of non-smokers, both as seen by themselves and by their headteachers. Fewer children thought their work was poor in contrast to the headteachers, who assessed one-third as poor. Girls generally ranked themselves lower than boys. These children are younger than many other groups that have been studied, but some of our findings support studies of older children (Hargreaves, 1967; National Health and Medical Research Council, 1969; Newman *et al.*, 1970; Laoye *et al.*, 1972) where children graded higher in academic ability smoked less.

The main reason for smoking in the children's view was to show off. None of the other reasons suggested was agreed by more than half the children, and curiosity was rarely mentioned. The children did not seem to enjoy smoking. Few of them agreed that smoking was enjoyable, and few thought children smoked because they like it. They did not think smoking was a desirable activity for children, and they also thought parents should discourage their children from taking it up. Most of the children in each group thought smoking was harmful to health, and they also thought that health worries were a deterrent. However, these views were held by fewer smokers than non-smokers.

The negative attitude of both boys and girls to smoking was also found in our previous study of primary school boys (Bewley *et al.*, 1974). This does not conform with the findings of Bynner (1969) who

reported that most of the smokers in his sample enjoyed smoking. This could be an age effect as the boys in Bynner's sample were older. The findings of Bland *et al.* (1975) suggest that boys between 10 and 12½ years do not identify themselves with smokers, despite their own smoking habits, and this may account for some of the discrepancies between attitudes and behaviour.

There was no evidence of a relationship between smoking and social class. Bynner (1969) found the same. McKennell and Thomas (1967) found that regular smoking for adolescents began earlier among social classes IV and V, than among I and II. Most of the children in our study came from social class III, so it would be difficult to detect any but large differences in the social class distribution with our smoking groups.

The study shows that starting to smoke at an early age is mainly a result of social factors. Children experiment with cigarettes and begin regular smoking despite being aware of the health hazards. Clearly, health education will have to take these social factors into account, but the problem is complicated as reasons for beginning to smoke vary for different groups of children. Anti-smoking education ought to be directed at children who are more at risk. If this is to be done, we need as clear a picture as possible of how and why children take up smoking. We hope that these findings add to this, and that with further work a better understanding of children's smoking will help health educators to discourage children from taking up the habit.

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Reprints from B. R. Bewley, Department of Community Medicine, St Thomas's Hospital Medical School, London SE1 7EH.

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