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PERSONALITY DIFFERENCES WITHIN FAMILIES: COMPARISON OF ADULT BROTHERS AND SISTERS

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Summary. 313 pairs of brothers and 296 pairs of sisters were compared by one or both parents in a postal questionnaire. For 495 pairs independent questionnaires were completed by father and mother, and agreement between parents was good.

There was a marked tendency for the first-born child to be rated as less fond of cuddling; he was also easier to train, worked harder at school, set himself higher standards, and was more serious, methodical, law-abiding, tidy and less impulsive; he learned to talk and read at a younger age and was rated as having more natural ability at schoolwork. These three groups of first-born attributes were relatively independent; for instance, even the first-born with less ability at schoolwork were given more responsibility at school. In the 152 pairs which did not contain a first-born, little birth order effect could be found, whether or not the elder was the eldest of his or her sex.

There was a slight tendency for the broader, fatter and more muscular child to be less nervous and highly strung, but otherwise differences in physique were not related to differences in behaviour. Abilities at schoolwork, games, music and painting were not related. Tendency to anxiety and depression was related to lack of sociability; to stubbornness and lack of practicality; to angryness but not the bottling up of anger; to level of aspiration but not the possession of abilities or good looks. These relations of anxiety and depression in a normal sample closely parallel the items which distinguish psychiatric patients from their healthy siblings.

Introduction

Long before methods for partitioning variance were developed, it was well known that a good proportion of human personality variation can be seen within families. Large differences may occur even between twins of the same sex, and the differences

appear not to get less under the influence of similar environmental conditions. In pointing out this surprising fact in 1883, Francis Galton quotes some reports he had collected from parents of twins, of which the following is not atypical: 'They have had exactly the same nurture from their birth up to the present time; they are both perfectly healthy and strong, yet they are otherwise as dissimilar as two boys could be, physically, mentally, and in their emotional nature.'

William James (1897) was also impressed by these differences: '. . . we are forced to believe that two children of the same parents are made to differ from each other by causes as disproportionate to their ultimate effects as is the famous pebble on the Rocky Mountain crest, which separates two rain-drops, to the Gulf of St Lawrence and the Pacific Ocean towards which it makes them severally flow.'

Apart from the causes of the intra-pair differences, there are still several purely descriptive aspects of family variation which have not yet been entirely elucidated. To what extent, for instance, are differences at one stage of development predictive of differences at another? Are differences in one area, such as physique, related to differences in another area, such as personality? And within the field of personality, to what extent are the various differences related to each other?

These questions are particularly tantalizing because everyone has information from his own personal experience which is relevant to the answers. Parents, in particular, have a very extensive knowledge of their own children and of differences between them. But in the case of no one person is the number of independent observations sufficiently large to provide a reliable answer. Clearly, however, if parents join together and pool their observations, the situation is very different and reliable answers are easily obtained. The purpose of the present work was to enable parents to carry out this pooling of information.

Method

Selection of families

Letters were published in *The Eugenics Review*, *Humanist News*, the *Newsletter of the Educational Psychologists' Association* and the *Observer*, outlining the project and asking for volunteers from parents who had at least two children of the same sex over the age of 18. Other parents were approached through friends, and a further group at a symposium organized by the Eugenics Society. Altogether, 723 parents volunteered. Fifty-three of the parents offered to answer for two pairs of children, so that questionnaires were distributed for 776 pairs of children. Replies were received for 672 of the 776 pairs (86·6%). Thirty-one of these pairs were identical twins (probably), and these were reserved for a separate analysis; the 33 pairs of fraternal twins were included in the main body of the data. In a further 32 cases one of the pair had suffered from an illness sufficiently severe to have affected many of the within-pair differences. These were excluded from the main analysis, although data on 26 of these pairs, in which the illness was some form of mental breakdown,

will be presented together with some additional data on psychiatric patients. Thus 609 pairs were available for the main analysis, comprising 313 pairs of sons and 296 pairs of daughters. The sex equality is of some interest in itself, suggesting that parents are equally interested in providing observations of sons and of daughters.

No information was requested about the parents themselves. The age range of the children was 18 to 44, but the great majority were under 35. The median age of the elder children was 25 years 2 months and of the younger children 22 years 4 months. In 67 of the 609 pairs, the members were separated by a sibling of the other sex. Some details of family size and ordinal position are given with the results relating to birth order. The occupational status of the 626 sons is given in Table 1.

Table 1. Occupations of the 626 sons

Occupation	No.
Still at school	14
University and training college (undergraduate and post-graduate students)	187
Teaching: school	40
university	23
Scientific research	33
Medicine	22
Accountancy	16
Engineering	34
Church	11
Other professions	59
Managers or trainee managers in commerce or industry	64
Clerks, salesmen, technicians	92
Manual labourers	12
Self-employed	12
Unemployed or 'knocking about abroad'	7

In some pairs the two had similar occupations; in one instance both were trainee average adjusters. In most pairs the occupations were different and, in some, widely separated according to the Registrar General's classification; in one instance the elder, aged 33, was a civil engineering consultant to a nationalized industry while the younger, aged 31, was a dishwasher for a steamship company. On the whole, however, it can be seen to be an upper-middle-class sample.

Both sisters were single in 190 pairs and both brothers in 236 pairs (at the present age of the younger).

The questionnaire

The parents were asked to compare two children of the same sex over the age of 18 (the two youngest over 18 if there were more than two, or their same-sexed twins

if there were such). Evidently the parents' observations had to be collected in a standardized way, and since no suitable instrument was available, the questionnaire given in the Appendix was constructed. The items were derived partly from previous work on personality, and partly from a series of interviews with parents about differences between their children. For each of 90 items, the parents had a choice of three responses; they could indicate that the item applied more to the elder of the pair or to the younger of the pair, or that they were unable to say that there had been a consistent difference between the two. They were not asked to assess the position of the children in relation to any norm or general population standard. Nor were they asked to estimate the size of the difference.

Two copies of the 90-item questionnaire were sent for each pair of children. A covering letter asked the mother and father to fill in their copies independently, and explained that the purpose of this duplication was to assess the reliability of the different items, and not to check up on the accuracy of the parents themselves. In addition, the parents were encouraged to add further comments about differences between their children, particularly about the stability or otherwise of differences over time.

The letter and the two copies of the questionnaire were accompanied by a single inventory relating to birth order, family size, schooling, and similar factual matters, from which a further 10 items of comparison between the children could be extracted (listed in Appendix). A stamped, addressed envelope was included for the replies.

Scoring and analysis

The manipulation of data based on 100 items may lead to a very large number of comparisons and correlations, particularly when the data are subdivided by age, sex, marital status, birth order and similar variables. Thus a large number of technically significant results are to be expected by chance. The results to be presented can only be evaluated correctly if all the comparisons and correlations which have been made are clearly stated, and therefore at the risk of being pedestrian I shall recapitulate the exact way in which the data were scored and analysed.

For simplicity, and at the cost of not being able to give mother/father correlations for each item, the scores of mother and father were combined before being transferred to punched cards. When both mother and father scored the centre column (indicating 'no difference' or 'don't know') a score of 3 was allocated. When one parent scored the centre column and the other either the left- or the right-hand column (indicating the elder or younger respectively) a score of 4 or 2, respectively, was given. When both parents scored either the right- or left-hand column, the score was taken as 5 or 1 respectively. Thus a rough 5-point scale was derived, ranging from 1, when both parents agreed the item applied to the younger, to 5 when both agreed it applied to the elder.

When the parents disagreed on an item, one scoring the left-hand column and

the other the right, an arbitrary score of 9 was allocated. Nines were converted to 3 (no difference) for all calculations except those concerning reliability.

For 114 pairs only one questionnaire was received. In most of these a 3-point scale had to be used, but in 37 cases the parent made a separate mark for particularly large differences, and these were scored as if two parents had agreed on the item.

The 10 items extracted from the inventory were scored on 3- or 5-point scales, depending on the nature of the item. Thus age at menarche was scored 2 or 4 when there was a difference of a year or less, and 1 or 5 when the difference was greater than a year. Age, family size and the position of the two children in the family (first, last or in the middle, and whether older and younger children were same or other sex) were also recorded, together with information about twinship.

Three computer analyses were obtained from the punched cards, in each case separately for the two sexes:

1. A frequency count of the 100 items for all pairs, to assess response bias and birth order effects.

2. A frequency count of the 90 questionnaire items for the pairs for which two independent questionnaires were received. This gave an item analysis of parental agreement.

3. A correlation matrix of the 100 items for all pairs. The programme calculated a Pearson–product moment correlation coefficient; the same programme also happened to give an unrotated principal component analysis, but this will receive only brief mention as the main interest lies in the correlation of the individual items.

The two correlation matrices themselves are unfortunately too large to present in print, and therefore there must be a certain selection in choice of items. On the whole the policy has been to consider only correlations of 0·2 or above (these are well beyond the 1 % level of significance) and to present all correlations at this level for each item under consideration, unless otherwise indicated. Since the two matrices contain 4950 correlation coefficients each, quite a number can be expected to be technically significant by chance; therefore not much interest attaches to the isolated significant correlation. In fact this problem does not arise to any extent, as in all the cases to be presented the significant correlations show a meaningful pattern and there is good agreement between the sexes.

Results

Between-parent reliability

Questionnaires were completed by both parents (or, in a few cases, by one parent and a close relative or friend) for 495 pairs. On average, both parents selected one or other child on 43·0 of the 90 items; they agreed on 38·6 items and disagreed on 4·4 items.

The degree of agreement between parents was calculated separately for each item, and was based on the number of pairs, in most cases between 200 and 300, in which

both parents had selected one or other child. Unless there is some systematic bias towards one child or another (such as a birth order effect) the chances of either child being chosen are 50%; thus, if the father chooses the elder on any item, we would expect the mother to agree by chance 50% of the time. The measure of reliability is the deviation of this agreement from 50%.

There was a significant deviation from 50% for each item in the case of sons and daughters separately. The range of variation in agreement was quite large, depending on the nature of the item. In only one case was there 100% agreement; for 'has been more of a cigarette smoker' in the case of daughters, all 93 parents who both selected

Table 2. Distribution of items according to percentage agreement between parents

Percentage agreement	No. of items	
	Sons	Daughters
96–100	22	8
91–96	33	30
86–90	23	24
81–85	10	18
76–80	1	8
71–75	1	2

one or the other agreed on which one it was; for smoking in sons there were 3 disagreements and 109 agreements. In both sexes there was least agreement on 'more liable to be upset when told off or criticized': being 74% (101 agreements out of 137) for daughters and 71% (99 out of 141) for sons. The distribution of items according to parental agreement can be seen in Table 2. Agreement was rather better for sons than for daughters.

Birth order effects

The questionnaire was so designed that a mark in the left-hand column indicated the elder child, and one in the right-hand column the younger. Before considering the possibility of a birth order effect, it was first necessary to exclude a response bias; that is, a tendency to score one column more than the other. In fact, the two columns were equally used, as can be seen by comparing the number of items in which more elder children were scored with the number of items in which more younger children were scored. Ninety items for sons and daughters separately give 180 items, distributed as follows:

Items in which more elder children scored	93
Items in which more younger children scored	85
Items in which elder and younger scored equally	2
Total	180

If N is the number of pairs for any item in which one or both parents indicate one or other child (that is, they do not both say 'no difference' or disagree) and E is the number of pairs in which the child indicated is the elder, then, in the absence of response bias or birth order effect, the proportion E/N should vary around a mean of 0·5 with a standard error of $\sqrt{(0{\cdot}5N)}$.

Examination of the proportions E/N on the total frequency counts for sons and daughters revealed two things clearly: first, the scatter of proportions was greater than would be expected by chance, which in the absence of a response bias indicated a birth order effect; and secondly, the deviations were very similar for the two sexes on all the items which showed more than a random deviation. Therefore it appeared appropriate to carry out a more detailed analysis of birth order effect. In view of the similarity of deviations for sons and daughters, the two sexes were combined for this further analysis, in order to provide larger numbers in the sub-categories. The 44 pairs in which one or both members of the pair were twins were excluded. For theoretical reasons, and because of the findings of previous workers, the analysis was concentrated on the family positions of eldest and youngest.

The four sub-categories studied were as follows:

1. 229 pairs in which the elder was first-born and the younger last-born. Of these, 185 were from sibships of two.
2. 183 pairs in which the elder was first-born and the younger not last-born.
3. 98 pairs in which the elder was not first-born and the younger was last-born.
4. 55 pairs in which the elder was not first-born and the younger was not last-born.

Examination of the items divided into these four categories revealed some very clear consistencies in the data. The deviations from expectation were virtually confined to the first two categories; that is, deviations were only present when a first-born was present in the comparison. Moreover, it did not matter whether the first-born was being compared with a last-born or with a sibling from an intermediate position. In the small number in which there was no first-born or last-born, no birth order effect at all was discernible, and in the case of category 3 the deviations were so slight that they would have passed unnoticed, were it not for the fact that in many cases they involved the same items, and were in the same direction, as the deviations in categories 1 and 2. Thus it can be stated that the birth order effects in the present data are virtually confined to the first-born position, and that there is no characteristic last-born effect.

Of the 87 items which were identical for sons and daughters, 15 deviated beyond the one in a thousand level of probability, and a further 3 beyond the one in a hundred level, in those comparisons involving a first-born. The figures for these items are given in Table 3, with the corresponding figures for pairs not containing a first-born. The remaining data on the 412 pairs containing a first-born are given in the Appendix.

Can any 'first born effect' be seen in the first born sons who have older sisters

and in the first-born daughters who have older brothers? In order to test this possibility, the 153 pairs in whom the elder was not first-born were divided into 74 pairs in which the elder was the oldest of his or her sex, and 79 pairs in which the elder of the pair had an older sibling of the same sex, and the distributions of scores on the

Table 3. The influence of the first-born position

Item	No. of pairs in which one or other child indicated			
	First-born compared with another		Pairs in which neither first-born	
	Elder	Younger	Elder	Younger
More natural ability at schoolwork	206	129	61	59
Worked harder at his schoolwork	203	129	66	59
Given more responsibility at school	180	113	72	46
Learned to talk at a younger age	183	112	45	37
Quicker at learning to read	197	100	48	44
Fonder of cuddling and similar contact	77	232	45	58
Easier to train to avoid traffic, etc.	141	64	34	39
Heavier at birth	131	224	67	67
More difficult birth	228	58	42	43
Kept his clothes and other things tidier	193	124	56	65
Sets himself higher standards	198	114	63	51
More impulsive, liable to do things on the spur of the moment	134	204	65	55
More serious in his nature	208	102	64	59
More regular and methodical in his habits	209	136	64	61
More law-abiding, tends to obey rules	183	105	60	49
A happier, more optimistic disposition	136	194	65	57
More nervous and highly strung	191	134	58	64
Spends more time in social activities	120	173	53	66

15 items mentioned above were studied. Although the numbers in each cell were not large (about 30) it was clear that the sex of the older sibling made no difference at all.

Intercorrelation of the items

The correlations were on the whole low, compared with the level usually found in self-report inventories. The highest was between 'broader in relation to her height' and 'more tendency to put on fat' (0·751 in daughters and 0·627 in sons). Correlations over 0·6 were found between similar items in the general areas of mood, sociability and obedience to parents.

In the unrotated principal component analysis, the first component accounted for just over 10% of the variance in both sexes. In the case of the sons, this component appeared to tap an outgoing and dominant/withdrawn and submissive dimension; whereas in the daughters it was more of an easy-to-get-on-with/disobedient and critical dimension. But whether this represents a sex difference in variation, or a difference in the way parents regard sons and daughters, it is of course impossible to tell.

Probably the most interesting aspects of the correlations are the negative ones. Abilities at schoolwork, games, music and painting appear to be unrelated to each other. The various items reflecting happiness and good adjustment are unrelated to the possession of these various abilities or to the possession of an attractive appearance. These and other aspects of the intercorrelations are described in more detail in the following sections.

Physique and behaviour

There was remarkably little association between the physical development items and the items relating to behaviour. All such correlations of 0·2 or over are shown in Table 4.

'Heavier at birth' had no correlations with behaviour items in either sex, and only low correlations with the other physique items (see Table 5). 'More difficult birth' is not a precise item and it is perhaps not surprising that there were no correlations at the 0·2 level with any other item in either sex.

On the other hand, 'taller when fully grown' is unambiguous and showed excellent agreement between parents. Yet here again there was no correlation of 0·2 with any other item in either sex. There were two correlations above 0·15 with behaviour items; namely, with longer schooling in daughters and 'drinks less alcohol' in sons but these are well within the range of random variation.

The items for breadth, muscularity and fat all have low but consistent negative correlations with 'more nervous and highly strung', but are not related to any of the other questions about anxiety or depression. Muscularity is related to games ability and to 'more energetic' in both sexes.

Age at menarche had no correlations above 0·15 with any other item. For sons, 'voice broke and started shaving at a younger age' was clearly a difficult question to answer; its only correlations were 0·231 with 'more muscular' and 0·217 with 'more robust physical health'.

'More attractive appearance' for sons and 'more attractive looks and figure' for daughters were related to taking trouble about appearance, and to seeking girls and being sought after by boys in the case of sons and daughters respectively. But there were no other correlations of 0·2 or more in either sex.

Milestones

From Table 6 it can be seen that the milestones are all positively correlated, as

Table 4. Relation of physique to behaviour

Physique item	Behaviour item	Correlation coefficient Sons	Daughters
Heavier at birth	Nil		
More difficult birth	Nil		
Taller (when fully grown)	Nil		
More muscular (when fully grown)	Better at games and athletics	361	386
	More energetic	307	291
	More nervous and highly strung	–277	–216
	A stronger, more forceful personality	133	281
	More practical, less of an idealist	266	184
	Spends more time in hobbies such as carpentry (sons) or dressmaking (daughters)	260	–040
	More persistent in doing something that interests him	034	203
Broader in relation to his height	Took more trouble about his appearance	–061	–214
	More nervous and highly strung	–277	–266
More tendency to put on fat	Fonder of cuddling and similar contact	058	334
	More affectionate to parents	—	210
	Took more trouble about his appearance	050	–209
	Laughs more	021	232
	More nervous and highly strung	–223	–184
More attractive appearance	More sought after by boyfriends	—	512
	More active in seeking girlfriends	210	—
	Took more trouble about his appearance	270	412

Where either sex has a correlation of 0·2 or over, the correlations for both sexes are shown. The blanks are items which occur in the questionnaire for one sex only. *In this and subsequent tables the decimal points have been omitted from the correlation coefficients.*

Table 5. Interrelation of the physique items

Physique item	Heavier at birth	Taller	More muscular	Broader	More tendency to fat	Better co-ordination
SONS						
Taller	075					
More muscular	162	053				
Broader	187	–178	575			
More tendency to fat	227	–182	282	627		
Better co-ordination	–102	–039	165	–014	–131	
More attractive appearance	087	087	171	117	097	212
DAUGHTERS						
Taller	155					
More muscular	112	169				
Broader	133	–153	370			
More tendency to fat	147	094	325	751		
More graceful movements	–169	–069	–261	–416	–381	
More attractive looks and figure	–035	028	–121	–304	–215	531

one might expect. The correlations are uniformly higher for boys, perhaps reflecting the greater parental agreement in the case of boys.

The correlations are greatest for the milestones which are chronologically closest, and the relation between reading and walking is small. Early reading may be a good predictor of 'natural ability at schoolwork', correlating just over 0·5 with the latter item in both sexes.

Table 6. Intercorrelation of milestones and ability at schoolwork

Childhood item	Walking	Talking	Reading
SONS			
Talked younger	341		
Quicker at learning to read	139	417	
More natural ability at schoolwork	121	228	545
DAUGHTERS			
Talked younger	218		
Quicker at learning to read	082	303	
More natural ability at schoolwork	034	113	524

Talking has no other correlations over 0·2. Nor has walking for girls, but in boys it correlates 0·207 with activity in seeking girl friends in the 'teens. In both sexes the quicker readers have longer schooling and read more in adult life; in girls the quicker readers spend more time on their own (0·365) and are less fond of cuddling (0·227) and more serious in their natures (0·200), but these relations are negligible for boys, nor are there any other correlations of 0·2 or above.

Abilities

Those with more natural ability at schoolwork tended in later life to be more interested in world events (over 0·2 for both sexes) and the girls were more serious-minded, but there was no relation to any of the items concerning mood, emotional adjustment or methodicalness.

For girls, ability at music or painting had no correlations as high as 0·2. For boys, those good at music tended to be less muscular, energetic and practical (just over 0·2 in each case). Boys good at painting tended to spend time in 'hobbies such as carpentry', which could of course include painting. There were no other correlations of 0·2 or over.

In both sexes, those who were better at games were more muscular, had more friends at school and spent less time on their own, enjoyed school more and were given more responsibility there. These are the sort of relations one would expect. There were no correlations with other abilities, or milestones, or any items

concerning adjustment, except that in their 'teens boys who were better at games were more active in seeking girl friends (0·301), were less shy with girls (0·234) and took the lead more with their friends (0·230). For girls, ability at games had no predictive power after schooldays except for being energetic (0·447) which also applied to boys (0·361).

Anxiety and depression items

The items reflecting a tendency to anxiety and depression when grown up all showed moderate intercorrelations, varying between 0·4 and 0·7; there was not much distinction between the tendencies to anxiety and depression. Anxiety and depression were positively related to getting angry and being critical of others, but

Table 7. Relation of childhood neurotic traits to 11 adult anxiety/depression items

Childhood item	No. of correlations of 0·2 or more with adult anxiety/depression items	
	Sons	Daughters
Worried more about exams	4	0
More frightened of the dark	0	4
More nightmares or night terrors	1	4
Cried more or for longer periods	2	8
More fussy about his food	2	—
Sucked thumb to a later age	—	0

not to speaking out when angry. The other main relations of the anxiety/depression items were with sociability and with the 2 items expressing a down-to-earth, feet-on-the-ground character; namely, 'more realistic in the goals he sets himself' and 'more practical, less of an idealist'; these correlations were negative and in the 0·2–0·3 range. For daughters, the one who 'set herself higher standards' was also the one most liable to anxiety and depression, the correlations being consistent and in the 0·2–0·3 range; but for sons, these correlations were all close to zero. In neither sex was 'ambition to make a career for himself' related to the anxiety/depression items.

There were no correlations between the anxiety and depression items and any of the abilities, such as schoolwork, games, music, painting or with the item 'more attractive appearance' ('looks and figure' in the case of girls).

The relation between the anxiety/depression items and childhood 'neurotic traits' was small, few of the correlations being above 0·3. They were particularly low in the daughters, in whom 'worried more about exams' had zero relation to adult

worries. The number of correlations of 0·2 or above with the 12 anxiety/depression items are shown in Table 7.

In the 'schooldays and before' section, the item to show the highest correlations with the adult items was 'more adventurous in his play' (not in the daughters' questionnaire) which had correlations of 0·3 or more with several items relating to sociability, leadership and lack of control by self and others.

Smoking and drinking

It can be seen from Table 8 that smoking and drinking are related to sociability, resistance to discipline, impulsiveness and irregularity of life; in fact, to the constellation of traits which constitute extraversion. In the case of smoking, the correlations are very similar for the two sexes. For the sons, the correlations are very similar for smoking and drinking; there was no question on drinking in

Table 8. Items which correlate at least 0·2 with either smoking or drinking in sons

Item	More drinking	More smoking	
	Sons	Sons	Daughters
Worked harder at school	–029	–249	–242
More friends at school	248	253	109
Spent more time on own	–211	–332	–157
More adventurous in play	219	191	—
More receptive to guidance by parents	–123	–226	–226
Needed to be disciplined more often	165	308	—
More shy with strangers	–209	–230	–122
Enjoyed parties more	292	271	297
Brought more friends to the home	225	248	—
More active in seeking girl friends	261	304	—
More resentful of parental discipline	166	276	277
Changed his friends more often	188	246	221
More shy with girls	–235	–278	—
Took more trouble with his appearance	202	177	152
Set himself higher standards	–124	–222	–232
More impulsive	207	250	349
More serious	–256	–292	–235
Saved more	–268	–367	–236
More alcohol	—	424	—
Spends more time in social activities	383	343	251
More regular and methodical in habits	–094	–236	–270
More law-abiding	–239	–271	–306
More persistent in doing something that interests him	–112	–224	–151

the daughters' questionnaire. Smoking and drinking are not related to the anxiety/depression items.

Discussion

Reliability and validity

Assessment of the reliability of the ratings is based on the agreement between mothers and fathers. The mean agreement over all pairs and all items of 91·2% for sons and 88·4% for daughters (compared with a chance expectation of 50%) would seem to be very reasonable. I think it is also reasonable to assume that the parents obeyed the instruction to make their ratings independently. This seemed to be the case from inspection of the completed questionnaires, in which the disagreements had a random appearance (apart from the correlation with objectiveness of item) and the alterations were as often towards disagreement as towards agreement. Moreover, in a series of 25 pairs of parents who filled in the questionnaire during an interview, and in whom there was no opportunity for collusion, the mean agreement over all items was 85%. This series was an unselected group of parents of patients undergoing treatment in the Bethlem Royal Hospital, and the lower agreement can be accounted for by their lower educational standard and the fact that many of them, being mentally disturbed themselves, must have had less than average objectivity in rating their children. The intelligent parents who were interviewed showed the same high agreement as the parents who replied by post.

It may seem remarkable that parents can have an accurate memory of events which happened to their children 20 or 30 years ago. In fact the reliability of the information which parents provide about their children has been seriously questioned by several authors (Robbins, 1963; Yarrow, Campbell & Burton, 1964). The apparent disparity between previous work and the present might be attributed to the following features of the present study:

1. The parents were volunteers out of a large population, and probably had paid particular attention to the development of their children.

2. Many of the items were obtained from parents' answers to questions of the general form 'how did the two children differ (at such and such an age, or in such and such a situation)'. Thus the items consist of things that parents notice and talk about, rather than items which are exclusively of interest to the investigator.

3. Comparative ratings can be expected to be more reliable than absolute ratings for several reasons:

(a) it is easier to make a comparative judgement than an absolute one. This fact is well known to those who have to match shades of colour, and is used to advantage in colorimetry.

(b) it seems not unlikely that parental memories are stored in comparative rather than absolute form. Parents are likely to notice and remember that one child was slower at reading than the other, whereas they may completely forget the actual ages at which reading commenced.

(c) the factor of 'social desirability', or the natural tendency to present oneself and one's children in a favourable light, does not enter into the comparison of two of one's own children.

It could be argued that the degree of agreement between parents is to some extent spurious, and that what is being agreed on is a joint parental stereotype of the children, having little basis in reality. Against this view is the fact that correlations between items are on the whole low, and stereotypes are not likely to be as numerous and highly specific as would be required to account for the present data. In particular, the lack of correlation between the various abilities argues against the operation of stereotypes. There is no overall stereotype of 'the able one'; nor, since there are no negative correlations either, is there a tendency to subdivide the abilities in a stereotyped way, as if to say 'A is the clever one, and B is good at games'.

In favour of validity is the fact that the items concerned with 'neuroticism' and 'extraversion' distinguish clearly between psychiatric patients and their healthy sibs, as would be expected from previous work (e.g. Kendall & Di Scipio, 1968); and that the birth order effects are also very similar to the findings of other workers. These agreements in areas where previous work is available for comparison confirm the validity of the items concerned, and lend some hope that an equal validity attaches to the items for which a comparison with previous work is not available.

Characteristics of the comparative method

Some advantages of the use of comparisons rather than absolute ratings have already been described. Most studies of personality development make use of absolute ratings, and therefore some further advantages and disadvantages of the comparative method ought to be discussed.

One major advantage is a reduction in the sources of variance, and in such a complex field any such reduction is to be welcomed. When one brother is compared with another, individual differences due to social class, religion, racial group and family background are eliminated. The main sources of variation which are left are the within-family genetic variance and the environmental differences which occur within families. These last are of two main types: the systematic differences due to position in sibship, and the random differences due to the chances of life experience. The present findings suggest that the main systematic difference can be attributed to the first-born position; it would be possible to eliminate this source of variation by excluding from a study pairs in which one was a first-born child. It might be thought that a third category of variation in behaviour exists: namely, that which follows from differences in physique or abilities; but at least in the present sample such differences were not associated with differences in personality.

Another advantage is the absence of correlation between traits due to assortative mating. If tall men marry pretty women, then in the population as a whole there will be a correlation between height and good looks, but the correlation will not be found within families.

A disadvantage of the method is the inability to cope with non-linear functions. When we know that one brother is taller than another we do not know whether they are both giants or midgets or within the normal range. If the significant variable is deviation of height from the mean of one's peer group, regardless of direction, then the effects of this variable cannot be assessed by the method of the present study. It would be possible to combine the two types of rating, and obtain both comparative and absolute measures; it would also be possible to obtain some quantification of the differences, and so increase the sensitivity of the method. These measures were not attempted in the present study because the aim was to maximize reliability and it seemed that this could best be achieved by a simple procedure.

Effects of birth order

The chance of being born in the first-born position, rather than later in the sibship, would appear to be one of the properties of William James' pebble, deflecting the raindrop to one or other side of the mountain range. There is consistent evidence that it affects a number of aspects of personality. Surprisingly, it is probably the only environmental variable within the range of variation usual in our culture about which that can be said. Therefore we must make the most of it, for both its practical and its theoretical importance, and I hope it will not be taken amiss if I devote rather a lot of space to what was really an unexpected by-product of our investigation.

It will be recalled (Table 3) that in our 412 pairs containing a first-born, the first-born was earlier at walking and reading, had more natural ability at schoolwork, worked harder at school and was given more responsibility there, was in childhood less fond of cuddling and easier to train to avoid traffic, and later on was tidier, less impulsive, more serious and methodical, more law-abiding and set himself higher standards ($P < 0{\cdot}001$). There was a suggestion that the first-born was also more nervous, less happy and spent less time in social activities ($P < 0{\cdot}01$).

These findings are in agreement with many studies both in England and America. Recent reviews (Sampson, 1965; Warren, 1966; Altus, 1966) are agreed on the overwhelming evidence that first-born achieve more both at school and later; although the results of the National Survey confirm the finding of the earlier Scottish Survey that there is no correlation between birth order and scores on intelligence tests, at least up to the age of 11 (Douglas, 1964). As to personality, Sampson (1965) concludes that the first-born is 'less likely to be a sociable, outgoing, highly rated individual, one who is empathic and sympathetic'. The first-born is less likely to express overtly aggressive feelings; and apparently he is more likely to seek and profit from the company of others when under stress. Apart from this last point, about which we have no information, the present findings agree closely with these statements, and for those items which do not show significant differences the trend is in the predicted direction (for instance, 150 first-born are more likely to speak

out when angry, compared with 178 who are more likely to bottle their anger up).

The study most similar to the present one in design was carried out in the Department of Hygiene of Harvard University (McArthur, 1956). Two hundred and fifty Harvard men were compared with their siblings, and comparisons were also made for 86 pairs of children of the Harvard men. In both cases, the comparisons were made by the investigators and not by the parents, who merely provided a description of each child. In both generations the first-born were found to be adult-oriented and characterized by a sensitive seriousness, while the second-born were peer-oriented and characterized by easy-going friendliness. The reports of the parents agreed well with observations of the Harvard men by a psychiatrist and of their children by an anthropologist. Our own findings agree closely with these, except for one point. The word 'sensitive' is not very precise, but in some respects at least our first-born did not have more of this quality. Less of them were 'more likely to be upset when told off or criticized' (132 to 165) and 'an unhappy event such as the death of a friend or relative' was less likely to upset them (112 to 140). Although they are less happy and more nervous, they are no more liable to have downswings of mood; their mood is if anything more constant and they are less likely to have upswings of mood (137 to 167). There is no difference in tendency to get angry, or to 'get depressed if things go wrong'.

To relate these findings to the two main dimensions of personality variation (Eysenck, 1947) we can say that first-born tend to be rated as more introverted on all the items which relate to the extraversion/introversion dimension, particularly on items describing serious, responsible, self-controlled behaviour. The relation to the neuroticism/stability dimension is far less clear-cut. There is a suggestion in the present data that first-born score high on some components of neuroticism (low mood and high anxiety) but low on other components (such as mood variations).

It must be remembered that practically all of these birth order studies have been carried out on Anglo-Saxon subjects towards the upper range of the social class distribution, and it would not be wise to generalize the results beyond this cultural group. However, the mechanisms operating within this group are of no small interest.

What is it about the first-born position which exerts such an influence on achievement and personality? My comments will be limited to aspects of the problem on which the present data have a particular bearing, but more extensive discussion will be found in the reviews quoted above. First of all, there is good agreement that the effect is a first-born effect, rather than a general birth order effect. And our own findings show that it is not seen in a first son or a first daughter unless these are first-born overall.

Some life experiences are inevitable in the first-born position, and it is likely to be very difficult to separate out their effects. There is a period of being an only child; there is the termination of this period; there is the fact of being the oldest of a group

of siblings, and the fact of having no older siblings. Relations with parents and siblings are bound to be affected by these circumstances. In addition, many parents in the present sample reported that they had been tense, ham-fisted and strict in dealing with the first child but by the time the second arrived they were competent, relaxed and easy-going; this has been a general finding in birth order studies. Direct observation of mothers with 4-year-old children (Hilton, 1967) has revealed that mothers are more interfering with first-born than with second-born children.

However, certain factors associated with the first-born position are not invariable and can be excluded as causes of the first-born effects. If any effects are due to the fact that first-born are on the whole lighter at birth, then they should not be seen to the same extent in those first-born who happen to be heavier at birth. But in the present data the first-born effects (Table 3) are just the same in the heavier-at-birth first-born group. The same is true of difficulty at birth. It is also true of another environmental influence which affects first-born more than later children; namely, a change of school due to a family move to a new neighbourhood. Such a move occurred in 251 of our total of 609 pairs (41·2%). In many cases the move occurred while the elder was at school but while the younger was below school age (or not yet born). When the move occurred while both were at school, the elder was, of course, further on in his school career, and therefore perhaps more liable to suffer from the disruption; at any rate he was more often at the stage of adolescence when the peer group is thought to be particularly important for personality development. There were practically no cases in which the younger had to change school because of a family move when the elder had already left school. But whatever the effects of changing school may be on a child's life, the first-born effects were just the same in the pairs who had moved as in the pairs who had not.

Our data suggest that the influences which produce the various first-born effects are not the same. Such influences are likely to vary quantitatively between families, depending on the various family characteristics, and we would on the whole expect any single influence to exert all its effects on the same families. Suppose, for instance, the fact of having younger sibs gives a child more natural ability at schoolwork (the eldest child interprets the adult world to the younger siblings, and thus has constant practice in data-processing, whereas the younger sibs are mere recipients of data—an influence well brought out in the autobiography of Simone de Beauvoir) and also makes him less cuddlesome (perhaps by placing him in a more dominant role). Now in some families the younger sibs should be important for the eldest whereas in others they will be of little concern (big age gap, importance of neighbourhood peer groups, and so on). Therefore we would expect the two effects to be correlated. But this is not always the case. Three relatively independent groups of first-born effects emerge from the data. Early walking, reading and school ability are closely related. So are 'easier to train to avoid traffic', 'worked harder at school' and 'given more responsibility at school'. Both these groups are independent of each other and of 'fonder of cuddling and similar contact'. The other items such as

tidier, more serious, less impulsive, more methodical and law-abiding are all related to each other, but could not be compared directly to the others because they were punched on a second card; however, from their intercorrelations over the total pairs it seems likely that they are related to the second group. Thus it seems reasonable to infer that at least three separate aspects of the first-born situation are influencing personality development.

Birth rank studies of psychiatric patients are relevant to our problem. Most of these compare the birth rank distribution of the patients with that to be expected if they are randomly selected from a population which has equal numbers in each birth rank for each family size. Unfortunately several biases render this basic assumption doubtful (Price & Hare, 1969). For instance, Tuckman & Regan (1967) studied the birth rank distribution of 1297 children referred to a psychiatric clinic and found an excess of first-born over last-born; but this excess may on the one hand be an underestimate, because some of those who were last-born at the time of study may later cease to be so, or, on the other hand, it may merely reflect the fact that any population whose birth rate is rising tends to contain an excess of first-born among adults and older children. Because of the difficulty of controlling for these biases, and because results are in many cases contradictory, we cannot draw any firm conclusions yet about birth rank and predisposition to mental illness.

These objections do not apply to Mitchell's (1965) study of 677 English schoolchildren who were rated as deviant on various behaviour items by their mothers. Two hundred and thirteen of the 677 were last-born compared with 318 out of 679 well-matched but unrelated controls. The difference was largely limited to the last-born position, and is therefore in marked contrast to the present findings, in which no characteristic last-born effect was observed.

Predisposition to mental illness

The items relating to depression, anxiety and sociability (or rather the lack of it) are of particular interest to a psychiatrist. Depression, anxiety and unsociability are prominent features of most forms of mental illness; and even before the onset of the actual illness, most psychiatric patients suffer from an excess of these characteristics as part of their personalities. This has been most clearly revealed in twin studies, in which the patient is compared with a healthy co-twin (e.g. Kringlen, 1967) and it has also been found in comparisons with healthy siblings (Prout & White, 1956) and with former classmates (Bower, Shellhamer & Daily, 1960). Such traits, often called 'dysthymic' traits, are found in patients with depressive disorders, neurosis and schizophrenia, but probably not in those with psychopathic disorders (Tienari, 1963) or in those who have phases of elevation of mood in addition to their phases of depression (bipolar psychosis: Perris, 1966).

Knowledge of how these dysthymic traits behave in the general population bears on the problem of causation. It is not yet known whether the severe forms of mental illness which require hospital treatment are separate entities, caused by

major agents such as gene mutations, or whether they represent the extreme upper end of the distribution of some trait such as dysthymia in the general population. One theory, which derives considerable support from the work of Perris (1966), holds that bipolar psychosis, and perhaps a few of the severer depressive disorders and schizophrenias, are mediated by major genes; whereas the bulk of mental disorders are of multifactorial origin and occur particularly in those individuals who are at the extreme end of the dysthymia distribution. The present material offers some support for such a view.

In the first place, we have the relation between upswings of mood and downswings. In the case of severe mental illness these two phenomena are related (giving rise to the concept of manic-depressive psychosis). A patient who has a severe

Table 9. Data showing the lack of correlation between a tendency to upswings of mood and a tendency to downswings of mood (combined sexes)

More upswings	More downswings						Total
	1	2	3	4	5	9	
1	33	17	12	19	32	17	130
2	8	32	26	30	11	2	109
3	5	14	66	16	7	0	108
4	9	32	27	28	8	2	106
5	31	13	9	11	33	8	105
9	13	10	5	8	9	6	51
Total	99	118	145	112	100	35	609

1 = both parents score younger of pair; 2 = one scores younger, one don't know; 3 = both parents score don't know; 4 = one scores elder, one don't know; 5 = both parents score elder of pair; 9 = one scores younger, one scores elder.

downswing of mood is particularly likely to have an upswing of mood and vice versa. In our normal sample of sons and daughters, however, these two phenomena do not appear to be related (Table 9). The correlation between the upswing item ('more likely to have periods when he is unusually active, full of ideas and enthusiasm') and the downswing item ('more likely to have periods when he is low-spirited, inactive or irritable') is –0·008 in the sons and 0·020 in the daughters. The coefficients could not be much closer to zero.

In the second place, we can compare the characteristics of the sons and daughters who score highly on the dysthymic items with the characteristics of patients suffering from mental illness. In order to make a standardized comparison, I will mention

some unreported work carried out on psychiatric patients with the same questionnaire.

The 26 sons and daughters who had suffered a discrete mental breakdown have been added to 73 in-patients at the Bethlem Royal and Maudsley Hospitals whose parents completed the same questionnaire (or an earlier, shorter version). The patients (as I shall call the total of 99) were, of course, more dysthymic than their

Table 10. Comparison of 99 psychiatric patients age 18–40 and their mentally-healthy siblings

Characteristic	Patient	Sib
More insistent on doing things his own way	44	24
Finds it easier to admit he was in the wrong	11	24
Sets himself higher standards	52	20
More critical of other members of the family	47	28
More often angry about something	46	25
More practical, less of an idealist	26	51
Fonder of cuddling and similar contact	20	19
Better co-ordination in movement	35	29
Closer relationship with mother	22	18
Closer relationship with father	13	14
Enjoyed going to parties more	31	32
More impulsive, liable to do things on the spur of the moment	41	32
More energetic	32	43
On the whole more talkative	24	26
More aware of other people's thoughts and feelings	46	31
A stronger, more forceful personality	34	40
If angry, more likely to speak out rather than keep it bottled up	34	39
More easily influenced by others	23	20

'Don't knows' and 'no differences' have been omitted. For items above the line $P < 0{\cdot}05$.

same-sexed sibs; the item to discriminate best was 'more nervous and highly strung' which applied to 67 patients and only 10 sibs (the parents were asked to make the comparison as the patients were before the onset of the illness; otherwise, of course, the difference would have been even greater). Patients with neurosis, depression and schizophrenia were all about equally different from their sibs on the dysthymia items. The only group of patients who did not differ from their sibs in personality were those who had suffered phases of both elevation and reduction in mood (4 in the affective disorder group and 5 in the schizophrenia group).

There was a marked concordance between the items which correlated with the dysthymia items in the normal sample and the items (other than the dysthymia items) which distinguished patient from sibling. The latter items are

given in Table 10 (above the line). The same items all show correlations with several of the dysthymia items in both sexes with the exception of 'sets himself higher standards'; this shows the expected correlation in the daughters but no correlation in the sons. The items which do not distinguish patient from sib do not, on the whole, correlate with the dysthymia items in the healthy sample. This applies to all the items below the line in Table 10, and in fact to all items except some of those describing methodical, conscientious behaviour. These show no tendency to distinguish patients from healthy sibs, but two of them do correlate with some of the dysthymia items (tidier, and 'more regular and methodical in his ways').

Thus we can say, within the limits of our samples, that psychiatric patients (except bipolar cases) tend to have personalities characterized by aggressiveness, rigidity and lack of practicality in addition to marked dysthymic traits, and that these characteristics are also related to the possession of dysthymic traits in the general population. This situation is most easily accounted for by the theory that most mental illnesses are extreme instances of a tendency to depression and anxiety which is widely distributed in the general population.

Of course, the items measuring aggressiveness, rigidity and practicality are far from satisfactory, and could well be expanded and improved in further studies. Another aspect of personality poorly measured in the questionnaire is level of aspiration. This plays an important part in a number of theories of mental illness, which see the illness developing as a result of a gap between level of aspiration and performance. Sir Denis Hill has recently summarized this view as it relates to depression (Hill, 1968):

> 'In the context of bereavement Lindemann described it [the reaction] as a state of crisis which will lead either to new adaptive behavior or to a maladaptive response. In terms of ego psychology, the gap which always exists in all of us between the self-image of what we know ourselves to be (the actual ego-state) and the image of what we would like to be, or feel we ought to be (the ideal ego-state), widens dangerously. This is a state which Joffe and Sandler identify as "pain".
>
> At some point the "credibility gap", to borrow a contemporary phrase, becomes so great as to be intolerable and a catastrophic lowering of self-esteem occurs. This, in the opinion of many observers, is the state which trips the depressive mechanism. If depression is a normal biologically based human response to profound lowering of self-esteem, knowledge of the processes by which self-esteem is normally maintained becomes a vital matter for us.'

Following this view, methods of psychotherapy have been classified according to whether their object is to increase the ability or reduce the level of aspiration (Mowrer, 1967). The theory predicts that a high level of aspiration is associated with a predisposition to mental illness; unless, of course, the level of aspiration is entirely secondary to level of performance, which seems unlikely. In the present

study, our psychiatric patients tended to 'set themselves higher standards'; this item correlated with the dysthymia items in the daughters but not in the sons. Nor were there correlations for 'more ambition to make a career for himself' in either sex; this item was not present in the first version of the questionnaire and therefore the information on psychiatric patients is scanty (it was scored for 27 patients and 20 sibs). The same applies to the item 'more realistic in the goals he sets himself' (15 patients to 28 sibs) which *does* correlate with the dysthymia items in the healthy population. This, taken with the item on practicality, indicates that it may be the sensibleness (and perhaps flexibility) of the level of aspiration, rather than its absolute level, which is related to mental health.

The retrospective method

In an excellent review of our knowledge of pre-morbid personality in affective disorders, Metcalfe (1968) points out the difficulties inherent in the retrospective method, particularly when the personality characteristics being sought are likely to be confounded with early symptoms of the illness. The same problems apply to the attempt to make retrospective associations between childhood and adult personality traits.

The more rigorous and satisfactory method is to carry out a prospective longitudinal study, so that predictions can be made before the event and thus be liable to refutation. However, the problems inherent in longitudinal studies of human beings are immense (Bloom, 1964). Clearly the prospective and retrospective approaches should be complementary, the flexible but possibly biased retrospective method being used to explore the field and develop hypotheses, the rigorous but inflexible and immensely costly prospective method being used to confirm and refute the hypotheses so generated. There is still a lot of exploratory work to be done.

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This report is largely the work of over a thousand parents who contributed observations on their children, and I hope they will consider this small addition to our knowledge of personality development an adequate reward for their effort. My particular thanks are due to Mrs Frances Roach who not only contributed her own observations but helped me in the prolonged labour of scoring and recording of the data. Assistance in analysis by computer was gratefully received from the Biometrics Unit and the Department of Psychology of the Institute of Psychiatry.

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Appendix

The daughters questionnaire is printed below. In the columns headed 'Elder' and 'Younger' are given the number of pairs, out of the 412 pairs of sons and daughters containing a first-born, in which one or both parents marked that column; pairs in which one parent marked elder and the other younger, and those in which both parents marked the centre column, have been excluded. The centre column contains the Elders as a proportion of Elders Plus Youngers.

The sons questionnaire differed in 13 items (marked *); for these items the data below relate to daughters only (198 pairs).

MEDICAL RESEARCH COUNCIL

DAUGHTERS QUESTIONNAIRE: for the comparison of the temperaments of two daughters by their parents.

Instructions. You are comparing your two youngest daughters over the age of 18. It is helpful to write the name of the elder at the head of the left-hand column, and that of the younger at the head of the right-hand column.

If the statement applies to the elder sister, put a cross against it in the left-hand column. If it applies to the younger sister, put the cross in the right-hand column. If there is no consistent difference between the sisters, or if you do not have sufficient information to make a judgment, put it in the middle column.

Try, as far as you can, to compare the sisters as they were at the same age. This means, of course, that you must not take into account any developments in the personality of the elder sister which have taken place since she passed the present age of the younger sister.

It is important that the father and mother should complete their own copies of the questionnaire independently.

The answers that you give are used for medical research and are strictly confidential.

	Elder	*No difference or don't know*	*Younger*
Name	.....		.....
Part 1. *Schooldays*			
1. More natural ability at schoolwork	206	0·61	129
2. Worked harder at her schoolwork	203	0·61	129
3. Worried more about exams	164	0·52	149

4. Had more friends among girls her own age	123	0·43	166
*5. More likely to stay away from school for a minor reason, such as a stomach ache	30	0·37	52
6. On the whole appeared to enjoy school more	165	0·54	143
7. More natural ability at music	130	0·44	167
8. Better at painting and drawing	153	0·52	141
*9. Parents and/or teachers expected more from her	87	0·60	57
10. Given more responsibility at school	180	0·61	113
Part 2. *Schooldays and before*			
1. Learned to walk at a younger age	157	0·55	130
2. Learned to talk at a younger age	183	0·62	112
3. Quicker at learning to read	197	0·66	100
4. Fonder of cuddling and similar contact	77	0·25	232
5. More frightened of things, such as the dark or being left on her own	120	0·50	118
*6. Thumbsucking to a later age	57	0·47	64
7. Easier to train to avoid traffic, etc.	141	0·69	64
8. More nightmares or night terrors	104	0·49	110
9. Cried more and for longer periods	126	0·49	129
*10. More confidence in herself	78	0·50	77
Part 3. *Physical development*			
1. Heavier at birth	131	0·37	224
2. More difficult birth	228	0·80	58
3. Better at games at school	135	0·44	170
4. Taller (when fully grown)	179	0·51	171
5. More muscular (when fully grown)	161	0·50	164
6. Broader in relation to her height (when fully grown)	158	0·49	167
7. More tendency to put on fat	149	0·50	149
8. On the whole, more robust physical health	127	0·48	137
9. More graceful in her movements	145	0·48	158
10. Had more attractive looks and figure	97	0·43	126
Part 4. *Home life* (*schooldays and after*)			
1. Helped more with housework; e.g. washing up	165	0·59	117
2. Closer relationship with mother	142	0·50	143
3. Closer relationship with father	119	0·49	125
4. More critical of other people and things	171	0·55	140
5. More receptive to guidance by parents	154	0·57	118
6. Kept her clothes and other things tidier	193	0·61	124
7. Spent more time on her own	168	0·52	156
*8. More affectionate to parents	42	0·39	66
*9. More jealous of brothers and sisters	48	0·52	44
10. Enjoyed family social life more	118	0·49	125
Part 5. *Social life in their 'teens*			
1. Enjoyed going to parties more	134	0·46	159
*2. More sought after by boy friends	59	0·41	85
*3. More choosey about her boy friends	71	0·52	64
4. More dependent on parents	112	0·44	141
5. More resentful about parental discipline	127	0·44	164

*6. Had more quarrels with her friends	39	0·47	44
*7. More worried about sex problems	45	0·62	27
8. Got more depressed if things went wrong	152	0·49	159
*9. More easy-going, took things as they came	70	0·45	84
10. Took more trouble about her appearance	146	0·46	170
Part 6. *Temperament*			
1. More constant in her mood from day to day	184	0·55	152
2. Sets herself higher standards	198	0·63	114
3. More liable to be upset when told off or criticized	132	0·44	165
4. More impulsive, liable to do things on the spur of the moment	134	0·40	204
5. Finds it easier to admit she was in the wrong	157	0·55	128
6. More energetic, less liable to sit around	167	0·51	159
7. More insistent on doing things her own way	147	0·45	179
8. More upset by unhappy events, such as the death of a friend or relative	112	0·44	140
9. On the whole more talkative	165	0·48	181
10. More aware of other people's feelings	145	0·45	177
Part 7. *Mood and disposition*			
1. More serious in her nature	208	0·67	102
2. A stronger, more forceful personality	176	0·55	144
3. More often angry about something	161	0·50	161
4. If angry, more likely to speak out rather than keep it bottled up	150	0·46	178
5. Less likely to be late for things	165	0·56	129
6. A happier, more optimistic disposition	136	0·41	194
7. More nervous and highly strung	191	0·59	134
8. More liable to have periods when she is unusually active, full of ideas and enthusiasm	137	0·45	167
9. More liable to have periods when she is low-spirited, inactive or irritable	142	0·48	156
10. More practical, less of an idealist	179	0·53	156
Part 8. *Interests and habits*			
1. More ambition to make a career for herself	131	0·48	142
2. Greater interest in current world events	181	0·58	130
3. More interested in religious or moral issues	147	0·53	128
4. Tends to save more of her money	178	0·53	156
5. Has been more of a cigarette smoker	103	0·46	123
*6. Takes less interest in the rest of the family	40	0·50	40
7. Spends more time in social activities	120	0·41	173
8. Spends more time in hobbies such as dressmaking	142	0·50	140
9. Spends more time reading or watching TV	135	0·47	152
10. More regular and methodical in her ways	209	0·61	136
Part 9. *General*			
1. Worries about her health more	121	0·54	103
2. More law-abiding, tends to obey rules	183	0·64	105
3. Her mood depends more on her own success and failure	141	0·46	165

4. More realistic in the goals she sets herself	160	0·57	119
5. Calmer, less likely to get excited	177	0·52	162
6. More easily influenced by others	129	0·44	161
7. Tends to laugh more	123	0·43	164
8. More shy at meeting strangers	168	0·55	138
*9. More critical of herself	72	0·47	82
10. More persistent in doing something that interests her	135	0·50	134

Filled in by father/mother (please underline which applies).

Thank you for filling in this questionnaire. If you have any comments to make about it, or if there are any important differences between your daughters which have not been mentioned, please write them on the back of this sheet.

The items extracted from the inventory accompanying the questionnaire were as follows: type of education (boarding versus day); length of education; age at marriage; number of children; more illness; more allergic illness (asthma, etc.); more psychiatric illness (not used as psychiatric patients used in separate analysis); more environmental stress; older at family move to new neighbourhood; age at menarche (daughters); more highly paid job (sons). In appropriate cases the state of the elder was taken to be that at the present age of the younger.