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The Relationship between Schizophrenic Patients' Perceptions of Their Parents and the Course of Their Illness

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Sixty-two schizophrenic patients completed the Parental Bonding Instrument (PBI), a measure of perceived parental characteristics, rating their parents on care and protection. PBI ratings were related to a one-year course of illness. Patients who perceived their parents positively tended to experience a milder course of illness if they were in frequent contact with them, and a more severe course if they were not; the reverse was true for patients who perceived their parents negatively. PBI ratings were unrelated to the age at onset of illness. This suggests that patients' perceptions of parental attitudes influence the course of schizophrenia by a current stress effect. The PBI, used alone or in conjunction with other predictors, distinguished good- and poor-outcome cases and appears to be a potentially clinically valuable tool.

Various schools of research have explored the possibility that styles of parenting, atypical dominance patterns, family disharmony, or abnormalities of communication provoke the appearance of schizophrenia in predisposed individuals (Hirsch & Leff, 1975; Doane *et al*, 1981). Despite extensive investigation and debate, it is still not clear that patterns of family interaction affect the risk of offspring developing schizophrenia. Research in a related area (on the course of the illness), however, has allowed more definite conclusions to be drawn. Several studies have demonstrated a relationship between the attitudes of close relatives towards a schizophrenic family member and the course of the patient's illness (Brown *et al*, 1972; Vaughn & Leff, 1976; Leff & Vaughn, 1981; Vaughn *et al*, 1984). High levels of criticism or overinvolvement expressed in a structured interview with the relative (expressed emotion or EE) are associated with higher rates of psychotic relapse. This finding, together with associated research on arousal levels in schizophrenia (Tarrier *et al*, 1979; Sturgeon *et al*, 1984; Tarrier & Barrowclough, 1984), and the effects of family psychoeducational intervention (Leff *et al*, 1982, 1985; Falloon *et al*, 1985; Hogarty *et al*, 1986), indicates that domestic stress plays an important part in shaping the course of schizophrenia, and suggests that such factors should routinely be considered in the clinical management of the illness.

The measurement of EE is a research technique not readily applied to everyday clinical work. A separate stream of research, however, holds out prospects of simplified assessment of family relations and prediction of the course of schizophrenic illness. Parker *et al* (1979) have developed a 25-item, self-report measure, the Parental Bonding Instrument (PBI), which takes subjects 5 or 10 min to complete. The PBI allows subjects to rate their parents on a variety of attitudes, and behaviour related to two dimensions, care and protection, as they remember their parents treating them during the first 16 years of life. The two dimensions of care (or affection) and protection (or control) were isolated as fundamental parental characteristics in factor-analytic studies (Parker *et al*, 1979; Parker, 1983).

The PBI has been shown to have adequate test–retest reliability in schizophrenic and other subjects as a measure of perceived parental characteristics. There is some indication (from concurrent completion of the PBI by subjects' siblings and parents) that the instrument can be an acceptable measure of actual parental characteristics (Parker *et al*, 1979; Parker, 1983). Parker has shown that this simple, self-report measure, like EE, is capable of predicting schizophrenic relapse. In a sample of 72 schizophrenic subjects, those who assigned one or both parents to a low-care/high-protection group were more likely to be readmitted to hospital in the 9 months following hospital discharge. These subjects also had an earlier age of initial admittance to hospital, and Parker argued that this finding suggested an association between perceived parental characteristics and the onset of schizophrenia (Parker *et al*, 1982; Parker, 1983).

While the perceived parental attitudes defined by the PBI are similar to high-EE characteristics, some important differences between the two measures should be noted. The PBI examines the influence of the subject's relationship with the parents only, while EE assesses the attitudes of any key relatives – spouses and parents alike. The PBI is a measure of the subject's recall of parental attitudes during his

or her childhood and adolescence, whereas EE is a measure of current attitudes of relatives towards the subject.

The EE research, furthermore, has shown an influence of the family environment on the course of psychiatric disorder only. In contrast, Parker *et al* (1982) claimed an association between perceived parental characteristics, as revealed by the PBI, and both the course and onset of schizophrenia. Parker contended, moreover, that the influence of family environment on the course of schizophrenia is premorbid in origin. The EE research, on the other hand, makes no claims about the development of the disorder but indicates that a current and modifiable family environment influences the course of the illness.

This study was designed to assess the accuracy of the PBI in predicting a 1-year course of schizophrenia, to gain an impression of the potential value of the measure as a clinical tool. The results were also examined in conjunction with Parker's contention that the PBI detects a premorbid effect on the onset and course of schizophrenia (Parker *et al*, 1982).

Method

Subjects

The initial sample comprised all of the adult schizophrenic patients enrolled in continuous treatment for a 1-year period, beginning on 1 October 1983, with the largest regional office of a comprehensive community mental-health centre. The treatment agency served a mixed semirural and urban catchment area and provided both in-patient and out-patient care. The diagnosis of schizophrenia was confirmed using DSM-III (American Psychiatric Association, 1980) criteria. All patients over age 17 years were included, regardless of their care circumstances at the commencement of the study. The initial sample consisted of 56 male and 23 female patients. The characteristics of the 62 subjects who completed valid PBI responses are given in Table I.

The patients ranged in severity from those whose illness had been stable and mild for years, to those who were highly disturbed and frequently relapsing. Intensity of treatment varied with the needs of the patient but included access to a wide range of individual and family-oriented psychotherapeutic and supportive services provided by a national model community-support system. All patients but four received antipsychotic medication during the year of the study.

TABLE I
Characteristics of subjects completing Parental Bonding Instrument

Variable	*All subjects (n = 62)*	*Frequency of contact with parent*		
		Frequent (n = 33)	*Intermediate (n = 14)*	*Rare or none (n = 15)*
Age in years (mean ± s.d.)	35.5 ± 11.3	33.5 ± 9.8	31.6 ± 4.6	43.4 ± 15.2
Sex				
Male (%)	44 (71.0)	25 (75.8)	10 (71.4)	9 (60.0)
Female (%)	18 (29.0)	8 (24.2)	4 (28.6)	6 (40.0)
Age at onset of illness in years (mean ± s.d.)	22.8 ± 7.2	20.4 ± 4.7	22.3 ± 5.3	28.5 ± 10.1
Course of illness during study year				
Subjects admitted to in-patient care (%)	29 (46.8)	16 (48.5)	8 (57.1)	5 (33.3)
Number of admissions (mean ± s.d.)	1.02 ± 1.42	1.09 ± 1.57	1.21 ± 1.42	0.67 ± 1.05
Duration of admissions: days (mean ± s.d.)	36.3 ± 71.3	34.4 ± 58.4	24.0 ± 66.9	52.0 ± 98.9
Subjects experiencing exacerbation (%)	42 (67.7)	22 (66.7)	8 (57.1)	9 (60.0)
Number of exacerbations (mean ± s.d.)	1.58 ± 1.61	1.42 ± 1.52	2.07 ± 1.90	1.47 ± 1.51
Duration of exacerbations: weeks (mean ± s.d.)	7.02 ± 8.57	8.06 ± 9.27	5.64 ± 7.15	6.00 ± 8.40
Medication use during study year				
Number of compliant patients (%)	44 (71.0)	22 (66.7)	11 (78.6)	11 (73.3)
Number of non-compliant patients (%)	18 (29.0)	11 (33.3)	3 (21.4)	4 (26.7)
Average daily dosage of chlorpromazine: mg (mean ± s.d.)	573 ± 909	653 ± 1160	523 ± 558	446 ± 448
Parental Bonding Instrument scores (mean ± s.d.)				
Subjects perception of:				
Care from father	19.2 ± 9.1	21.0 ± 9.2	14.1 ± 6.4	19.9 ± 9.7
Protection by father	16.7 ± 8.2	15.6 ± 7.2	18.1 ± 10.3	17.7 ± 8.2
Care from mother	23.2 ± 7.9	23.5 ± 7.4	23.4 ± 9.0	22.4 ± 8.4
Protection by mother	17.1 ± 7.3	17.7 ± 6.0	17.4 ± 9.7	15.4 ± 7.7

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Methods

Subjects were given the PBI to complete, after the beginning of the study period, at a time when their mental status was close to their best level of mental functioning; never when they were acutely psychotic. A subsample of 26 subjects completed a second form of the PBI a few weeks after the first occasion to evaluate test–retest reliability. The subsample consisted of all of the patients in frequent contact with a parent who were willing to complete a second form. The sequence of the questions on the second version of the PBI was rearranged, and some dummy items were added to lessen the effect of familiarity.

The frequency of telephone or face-to-face contact between subjects and parents was ascertained by questioning the subject and his or her therapist. Subjects were rated as being in frequent contact with a parent if they lived together or were in contact at least once a week on average throughout the year. Contact was rated as rare if it occurred less often than every 3 months, or never. In those instances where subjects were in more frequent contact with one parent than another, and data analysis required that both parents be considered together, the more frequent category of contact was used in the analysis.

The course of the subject's illness during the 1-year study period beginning 1 October 1983 was evaluated with reference to the number and duration of both clinical exacerbations and in-patient admissions. A clinical exacerbation was defined as an increase in the symptoms of schizophrenia that required an intensification of treatment, for example, hospital admission, medication increase, or an increase in the frequency of out-patient contact. Ratings of clinical exacerbation were made by a single researcher who was blind to the PBI responses; they were based on data in the clinical record and provided by the patient's therapist and psychiatrist. In-patient admissions to private and public psychiatric hospitals, and to an intensively staffed, acute-case residential treatment unit, were noted.

The average daily consumption of antipsychotic medication for each month of the study period was estimated from the psychiatrist's treatment record, and a conversion to the equivalent dosage of chlorpromazine was calculated. A judgment was made as to whether the subject had been compliant in the use of medication throughout the study period, by consulting with the patient's psychiatrist, therapist, and the treatment record, and by considering the patient's self-report. Estimates of patient consumption of medication were necessarily approximate and were not confirmed by assessment of serum neuroleptic levels.

The age of onset of the subject's illness was determined from the treatment record. In nearly every case, records were sufficiently detailed for the age of onset to be fixed with confidence. In a very few cases, it was necessary to arrive at an estimate with a possible error of 1 or 2 years.

PBI scores

The PBI allows subjects to score their parents on perceived care and protection. Parker conceptualises four parental styles indicated by the intersection of the scales for these two scores, as shown in Fig. 1. In Parker's research, subjects' scores were plotted separately for fathers and mothers on axes measuring care and protection, which intersected at the mean scores previously determined for non-clinical control groups (Parker *et al*, 1979; Parker, 1983). This approach was not considered appropriate for the present sample for the following reasons. Very few of the responses fell into Parker's 'optimal parenting' category. It is theoretically unacceptable, furthermore, to use Australian control-group data for comparison with an American sample. The authors conducted analyses using Parker's quadrant approach with a variety of methods for establishing the intersection of the care and protection axes, but the following alternate approach was considered equally appropriate on theoretical grounds and was found to be more accurate in predicting the course of illness in this sample.

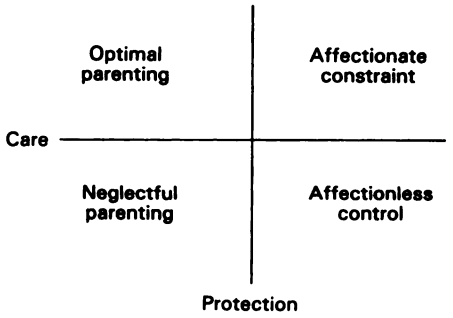

FIG. 1 Perceived parental styles delineated by intersection of Parental Bonding Instrument scales for care and protection (Parker *et al*, 1979).

A PBI difference score was calculated for each parent by subtracting the protection from the care score. As shown in Fig. 2, this method divides the responses into two groups, which may be labelled high risk and low risk. A high-risk parent, being perceived as unaffectionate and/or overcontrolling, is rated with a low difference score (care minus

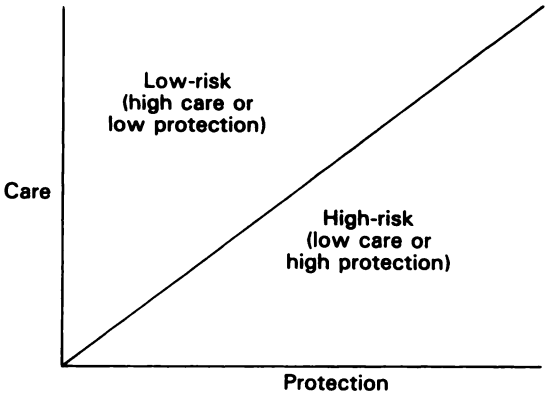

FIG. 2 Perceived parental styles delineated by Parental Bonding Instrument difference score (care minus protection).

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protection). The theoretical assumption inherent in this method is that either perceived low care or high protection may be a risk factor. The assumption of Parker's approach, which assigns responses to an "affectionless control" quadrant, is that both factors are necessary to place the subject at high risk. Using the PBI difference score to dichotomise the responses, our subjects were classified as having no parents, one parent, or two parents perceived as having high-risk characteristics. The cut-off scores selected to discriminate high- and low-risk parents, ⩽9 for perceived paternal attitudes, ⩽7 for perceived maternal attitudes, were chosen *post-hoc* to achieve the most accurate prediction of the course of illness.

Results

Sample characteristics

Of the 79 subjects in the initial sample, valid PBI responses could not be obtained from 17; the reasons for failure included the subjects' refusal to participate, the subjects' fluency in English being inadequate, or the questionnaire responses proving incomplete or grossly unmodulated. Multiple *t*-tests revealed no significant differences in demographic or psychiatric characteristics or in the 1-year course of illness between subjects who completed a valid

TABLE II

Interaction of Parental Bonding Instrument responses and degree of contact with parents (n = 61)

Variable	*Contact with parents*[1]	*Number of high-risk parents*[2]			*Two-way interaction (contact/number of high-risk parents)*	
		0	*1*	*2*	*No covariates (P)*	*Covarying age, age of onset and medication compliance (P)*
Number of subjects	Frequent	8	11	14		
	Intermediate	3	5	6	—	—
	Rare	6	0	8		
Personal and psychiatric characteristics						
Mean age: years	Frequent	33.6	38.3	29.7		
	Intermediate	36.0	31.2	29.8	NS	—
	Rare	38.3	—	44.9		
Mean age at onset: years	Frequent	19.3	21.1	20.4		
	Intermediate	25.7	20.8	21.8	NS	—
	Rare	25.0	—	29.3		
Number of subjects compliant with medication (%)	Frequent	5(62)	9(82)	8(57)		
	Intermediate	2(67)	5(100)	4(67)	NS	—
	Rare	2(33)	—	8(100)		
Course of illness						
Mean number of admissions	Frequent	0.25	0.82	1.79		
	Intermediate	0.67	0.60	2.00	0.043	NS
	Rare	1.33	—	0.25		
Mean duration of admissions: days	Frequent	4.9	23.0	60.1		
	Intermediate	10.7	1.0	49.8	0.002	0.019
	Rare	127.8	—	1.6		
Mean number of exacerbations	Frequent	0.38	1.27	2.14		
	Intermediate	1.00	2.00	2.67	NS	NS
	Rare	2.00	—	1.25		
Mean duration of exacerbations: weeks	Frequent	2.25	8.45	11.07		
	Intermediate	6.67	3.20	7.17	0.007	0.036
	Rare	13.00	—	1.50		

1. Frequent = living with one or both parents or in contact at least once a week; intermediate = in contact with parent less often than once a week, but at least once every 3 months; rare = in contact less often than every 3 months

2. High-risk father = paternal care minus overprotection score on PBI = 9 or less; high-risk mother = maternal care minus protection score on PBI = 7 or less.

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PBI and those who did not. Significantly more of the subjects who were rarely or never in contact with their parents, however, failed to complete a valid PBI: in part, this was due to the inclusion, in this group, of immigrants who were not fluent in English and who were separated from their parents by migration.

In the sample of subjects who completed a valid PBI, those who were rarely or never in contact with their parents tended to be older. Table I shows that subjects who were rarely in contact with their parents also tended to have a later age of onset and fewer, but longer, in-patient admissions.

Reliability of the PBI

A subsample of 26 subjects completed a second form of the PBI, a few weeks after completing the first. Test–retest reliability was found to be high. Pearson correlation coefficients ranged from 0.79 for paternal protection to 0.88 for paternal care. All values were significant at the 0.001 level.

Interaction of PBI and parental contact

Two-way analyses of variance revealed a number of significant interactions between the PBI assignment of one or more parents to the high-risk (low-care/high-protection) category and the frequency of contact with the parent for several of the course-of-illness variables. The most significant correlations appeared when a PBI difference score of 9 for the father and 7 for the mother was used. As Table II shows, where subjects were in frequent contact with a parent, the assignment of one parent to the high-risk category was associated with an elevated mean rate and duration of exacerbation and admission: the assignment of two parents to the high-risk category was associated with an even greater exacerbation of admission rate and duration. Where subjects were rarely in contact with their parents, the assignment of parents to the high-risk category was associated with a strikingly better course.

No interactive effects between the PBI assignment of parents and the degree of contact were found for such subject characteristics as age, age at onset of illness, or medication compliance. Pearson correlation analysis applied to the entire sample completing the PBI did, however, reveal an association between both age and medication compliance, on the one hand, and several course characteristics, on the other. In the subsample of patients in frequent contact with their parents, furthermore, significant correlations linked both age of onset and medication compliance with several course-of-illness variables. For these reasons, it was decided routinely to covary age, age of onset, and medication compliance in all analyses of variance, as a conservative measure.

TABLE III

Interaction of Parental Bonding Instrument (PBI) responses to father and degree of contact with father: course of illness (n = 62)

Variable	*Contact with father*	*Father*		*Two-way interaction (contact/PBI score)*	
		Low risk	*High risk*	*No covariates (P)*	*Covarying age, age of onset and medication compliance (P)*
Number of subjects	Frequent	11	12		
	Intermediate	1	9	—	—
	Rare	11	18		
Course of illness					
Mean number of admissions	Frequent	0.45	2.08		
	Intermediate	1.00	1.44	0.019	NS
	Rare	1.00	0.44		
Mean duration of admissions: days	Frequent	7.8	69.6		
	Intermediate	1.0	33.6	0.009	0.019
	Rare	73.2	12.3		
Mean number of exacerbations	Frequent	0.73	2.50		
	Intermediate	0	2.56	0.020	NS
	Rare	1.55	1.11		
Mean duration of exacerbations: weeks	Frequent	3.27	13.50		
	Intermediate	0	5.67	0.004	0.012
	Rare	9.82	4.33		

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TABLE IV

Interaction of Parental Bonding Instrument responses to mother and degree of contact with mother: course of illness (n = 62)

Variable	*Contact with mother*	*Mother*		*Two-way interaction (contact/PBI score)*	
		Low risk	*High risk*	*No covariates (P)*	*Covarying age, age of onset, and medication compliance (P)*
Number of subjects	Frequent	14	18		
	Intermediate	8	5	—	—
	Rare	6	10		
Course of illness					
Mean number of admissions	Frequent	0.43	1.67		
	Intermediate	0.63	2.40	0.006	NS
	Rare	1.33	.20		
Mean duration of admissions: days	Frequent	17.0	49.8		
	Intermediate	4.6	59.8	0.001	0.008
	Rare	127.8	1.3		
Mean number of exacerbations	Frequent	0.71	1.94		
	Intermediate	1.63	3.20	NS	NS
	Rare	2.00	1.20		
Mean duration of exacerbations: weeks	Frequent	5.93	9.50		
	Intermediate	4.50	8.60	0.021	NS
	Rare	13.00	2.40		

When two-way analyses of variance were conducted with these characteristics as covariates, significant interactive effects between PBI assignment and frequency of parental contact remained for two measures of the course of illness (see Table II). Medication compliance was the only covariate of the three exerting a significant effect in the analyses.

These analyses fail to take into account the fact that any subject may be in frequent contact with one parent and less frequent contact with the other. A more precise method of analysis considers the responses to each parent – father and mother independently (see Tables III and IV). Here again, two-way analyses of variance revealed significant interactive effects between PBI assignment of parents and the degree of parental contact for most of the course variables. All results were consistent with the general finding that frequent contact with a high-risk parent is associated with a more severe course, while frequent contact with a low-risk parent or rare contact with a high-risk parent is linked to a less severe course. Significant interactive effects remained for some course variables after age, age of onset, and medication compliance were introduced as covariates. Medication compliance was the only covariate with a significant effect.

The findings presented so far indicate that, in the sample as a whole, the perception of parental attitudes and medication compliance make independent contributions to the course of illness. The interrelationship of these factors can be clarified by two-way analyses of variance which examine separately subjects who were compliant in their use of medication ($n = 44$) and those who were non-compliant ($n = 18$). In general, the analyses reveal the same pattern of a more severe course for subjects in contact with a negatively viewed parent or out of contact with a positively viewed parent. The interactive effect of parental contact and perceived parental characteristics on the course of illness is most strongly apparent in subjects who are non-compliant with medication, but it is present to a limited extent in the sample of medication-compliant subjects.

Subjects in frequent parental contact

Considering only those subjects who are in frequent contact with one or both parents, the most powerful relationships between the PBI assignment of parents to the high-risk category and the course of illness emerged when responses to any absent parent were excluded. Using this approach in analyses of variance, significant correlations between PBI assignment and the course of illness were evident. For example, exposure to two parents who were perceived as showing high-risk characteristics meant six times as many admissions (2.40) on average during the study year, and exposure to one parent perceived as high risk meant twice as many admissions (0.70) as not being exposed to any parents perceived as high risk (0.38, $P = 0.003$). Similar associations were demonstrated between subjects' perceptions of their parents and the number of psychotic

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exacerbations ($P=0.003$) and the duration of admissions ($P=0.014$). After the introduction of relevant subject characteristics as covariates, significant correlations remained for two course variables, number of admissions ($P=0.004$), and number of exacerbations ($P=0.003$). Of the covariates, age of onset and medication compliance were found to exert a significant effect in the analyses. Of subjects in contact with two parents perceived as high risk, 80% experienced two exacerbations during the study year: in contrast, only 40% of subjects with one such parent and 15% of subjects with no such parents experienced two exacerbations (chi-squared, $P=0.008$). No relationship was found between PBI scores and the age at onset of the illness.

Subjects with rare parental contact

In the subgroup with rare or no parental contact, subjects who assigned both parents to the high-risk category revealed not only a better course of illness but also a much greater compliance with the use of psychotropic medication than those with no high-risk parent. When medication compliance was introduced into the analysis as a covariate, along with other subject characteristics, no significant relationships between PBI assignment and the course of illness could be demonstrated. Medication compliance was the only significant covariate in this analysis. The findings make it clear that, for those with rare contact, the contribution of perceived parental attitudes to the course of illness is not independent of medication compliance. In this subgroup, as in others, age of onset bore no significant relationship to the PBI responses.

Predictive accuracy of the PBI

A discriminant-function analysis was conducted for two subsamples of subjects – those in frequent contact with their parents, and those in rare contact. Each outcome variable in turn was used to divide cases into good- or poor-outcome categories. The discriminant functions were generated to look at the power of the PBI difference score (care minus protection) in its own right; then three more predictor variables (age, age of onset, and medication compliance) were added to produce a more elaborate discriminant function. In the subsample of subjects who were in frequent contact with their parents, the PBI difference score was capable of accurately classifying 59–73% of the subjects into good- or poor-outcome categories, depending on the measure used. For subjects in rare contact with their parents, the PBI difference score sorted good- and poor-outcome cases with an accuracy of from 64 to 85% (but with the outcome gradient being the reverse of that found in the frequent-contact group).

When age, age of onset, and medication compliance, were included in the discriminant function, the accuracy of classification consistently increased. For some outcome measures, 90–100% of the subjects were correctly classified by the more elaborate model. Based on the relative size of the standardised discriminant-function coefficients, three predictor variables – the PBI difference score, the age at onset of illness, and the patient's medication compliance – generally contributed equally to the overall accuracy of the classification. The subject's age contributed relatively little to the predictive strength of the model.

Discussion

The sample

This sample of schizophrenic subjects was drawn from patients enrolled in treatment with a community mental-health centre, which offered comprehensive community-based and in-patient services. Fewer than half of the subjects were admitted to in-patient care during the year of the study. Many clinical studies of schizophrenia utilise a more in-patient-oriented method of sample collection; patients enter the study at a point when they relapse and are admitted to hospital. The sample in the present study, therefore, is somewhat broader than usual, in that it includes a substantial number of patients who rarely relapse. On the other hand, the relapse and admission rate in the sample as a whole was high. This is partly a result of the inclusion in the study of a substantial number of patients who were non-compliant with the use of medication.

The subgroup of patients who were in rare contact with their parents tended to be older, because it included all of the subjects whose parents had died. It thus included more patients with late age of onset. This group of patients had fewer and longer in-patient admissions, possibly because placement with their family after hospital admission was not feasible. The number and duration of clinical exacerbations in this group, it should be noted, was no different from the remainder of the sample. This subgroup appeared similar to the rest of the sample in other demographic and clinical characteristics, and in their mean responses to the PBI. There are no evident reasons to suspect that the distinctive characteristics of the group (apart from their rare parental contact) contributed to the pattern of interaction between the PBI and the course of the illness.

Parental relationship and onset and course of illness

No relationship was found, in this sample, between the subject's perception of his or her parents (as reflected by the PBI) and the age at onset of the illness. The subject's perception of his or her parents was found to correlate with the course of illness, with the direction of the effect being dependent on the degree of contact between subject and parent. In those cases where contact was frequent (once a week or more), the course of the illness tended to be more benign when subjects saw their parents as more affectionate and less controlling. By contrast, where

contact with parents was rare (less often than every 3 months) or non-existent, the reverse picture was found.

How may we account for these findings? Several possible explanations may be ruled out by the finding that the direction of influence of the perceived parental relationship on the course of illness differed depending on the degree of subject–parent contact. It is theoretically possible, for example, that a subject with a more severe illness might hold a distorted and negative perception of the parent, or have a more negative relationship with the parent. If either of these explanations was correct, however, we would find more frequent relapse associated with a negative view of the parental relationship, regardless of the degree of parental contact, and this was not the case. It is possible that patients with a more severe course of illness might develop a negatively biased view of their parents if they were in frequent contact with them, but idealise their parents if they had rare contact. To explain our data, however, we would also have to argue that mildly disturbed patients display the reverse bias – idealising frequently seen parents, and being hypercritical of rarely contacted parents. It is difficult to find logical grounds for this interactive explanation. One could argue that a common genetic factor might produce an unaffectionate and controlling personality in the parental generation and a more severe course of schizophrenia in the second generation. Again, this explanation would predict the same correlation between course of illness and parental attitudes regardless of the degree of parental contact, and this is not borne out by our findings. Similarly, our results weaken Parker's contention that parental attitudes in childhood and adolescence exert a persisting effect on the subject, producing a predisposition to more severe course of illness (Parker *et al*, 1982). The likelihood of such a premorbid effect is further diminished by our finding (in contrast to Parker's study) that the age at onset of illness was unrelated to the patient's perception of parental characteristics.

One possible explanation fits the observed data – that the subject's perception of his or her parents' attitudes exerts a current effect on the course of the illness. This is also the model that fits most closely the findings of the EE research. However, whereas EE attempts to measure actual parental attitudes, the PBI is designed to measure the subject's perceptions of early parental attitudes. There is no evidence indicating that the PBI is a valid measure of actual parental attitudes in a schizophrenic sample.

The raw data support the possibility that while negatively perceived parental attitudes might promote poor outcome in schizophrenia, positively perceived parental attitudes promote improved outcome, and loss of a positively regarded relationship with the parents leads to a worsening of outcome. When we take into account, however, that the difference in outcome in the group in rare contact with their parents was, largely, accounted for by better medication compliance in the patients who did well, the picture becomes more complex. There is some evidence in these data to suggest that loss of contact with positively viewed parents, regardless of medication compliance, may adversely affect the course of schizophrenia. If we consider separately patients who were non-compliant with the use of medication, we find that the same pattern of worse outcome for subjects in contact with a negatively viewed parent or out of contact with a positively regarded parent holds true for all measures of the course of illness. In the case of medication-compliant subjects, this pattern of outcome is evident (although statistically non-significant) for all of the course measures when responses to the father are being considered, but is only true of one course measure when responses to the mother are examined. That the outcome pattern is more clearly defined in the non-compliant subjects suggests a number of possible explanations: 1. regular medication use may mitigate the effect of family stress or parental loss; 2. loss of supportive parents may lead to non-compliance with medication; or 3. non-compliant patients may be likely to be asked to move out of the parental home.

We may conclude, overall, that our data support the possibility that negatively viewed parents are experienced by a schizophrenic offspring as a current stressor that adversely affects the course of the illness. There is some evidence, moreover, that positively perceived parental attitudes may exert a therapeutic effect on the course of schizophrenia, although, to a certain extent, this influence may be mediated by an effect on the patient's compliance with the use of medication.

Reliability of the PBI

The PBI was assessed as having good test–retest reliability in this sample of schizophrenic subjects, greater in this study than in Parker's (Parker, 1983). The reason for the greater stability of the measure in the present sample may be that both forms of the questionnaire were completed while the subjects were free from acute psychotic features. In Parker's study, the schizophrenic subjects completed the PBI for the first time on hospital admission; they completed the second form at a later date when they were less psychiatrically disturbed. Parker found the second set of PBI responses to be more closely correlated with the subsequent course of the illness. We may

conclude that the PBI is a more reliable instrument if used with schizophrenics when they are not acutely disturbed.

Clinical application of the PBI

The PBI is quick to administer and score – 5 or 10 min for each. We found that the difference between the scores on the two scales (care minus protection) for each parent was a simple measure equally as predictive as the individual scale scores. A difference score of $\leqslant 9$ for the father and $\leqslant 7$ for the mother produced the most significant separation of parents into high-risk *vs* low-risk categories in our sample. Discriminant-function analysis demonstrated that the PBI difference score was capable of sorting patients into good- and poor-outcome categories with a fair degree of accuracy. This was true for subjects both in frequent and in rare contact with their parents. When the following factors – subject's age, age of onset of illness, and medication compliance – were added to the predictive model, a substantially higher level of predictive accuracy was achieved. Ranging from 73 to 100%, the level of accuracy obtained by this model appears to be superior to the capacity of the best standard demographic and clinical predictors of outcome (Bland *et al*, 1978; Strauss & Carpenter, 1978). The patient's age was the least useful factor in the predictive model.

Further research is required before we can conclude that these results can be generalised and applied to schizophrenic patients in different settings and treatment programmes. In particular, studies are necessary to confirm that the PBI cut-off scores which were selected here on a *post hoc* basis will yield similar results with new samples.

Family-interaction theorists have often shown more interest in the mothers than the fathers of schizophrenic patients. It is useful to note, therefore, that the PBI responses of this sample of schizophrenic patients to their fathers generally carried more discriminating weight than the responses to their mothers (as revealed by the standardised canonical discriminant-function coefficients). This suggests that, in assessing family relations in schizophrenia, no less attention should be given to the paternal relationship than to maternal characteristics.

PBI and EE

There may well be some overlap between the PBI as a measure of perceived parental attitudes and EE as a direct measure of relatives' attitudes. Both appear to detect a current stress effect on the course of schizophrenia. Further research is necessary to clarify this point. One important distinction between the two measures is that EE has been found to be a changing and modifiable feature. The PBI, in asking about parental characteristics during the subject's first 16 years of life, appears on the surface to be less susceptible to change. Adapting the PBI to a state measure, asking about the subject's perception of current parental characteristics, might yield an instrument conceptually closer to EE, but it could then only be used with patients who are in frequent contact with their parents. One advantage of the PBI would then be lost – that it may be used with any patient, regardless of the extent of parental contact.

It is conceivable, in fact, that responses to the PBI, even in its orthodox form, may be subject to change (as is EE), as changes occur in current parental relations. It is not unlikely that subjects' recollections of their early relations with their parents are influenced, to a degree, by their current parental relationship. The PBI's utility in predicting the course of schizophrenia could be mediated, principally, by its capacity to detect subjects' perceptions of their parents at this time in their lives; the validity of the instrument as a measure of perceived early parental relations may be of secondary importance.

Expressed emotion might be considered a superior technique for examining the question of family relations in schizophrenia because it is a standardised rating of parental attitudes, unaffected by the patient's bias. One might argue, however, that the PBI adds an important dimension to this analysis precisely because it includes the patient's subjective experience. If family relations do influence the course of schizophrenia (and there is a growing body of evidence to this effect), it is the subject's perception of these relations which is a central mediating agent in the process.

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