Social Class Factors in Autism[1]

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Social class factors were studied in families of 148 patients hospitalized at the UCLA Neuropsychiatric Institute from 1961 to 1970. Seventy-four patients with the syndrome of perceptual inconstancy and diagnosis of autism were matched according to age, sex, and time of admission with 74 hospitalized for other neuropsychiatric disorders. Statistical comparisons of parental data revealed no significant differences in mean age at time of patient's birth, educational or occupational level, income, social class indexes, or distribution. Certain significant differences were noted in racial and religious compositions, and more mothers of autistic patients were unemployed at the time of their child's hospitalization. These findings, which differ from many reporting a significantly higher social class standing of families of autistic children, are discussed. It is suggested that future surveys of more culturally and socioeconomically heterogeneous populations will confirm that there is no significant association between social class factors and autism.

Many investigators have studied the social class, occupational status, and educational level of families of children with diagnoses of early infantile autism, childhood schizophrenia, and other related disorders. It has been hoped that

such studies might provide discriminating diagnostic variables or clues to the etiology of these syndromes. Interest in this area of investigation can be traced to the initial work of Kanner (1943), who reported that parents of his first series of children with "autistic disturbances of affective contact" were highly educated and predominantly in professional occupations. Rimland's (1964) survey of pertinent literature up to 1962 concludes that,

> the evidence overwhelmingly supports Kanner's unprecedented early report that parents of autistic children form a unique and highly homogeneous group in terms of intellect and personality.

Not dissimilar, even though approached from a different viewpoint, were the findings of Lowe (1966) who investigated parents of 65 "autistic and/or symbiotic" patients, 34 with "chronic undifferentiated schizophrenia," and 146 with "general emotional disturbances." Lowe concluded that parents of autistic and schizophrenic children

> were significantly better educated and were employed in more highly rated occupations than were the parents of those in the 'disturbed' group, as determined by the Reiss Scale of Occupation and Social Status.

Data that confirmed such observations are presented in Table 1. It summarizes four earlier studies (Kanner, 1954; Kanner & Eisenberg, 1955; Creak & Ini, 1960; Pitfield & Oppenheim, 1964) and four more recent ones (Lotter, 1967; Rutter & Lockyer, 1967; Treffert, 1970; Kolvin, Ounsted, Richardson, & Garside, 1971) that utilized large groups of patients and carefully compared them to cases selected from the same hospital populations. Comparison and evaluation of results are somewhat impeded by variations in diagnostic criteria, patient populations, and indexes used to determine social class.

Lotter (1967) reviewed questionnaires describing 87,000 children from 8 to 10 years of age who resided in the County of Middlesex, England, during 1963 and 1964. Thirty-two children were classified as "autistic" using a modification of Creak's (1964) criteria. Their families were then compared with a similarly selected group of 22 "non-autistic, handicapped children with certain behavioral similarities."

Rutter's survey encompassed the records of children examined at the Maudsley Hospital Children's Department in London from 1950 to 1958 (Rutter & Lockyer, 1967; Rutter, Greenfeld, & Lockyer, 1967). He selected 63 patients

Table 1

Comparative Indexes of Social Class and Education of Parents of Psychotic Children

Source		Patients			Social class of parents* (percent)					Parents with college education (percent)	
Principal investigator	Year of publication	Diagnosis	N	I	II	I & II	III	IV & V	Fathers	Both parents
Kanner	1954	Infantile autism	100			90			74	
	1955	Infantile autism	105							
Creak	1960	Psychotic	100			60	31	9		
Pitfield	1964	Psychotic	100†	34	26	60	30	10		
Lotter	1967	Autistic—group A	15			60	▾		43	32
		Autistic—group B	17			31			12	13
		Nonautistic handicap	22			24			5	2
Rutter	1967	Psychotic	63	24	32	56	41	3		
Treffert	1970	Classical infantile autism	69						47	36
		Childhood psychosis	158						22	19
		Psychosis with organicity	53						16	15
Kolvin	1971	Early onset psychosis	50			39	41	20		
		Late onset psychosis	33			16	37	47		

Note.—All sources are detailed in the reference section on pp. 309-310. *Each investigator used his own criteria and parameters for defining social class groups. †Based on survey of mothers of psychotic children.

who had "an unequivocal diagnosis of childhood psychosis, schizophrenic syndrome of childhood, infantile autism, or any synonyms of these before the onset of puberty," noting that

> the great majority showed abnormalities from early infancy and were descriptively most like Anthony's early onset group and thus equated with Kanner's primary infantile autism.

These patients were then compared with a matched control group of 63 children from the same hospital population selected on "the basis of age, sex, IQ, and the absence of any diagnosis involving terms such as with psychotic features."

Treffert (1970) surveyed the clinical records of all children with the diagnosis of "childhood schizophrenia" below the age of 12 who resided in Wisconsin from 1962 to 1967. He retrospectively classified their records into three groups[3] and compared the epidemiologic data.

Kolvin et al. (1971) surveyed 80 psychotic children hospitalized at Oxford and Newcastle, England. He divided the patients into two categories, one comprising those with onset of symptoms before 3 years of age ($N = 47$) and the other, those with an onset of symptoms after 5 years of age ($N = 33$).[4]

The results of these four recent studies were in agreement. In each, the identified "autistic" patients came from families with significantly higher social class standing than their respective comparison cases. We have recently collated epidemiologic data on 148 families of children hospitalized at the UCLA Neuropsychiatric Institute from 1961 to 1970. This report presents our findings on social class indexes, education and occupational levels, and incomes of 74 families with autistic children. These families are compared to those of age- and sex-matched group of 74 patients who had been hospitalized during the same

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[3]Group A—classical infantile autism that excludes organicity and is characterized by early onset, withdrawal and inability to relate, speech problems, suspected deafness, and need for sameness ($N = 69$); Group B—a serious psychotic disorder that, while not classic infantile autism, includes some of the features of infantile autism but is characterized especially by an onset later in childhood ($N = 158$); Group C—probable psychosis but complicated by demonstrable organicity, known deafness, aphasia, or other evidence of brain damage ($N = 53$).

[4]The first group (infantile psychosis) had symptoms usually associated with the "classical or typical symptoms of early infantile autism (gaze avoidance, abnormal preoccupation, selfisolated patterns of behavior, echolalia, and overactivity)." The second group (late onset psychosis) had "symptoms usually associated with schizophrenia (hallucinations and thought disorders)."

time interval for other neuropsychiatric diseases. Also presented are comparative data from the United States Census (U.S. Department of Commerce, 1967, 1970).

METHODS

General Patient Population   •

All patients were hospitalized at the UCLA Neuropsychiatric Institute, a state and federally funded institution, where no admission biases existed due to race, religion, or economic circumstances. The vast majority was referred from the Greater Los Angeles Metropolitan Area which had an estimated 1969 population of 6,030,051 (Walkley, Dodds, & Wilner, 1968). Others came from within a 500-mile radius. Referral sources included all types of public and private clinics as well as private practitioners. Upon admission, each patient underwent a 2-3 month diagnostic period during which complete medical, psychiatric, nursing, social, and educational evaluations were conducted. Every patient who demonstrated some evidence of perceptual inconstancy (Ornitz & Ritvo, 1968) received further specific tests and observations prior to being diagnosed autistic.

Selection of Patients

Autistic. Hospital records of all patients, 12 years and younger, who had been discharged from 1961 through 1970 were surveyed. Except for certain cases discharged in 1969 and 1970, one of the authors (E.R.) supervised the clinical management of all patients in that age group. Thus, inconsistencies in evaluation procedures, in record keeping, and in diagnostic classifications were minimized. For purposes of this study, the entire clinical records of the 74 patients who had been diagnosed "autistic" were reviewed. Each patient was rated on a 0 to +5 scale of severity for the five subclusters of symptoms which are indicative of the syndrome of perceptual inconstancy. An overall rating was then determined in order to rediagnose each patient as autistic according to these criteria.[5]

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[5]The theoretical background and clinical parameters of this diagnostic procedure have been reported in detail elsewhere (Ornitz & Ritvo, 1968). In brief, the diagnosis is based on evidence in anamnesis and on psychiatric examination of symptoms in developmental rate, perception, motility, language, and relatedness. Symptoms in the perceptual area are a prerequisite for the diagnosis. Those in the other four areas were usually present in varying combinations depending upon the age of patient and other factors. Presence of other symptoms (seizures) or diseases did not preclude the diagnosis of autism.

Matched Patients

The matched group was formed by identifying the next admitted nonautistic patient of the same sex, whose date of birth was within 2 years of that of the previously admitted autistic child. The diagnoses of these 74 patients included behavior disorders and neuroses as well as all types of retardation and CNS pathology.

Data Processing

Data pertaining to dates of admission, discharge, and birth, sex, ethnic origin, religion, and age at which symptoms were first noted were coded for each patient and control case. Also coded were data on each parent detailing age at time of patient's birth, highest educational level, occupation, employment status, and income at the time of their child's hospitalization.

Social Class Indexes

A two-factor social class index (occupation and education) based on Hollingshead's criteria (Hollingshead & Redlich, 1958) and described in detail by Meyers and Bean (1964) was determined for each parent. Matched pairs of patients and controls were compared by their raw and weighted scores and parents' scores summed to obtain a family index (doubled in a one-parent family). The family social class indexes for the matched group were then rank ordered and divided into five equal social class groups. The cutoff points for each social class were applied to the autistic families so that the percentage falling into each class could be compared.

Census Data

Data from the United States Census (U.S. Department of Commerce, 1967, 1970) were not compared statistically to the autistic or matched groups or used to generate expectancy frequencies for the various socioeconomic parameters. Such comparisons would not have been valid due to the small number of patients available for the study and the sampling bias introduced by utilizing only hospitalized patients. If there had been a difference between the groups, then predicted distributions from census data might have provided valuable clues. However, since comparison revealed that both groups came from populations with similar social class distributions this issue did not arise.

RESULTS

General Characteristics

The frequency distribution and comparative data pertaining to general characteristics of autistic and matched patients are detailed in Table 2.

Table 2
General Characteristics of Autistic and Matched Patients

Item	Variable	Autistic group $n = 74$	Matched group $n = 74$	Comparative census data[d]
Age of admission[a] (months)	Range Mean	31-170 70	20-171 85	— —
Ethnic origin[b] (Percent)	White Black Other	87 7 6	97 2 1	90.0 7.0 3.0
Religion[c] (Percent)	Protestant Catholic Jewish Other or none	33 34 20 13	55 23 15 7	54.0 37.3 4.5 4.2
Sex (Percent)	Male Female	76 24	76 24	50.8 49.2
Mother's age at patient's birth[a] (years)	Mean SD	28 7	27 9	— —
Father's age at patient's birth[a] (years)	Mean SD	30 7	26 13	— —

Note.—[a]Student t-test not significant. [b]Statistical analysis: χ^2 $_{(25)}$ = 0.321; sign test significant at $p = < 0.05$ for whites versus all others. Tests of Blacks, Orientals, and Mexican-Americans versus others did not reach significance at this level. [c]Statistical analysis: χ^2 $_{(16)}$ = 15.721, sign test significant at $p = < 0.05$ for Protestants versus all others. Tests of Catholics and Jews versus all others did not reach significance at these levels. [d]*Ethnic origin*: 1969 estimate based on the 1960 census for the total population of Los Angeles County. *Religion*: 1968 estimate based on the 1960 census for the United States. *Sex*: 1969 estimate based on 1960 census data for all children under 15 years of age residing in the United States.

The age of children, when the symptoms of autism were first in evidence, ranged from birth to 24 months, as shown in the distribution below.[6]

Months	Percentage
Birth-6	29
7-12	26
13-18	33
19-24	12

Due to the small patient population, matching for age at admission proved to be most difficult for the period from 1961 to 1965. Throughout the entire period, such matching was also complicated by the fact that there were fewer girls available for the purpose. These factors account for the 15-month difference between the mean ages of the two groups. A statistical comparison disclosed that the distribution of ages was significantly different.

The autistic patient group was more racially heterogeneous. There were significantly more Caucasians and Protestants in the matched group. No known admission policies or methodological factors appeared to account for these differences.

The sex ratio (76% boys versus 24% girls) in the autistic group was comparable to that reported by Treffert (1970).

The mean age of mothers at birth of their autistic children was quite similar to that of mothers of matched patients. The mean age of fathers was 4 years apart, but this difference was not significant.[7]

Employment, Occupation, Education, and Income

The frequency, distribution, and comparative data on the work status, occupation, education, and income of parents are shown in Table 3. Eighty-six percent of mothers of autistic children were unemployed at the time their children were admitted to the hospital. In accordance with the coding system used, all such unemployed mothers were listed as housewives.[8]

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[6]This distribution was based on detailed studies of anamnestic data and did not necessarily correspond to the age at which the diagnosis was first established or when parents first became aware of subtle symptoms in their children.

[7]Parental age at child's birth was investigated due to known correlations in other disorders. Treffert (1970) noted that mothers of autistic patients in his Group A were significantly older than those in the matched group.

[8]It should be noted that some may have not been employed due to illness or other factors not related to the illness of their children.

Table 3

Work Status, Occupation, Education, and Income of Parents of Autistic and Matched Patients

Descriptive variable	Autistic group		Matched group		Comparative census data[d]
	Mother	Father	Mother	Father	
Work Status[a]					
Employed at time of admission	11	90	27	84	—
Occupation[b]					
Executive, major professionals	1	23	3	16	15
Managers, minor professionals	4	8	3	10	12
Administrators, owners small business	—	16	5	26	20
Technicians, clerical, sales workers	4	16	16	11	16
Skilled manual laborers	—	18	1	16	18
Semiskilled laborers	5	14	1	8	7
Unskilled laborers	—	4	—	1	6
Students	—	—	—	3	—
Housewives	86	—	71	—	—
Unknown	—	1	—	9	6
Education[b]					
Graduate school	4	19	4	12	—
College degree	14	16	12	18	10
Partial college	40	22	28	21	15
High school	23	24	39	27	29
Partial high school	12	8	15	10	20
Junior high school	1	7	2	3	13
Less than 7 years	6	4	—	3	13
Unknown	—	—	—	6	—

	Mother	Father	Family	Mother	Father	Family	
Income[c]							
Welfare	1	—	1	1	—	1	—
0-$4,999	87	11	12	77	17	11	18
$5,000-$8,999	4	47	43	12	31	35	15
$9,000-$11,999	2	11	12	2	15	14	23
$12,000-$15,000	—	13	12	—	12	12	25
Above $15,000	—	15	20	5	22	27	19
Unknown	6	3	—	3	3	—	—

Note.—All values are in percentages. Occupation levels were taken from Hollingshead (1965). Education and income levels were selected to match the available census data. [a]Statistical analysis: χ^2 (i) 2.386 $p < 0.5$ for mothers of autistic versus matched. [b]Statistical analysis of this variable by non-parametric sign tests of matched pairs yielded no significant differences for fathers. The distribution for mothers was significantly different at the $p < 0.5$ level. [c]Statistical comparisons by non-parametric sign tests of matched pairs yielded no differences that were significant at the $p < 0.5$ level. [d]*Occupation:* Percent of employed males, 14 years of age and older, residing in Los Angeles County in 1968. *Education:* 1960 census data for the total population of Los Angeles County, 25 years of age and older. School grades completed, $M = 12.1$. *Income:* 1968 estimate based on 1960 census data for all families residing in the Western Region of the United States. $M = \$9,365$ per year.

There were no significant differences in the employment rate of fathers. Also, no significant differences were noted in the occupation and education of both mothers and fathers and in the family income levels of the autistic and matched patient groups.

Social Class

Table 4 shows the results of summing Hollingshead's education and occupational indexes (Hollingshead, 1965) for each parent in each of the two groups.[9] Statistical comparisons disclosed no significant differences (mothers, $t = 1.94$, $df = 72$; fathers, $t = .758$, $df = 67$). The social class distributions among the groups were also very similar.

Table 4

Social Class of Parents of Autistic and Matched Patients

Group	Index*				Distribution (percent)		
	Mean	Median	SD	SEM	Class I and II	Class III	Class IV and V
Autistic							
Mother	71	75	16	2	36.5	14.9	48.6
Father	37	40	19	2			
Matched							
Mother	66	75	19	2	37.8	21.6	40.6
Father	36	37	20	2			

*Statistical comparisons by student t-tests revealed no significant differences.

DISCUSSION

An overview of the results indicated that parents of autistic and matched patients had similar socioeconomic characteristics. Statistical comparisons of their occupations, education, family incomes, social class indexes, and social class distribution revealed no significant differences.

Detailed analysis of the data revealed some differences that bear comment. Significantly fewer mothers of autistic children were employed (11% versus 27%). This factor lowered their income level and skewed their occupational

[9]The educational index was multiplied by 4 and the occupational by 7.

distribution. It could be suggested that more such mothers remained at home due to factors related to autism; autistic children may require more intensive parental supervision, be more difficult to place in clinics and schools, or in the care of domestic help or other caretakers. Unfortunately, the data shed no light on these clinical inferences.

Analysis of results also revealed that there was a significantly different proportion of non-Caucasians (10 versus 2 cases or 13% versus 3.8%) and Protestants (24 versus 40 cases or 33% versus 55%). Most likely, the difference pertaining to race would not have been found had the total number of patients been large enough to include subgroups representative of minorities rather than only isolated examples (in the autistic groups there were 5 Blacks, 4 Mexican-Americans, and 1 Oriental). We know of no clinical reason nor of any suggestion in the literature that religious preferences might have some association with autism.

How can we account for the fact that our findings are not in agreement with those mentioned in the introduction? The answer to this question probably lies in two related areas: (a) different methods of patient selection and (b) different potential patient population.

Differences in methods of patient selection. Despite three decades of research, autism remains an idiopathic disease that has no generally agreed upon pathonomonic signs or symptoms. As the history of medicine repeatedly demonstrates, early investigations of such diseases are replete with confusion. Differing theories rush to fill vacuums of ignorance and lead to differing clinical criteria for assessment and classification. This certainly has been the situation with autism since the syndrome was first described by Kanner. DeMyer, Churchill, Pontius, and Gilkey (1971), who compared five different diagnostic systems, concluded that

> Good agreement on diagnosis is common among people working in close collaboration. However, this agreement lessens considerably when diagnosticians without constant feedback compare diagnoses, even when relatively structured and standardized systems are in use.

The present study included only patients who had been completely evaluated, uniformly rated, and subjected to uniform diagnostic procedures. Thus many methodologic pitfalls were eliminated, but a new selection factor of hospitalization was introduced.

Our specific diagnostic criteria were similar in several respects to those used in the previous surveys. All patients manifested symptoms prior to 24 months of

age. This makes them comparable to patients with early infantile autism described by Kanner, to Rutter's (1967) cases ("the great majority showed abnormalities from early infancy"), to Treffert's Group A (1970) and to Kolvin's group (1971) with "infantile psychoses." Treffert's Group A excluded cases with definite evidence of organic brain dysfunction. Lotter, Rutter, and Kolvin did not separate patients on the basis of such evidence. Neither did we. In our autistic group, eight patients (11%) had histories of diseases usually associated with organic brain dysfunction, and five (9%) had signs of organic brain dysfunction at the time of hospitalization.

A second difficulty related to diagnostic selection is inevitable when dealing with a newly described and relatively rare disease. It usually takes at least a decade from the time a syndrome is introduced into the literature until the general medical community is sufficiently aware of its nature, and competent to identify and refer patients for proper evaluation. Medical students and practitioners have only recently been given the opportunity to gain a detailed knowledge of autism. Due to this time lag, many autistic patients have been completely overlooked and never referred to clinical centers where they could have been properly evaluated and studied.

Different potential patient population. A comparison of surveys, such as the present, requires an assessment of several kinds of patient population differences. One type is determined by the way in which existing clinical channels for referral are utilized. For example, certain parents will rush a slightly unusual child to the nearest medical center for complete diagnosis and evaluation. We have seen many children with only minimal symptomatology who have had repeated extensive workups before their first birthday. At the other extreme are parents who ignore even severe symptoms in their children or react to pathology by isolating the child from social contact. Such differences in parental attitudes regulate the flow of potential cases into medical channels and create biases over which clinics have no control. An example of this kind of bias existed in the present study. For reasons mentioned above, our survey was limited to young children who had been hospitalized. Thus, children whose parents had not sought evaluation early, or refused to allow their children to be hospitalized, were excluded.

Another kind of referral bias was inherent in this as well as in the other surveys. Each covered only a specific geographical area or potential patient population. So far they have been limited to a city, a county, or a state. None had as yet covered a catchment area large enough to be truly representative of the entire potential population of children with autism to be found throughout the world. The 1 Oriental, 3 Mexican-American, and 5 Black children with

autism in this survey were but a very small minority of such patients within these ethnic groups. Thus, we shall have to await results of surveys from many other clinics throughout the world before a representative picture of the cultural and socioeconomic background of autistic children can be pieced together. This factor alone could have accounted for the discrepancy between the results of our survey and those of all other surveys cited in this study since it appears that our population was more culturally and socioeconomically heterogeneous. If this is true, a new consensus could emerge when more diverse populations are studied.

The results of this study suggest that subsequent surveys will confirm that the incidence of autism is not correlated with parental social class. It is hoped that our findings will stimulate other investigators to explore cultural and socioeconomic factors in their patient populations.

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