RELATIONSHIP BETWEEN DEAFNESS AND PSYCHOTIC ILLNESS

By

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As Bleuler (1925) pointed out, all our relationships with our human environment are regulated through language. For this, auditory perception is essential, this can only take place if the peripheral auditory mechanism (viz., the tympanic membrane, ossicles, spiral ganglion of Corti and *VIII*th nerve) is not diseased. When a person becomes deaf through disease of any of the latter, it does not matter which one of the peripheral mechanisms is involved, the result is always the same. Often not knowing what his fellow men are saying he becomes doubtful about them: losing auditory contact with them he has to rely on an inner world of auditory memories and images; he misinterprets auditory sense impressions which have been distorted by disease, and incorporates tinnitus caused by such disease into his world of inner phantasy. He projects his inner feelings of inferiority caused by his deafness on to his environment and develops ideas of reference. Systematization soon follows, with active delusions of persecution. If the personality is sufficiently unstable a psychotic illness results.

I have endeavoured to show the existence of a higher proportion of paranoid patients (i.e., having delusions of persecution) among deaf psychotics than non-deaf psychotics, in order to verify this hypothesis.

The investigation was carried out in a mental hospital containing 1,100 patients. I investigated those patients in the hospital reported as being deaf, testing their hearing by means of the spoken word, a watch, tuning fork, and in those cases which appeared by all tests to be stone deaf, dropping a bunch of keys heavily on the floor behind their backs to exclude hysterical deafness. I used written messages to communicate with them. I also examined them with the auriscope. Audiometry was not practicable, for many were too paranoid and unco-operative.

A number of supposedly deaf patients turned out to be schizophrenics who were withdrawn and were able to answer questions spoken to them after gaining their confidence. Some schizophrenics denied vehemently being deaf, though they obviously were, as one of them put it "Why, doctor I can hear the spirit of Billy Brooks (a fictitious person) tormenting me"—in other words his inner world of auditory phantasy was the only reality to him.

The method of investigation was as follows:

This deaf group was compared with a control group of non-deaf psychotics, selected at random, and matched for age and sex. Owing to the fact that the eldest deaf female aged 94 was the only one of her age in the hospital, and

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nobody was found to match her, she was excluded. As she was paranoid, it could not be said that her exclusion prejudiced the results in favour of the theory I have expounded. One male aged 74 who could not be matched was also excluded: he too was paranoid.

The results of this comparison are as follows:

Total Deaf=40 comprising 25 females and 15 males.

TABLE I

Diagnosis	Senile Dementia	Depression	Hysteria	G.P.I.	Paranoid Schiz.	Non-paranoid Schiz.
Deaf ..	0	3	1	1	17	15
Controls ..	2	1	0	5	8	17

Diagnosis	Epilepsy	Chronic Mania	Cerebral Arteriosclerosis	Mental Defect
Deaf ..	1	0	0	1
Controls ..	3	2	2	0

Ideally, the experimental and control groups should be matched, subject for subject, on all other variables which could conceivably be related to both deafness and paranoid symptoms. In this experiment, for practical reasons, the groups were matched for age and sex only: the former being so obviously related to deafness and, to a significant though lesser extent, to paranoid symptoms that failure to control this factor would have rendered the results invalid for our purpose. It is possible that there are other effective variables, and it is hoped to design and carry out a more ambitious experiment as a follow-up to this initial pilot experiment to determine whether and to what extent other variables are effective.

For each member of the experimental group, a subject of identical age and sex was selected at random from the remainder of the hospital population, using the initial letter of each subject's surname as a basis for random selection.

ANALYSIS OF THE RESULTS

For the purpose of testing our hypothesis, it is necessary only to dichotomize these clinical groups into "paranoid" and "non-paranoid" cases. The figures are then as shown in Table II.

TABLE II

Distribution of paranoid symptoms and deafness in 80 patients

Group 1 (experimental group —40 deaf subjects)		Group 2 (matched control group —40 non-deaf subjects)	
Not-paranoid	Paranoid	Not-paranoid	Paranoid
23	17	32	8

A significant difference between the proportion of paranoids in group 1 and that in group 2 would support the hypothesis already advanced that deafness and paranoid symptoms are related. If the difference is not significant we can reasonably reject this hypothesis. But, if the proportion of paranoids in the non-deaf exceeds by a significant amount the proportion in the deaf, we must also reject our hypothesis. Thus our hypothesis requires that the proportion of paranoids in the deaf group shall *exceed* the proportion in the non-deaf

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group by a significant amount. Consequently, a *one-tailed* test of significance is required.

Significance was tested against a null hypothesis by calculating the exact probability of 17 or more paranoid cases falling in the deaf group if both groups are drawn from a common population of paranoid cases. Fisher's exact treatment of 2×2 tables was used (Fisher, 1925) i.e., the probability of occurrence is the sum of the probabilities of 17, 18, 19, 20, 21, 22, 23, 24, or 25 of the 25 paranoid cases falling in the experimental group.

The value of P is 0·026, which is significant at the ·05 level of confidence and consequently we can reject the null hypothesis and accept, with a fairly high degree of confidence, our hypothesis that deafness and paranoid symptoms are related. The actual degree of correlation was also estimated using the measure of tetrachoric correlation (e.g., Garrett, 1947) although, since this measure requires both variables to be continuous and normally distributed, this result should be interpreted with caution. The value of r_{tet} is ·40 with SE of ·14 (approx.) and a Critical Ratio of 2·86 which is significant at the ·01 level of confidence.

Thus, despite the practical experimental difficulties which restricted the population from which the subjects were drawn, and despite the difficulties of matching groups, it seems reasonable to suggest that the data demonstrate a moderate but significant correlation between deafness and paranoid symptoms —at least among populations similar to the one from which our subjects were drawn—as required by our hypothesis. It is not possible, of course, to infer directly from the data that deafness is a contributory causal factor of paranoid symptoms, but the results do not preclude this possibility and they indicate the importance and necessity for further research in this field.

Discussion

Not only is there a significantly higher number of paranoid patients in the deaf group, but there is less deterioration and disintegration of personality in them than amongst the controls, i.e., they are clean in their habits, neat and tidy and would pass for normal in the wards of a general hospital at a glance. (This is not a feature which can be analysed statistically however, because there are so many fine variations and differences in behaviour.)

A typical case history of a deaf paranoid schizophrenic aged 60 certified and admitted in 1941 goes as follows: "Mother says: Always imagined people were talking about her since adolescence. Attempted suicide 1939. Denies she is deaf, but obviously very deaf." On certification "She is not coherent in her statements and is evasive in her replies: has delusions that sounds and voices are travelling up a water pipe. She says people are jealous, and coming to take her rations." Latest note: "Believes she is a prisoner here, and that there is a plot against her. She is suspicious of her food and of all visitors who come to the hospital. She hears voices and laughs to herself in response to them." She is neat, tidy, has grounds parole and is in a convalescent villa: shows no sign of deterioration, is co-operative, and well behaved, not mixing much with other patients.

There is only one congenital deaf-mute amongst the group (as apart from 3 cases of deafness from an early age). This patient shows amentia, and requires to be washed and dressed. She is always incontinent and pays no attention to her toilet, cannot be trained to use a spoon, steals food from other patients at meal times and eats paper, earth or grass. Those with deafness from an early

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age (2 due to meningitis at the ages of 4 and 5 and one due to diphtheria at the age of 9) do not differ from the other cases in level of intelligence. But a separate investigation into relationship between deafness and intelligence would be necessary to go into this further.

The fact that most of the deaf paranoid schizophrenics have less disintegrated personalities suggests that there is less genetic constitutional loading in them, for Kallmann in his large investigation into schizophrenic twins discovered that in them environmental differences generally exerted no large influence. Thus, where an exogenous factor, like deafness, provokes a schizophrenic breakdown, deterioration is less likely to occur, though inherited factors must also play some part (Henderson and Gillespie, 1950). Exogenous factors are certainly held to be more favourable in prognosis (Henderson and Gillespie, *ibidem*).

In ordinary people attention to environment subjectively determined in accordance with preconceived emotional drives; images too are subjectively determined, and a hallucination which is only an image of marked vividness and intensity is regarded as a sensation by a hallucinated individual (Knight, 1952). Illusions when in a state of expectancy are common to all of us (Woodworth and Marquis, 1952) so how much more difficult it is for a deaf person to correct his illusions, especially if they are determined by tinnitus, as is aptly illustrated by the following case: He is a voluntary patient aged 57, has a bilateral mixed type of deafness resulting from diphtheria at the age of 9. Auriscopy shows retraction of the drum with scarring on the right side, and an old perforation on the left side. He is very depressed by banging noises in his head and voices. Doesn't know whose voices they are nor whence they come. He feels inferior because he's deaf and people can't understand him. Hears a tapping noise and insane laughter, ship sirens and thought telepathy. Somebody is putting their thoughts into his head and trying to drag him down into the mud. "It's someone with a big brain."

Summary

A hypothesis of the effect of deafness on the personality is propounded. A group of deaf psychotics is compared with non-deaf psychotics matched for sex and age. It is shown statistically that there is a significantly higher proportion of paranoid schizophrenics among the deaf than among the non-deaf psychotics. The deaf psychotics were found to be less deteriorated than the non-deaf and an explanation suggested as being due to the fact that exogenous factors are associated with less genetic constitutional loading.

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