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A Quantitative Method of Studying Delusional Intensity*

By L. R. C. HAWARD

Introduction

Despite the important place occupied by delusional thinking in psychiatric theory, comparatively little experimental work has been undertaken on this particular form of thought disorder. This is perhaps surprising considering its relevance to reasoning and belief as a social process, the role of the delusion in differential diagnosis, and the number of deluded patients available for investigation. Most investigators have been concerned with the content of delusions rather than their force, for the type of delusion has an undoubted influence on behaviour—quite clearly the patient with grandiose delusions acts differently from the paranoid individual; nevertheless, the available evidence suggests that the type of delusion reflects the individual's social history rather than the nature or degree of his psychopathology. More relevant to the latter is the degree of belief expressed by the patient in his delusions, the transitory (and malleable) ideas of an early depressive illness often contrasting with the implacable beliefs found in a condition of chronic melancholia. Some longitudinal studies have been undertaken recently in which the degree of delusional belief has been examined in terms of its resistance to manipulation, and this avenue of approach offers an extremely valuable scale of assessment of the individual psychiatric patient.

Yet there is a third, and perhaps clinically more significant, aspect of the delusion, and that is its emotional intensity. From the point of view of management, there is perhaps little difference in the *importance* of the behaviour problems produced by delusions in the paranoid or the grandiose patient, or between the incipient and the chronic psychotic. But problems of management become urgent as soon as the emotional intensity of the delusion increases. It is not a mere idea, but the *intense feeling* of guilt and unworthiness that may induce the suicidal patient to take his own life. It is fear, bitter hatred, smouldering resentment, or some similarly destructive emotion, not just suspicion, which moves the paranoid patient towards the tragedies of homicide. McNaughton, whose name has long been a cornerstone of forensic psychiatry, was deluded a considerable time before he attempted to assassinate Sir Robert Peel. It was the cumulative process leading to violent emotion which finally made him commit murder. Van Gogh lost his ear in frenzy, Morelle his life in ecstasy. It is passion which promotes action, for the related belief merely indicates its mode and direction.

With these thoughts in mind, there seemed some justification for a study of delusional intensity, which in the present context is defined as the emotional intensity concomitant with delusional thinking. In the present investigation use has been made of the patient's subjective reports, clinical observations, objective measures of behaviour, and electrophysiological recording. Only one measure from the physiological battery will be given here, that of the psychogalvanic reflex (P.G.R.), although respiration, pulse and blood pressure, while showing more variability, tend to follow a similar pattern.

Method

Some time ago, Lakosina (1959) a Russian psychologist investigating the P.G.R.s of schizophrenic patients, noted that reference to delusional material elicited a significant response, and suggested that the technique could possibly prove useful for estimating the degree of remission. The P.G.R. is, of course, a well-known correlate of emotional experience, many investigators having established its reliability and validity as an indicator of affective change

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(e.g., Smith (1922), Bayley (1928), Patterson (1930), Dysinger (1931), Darrow (1936), Wechsler (1938), Duffy (1941, 1946) *et al.*). Nevertheless, it has many limitations, the seriousness of which depends very much upon the nature and purpose of the investigation. Those encountered in clinical experimentation have been well summarized by Martin (1960); not all of them are relevant to the present study. The remainder fall into two problem areas, one of technique and one of measurement. The electrophysiological impediments which constitute the former, including intracellular and electrode polarization, changes in current flow with changes in tissue resistance, and drift in basal skin conductance, have been largely overcome by a new electronic psychogalvanometer designed by Shaw.* This device includes a thermionic system for maintaining constant current flow and special electrodes which reduce movement artefacts even with gross hand or arm movements. Other problems are basimetric ones, produced by the discrepancy between the absolute P.G.R. and its significance as a measure of affective change. Various statistical techniques have been used to compensate for this discrepancy and to take into account variables such as basal skin resistance and degree of autonomic reactivity. Probably the best existing solution utilizes the Stewart Rate of Change Analysis. In this technique the standard P.G.R. data are fed into a differentiating circuit which records the significance of the responses in terms of its rate of change (i.e., significance (S) OC dA/dT). In this way a measure of autonomic reactivity is obtained which is not directly influenced by basal skin conductance or drift. A further refinement in the technique consists of the insertion of a filter network into the system such that only responses above a certain level of significance will be recorded. The resulting record is therefore that of a straight line punctuated by short-time-base blips whenever a significant response has occurred. With modern electronic circuitry it is therefore possible to obtain a consistent, stable and meaningful P.G.R. record by a technique whose sensitivity is particularly valuable in the intra-individual exploration of affectively-loaded thought processes.

A sample of 200 deluded psychotic patients was used to assess the feasibility of quantifying the emotional intensity of a delusional system. 114 men and 86 women were included, matched very approximately for age and condition of illness. Various diagnoses were represented, and the sole criterion for selection was the presence of an unequivocal delusion as determined by a consultant psychiatrist. Many of the patients had already participated in a social study of delusions conducted by Lucas (1962) prior to and independently of the present study. The patients were seen on four separate occasions. A preliminary interview was used to gain rapport with the patient and to obtain details of the case. A specially prepared form was used to record details of the delusions and their ramifications and to classify them for convenience into six categories, namely paranoid, grandiose, sexual, religious, hypochondriacal, and inferiority. Many of the delusional systems incorporated more than one category, but generally the overlap was small. In addition to classifying the content of the delusions into these broad categories, the patients were further classified trichotomously according to the degree of emotional involvement with their delusions, in order to broaden the interpretation of emotional intensity from the P.G.R. Three ways of assessing the affective loading were used: (*i*) the subjective report of the patient, (*ii*) an assessment of objective signs of emotion in the form of expressive behaviour, and (*iii*) by speech analysis. For the latter purpose each interview was recorded and the typescript analysed to yield continuous Distress : Relief Quotients and Type-Token Ratios per 100 words of the patient's conversation, these being well-known devices for assessing the emotional content of speech (Jaffe, 1958).

On the basis of these assessments each patient was placed in one of the following categories:

(*a*) the uninvolved—those neither admitting nor showing emotion;

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(*b*) the covertly involved—those admitting but not showing emotion;
(*c*) the overtly involved—those both admitting and showing emotion.

No precision could be claimed for this form of classification, and trichotomizing the Speech Analysis scores was of necessity an arbitrary process, although this was made easier by the polymodal distribution curves for the D.R.Q.s and T.T.R.s

The second interview was devoted to the acclimatization of the patient to the apparatus. The patient was taken to the psychophysiological testing room and connected to the apparatus ostensibly for a "health test". The conversation was directed along topics designed to make the patient feel as much at ease as possible and the skin resistance, *inter alia*, at the beginning and end of this fifteen-minute interview was noted. The third session was similar, except that this time the conversation was restricted to objectively neutral subjects, and a record of the physiological responses, including P.G.R. trace, was taken as a baseline against which the records of the experimental session could be assessed.

By the fourth session the patient had become familiar with the experimenter and also with the experimental situation. This session consisted of two 15-minute periods separated by a five-minute interval. In one period the delusions were accepted by the experimenter as factual situations. The conversation was concerned with discussing these situations and the personal and social implications they had for the patient at the time of the interview. In the other period the experimenter denied the reality of the delusional material in a forceful manner. The order of these two approaches, the positive acceptance and negative rejection of the delusions, was alternated with each patient, but the experimenter continued the conversation after the recording session was concluded until he had placed himself in a neutral position regarding his belief in them.

Results

The incidence of delusion-types was as follows: paranoid 65 per cent., grandiose 40 per cent., sexual 31 per cent., religious 25 per cent., hypochondriacal 16 per cent., and inferiority 8 per cent. Neither the frequency order nor the actual figures differ significantly from those of Lucas (*op. cit.*) but of course both samples were drawn from the same population. In Table I the difference between the mean P.G.R. to neutral and delusional themes is shown, the latter producing a level of activity nearly six times higher than the former. Further analysis in which the "difference between means" has been tested produces the figures shown in Table II where three subgroups are detailed corresponding to the degree of emotional involvement assessed at the first interview. It will be seen that significant differences exist both between groups and also between occasions, and it is only when the conversation is restricted to neutral themes that this differentiation between the three groups is lost.

TABLE I

PGR to Verbal Content of Interviews*

Discussing:	Means	Range
Neutral themes	3·4	0–7
Personal delusions	18·5	0–58

N=200. P<0·01. * In KΩ

Discussion

This study has shown that, within certain limitations, the notion of Lakosina that the P.G.R. could be a valid index of a delusion is a valid one. In this investigation the P.G.R. has successfully differentiated between neutral and delusional material, and between the ways the clinician handles this material during an interview with the patient. Although the relationship between the content of interview and the emotional reaction of the patient has been explored in many previous studies, no information has been available to show how the type of emotional involvement will vary the degree of autonomic response. Even those who appear to be affectively flat or who show lack of concern with their delusions nevertheless may react significantly when these are manipulated by the clinician.

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TABLE II

Psychogalvanic Reflexes According to Handling of, and Emotional Involvement with, Delusions*

Emotional Involvement	Neutral Material	Delusions Accepted	Delusions Rejected	Significance†
None	3·0	5·1	10·8	0·05
Covert	3·1	9·4	16·9	0·01
Overt	3·4	15·7	27·3	0·01
Significance	N.S.	0·01	0·01	0·01

N=200.

* In Kilohms mean change.

† "Difference between means", Saunders and Fleming (1957).

The P.G.R. produces too great an inter-individual variation to be used as a precise tool in clinical work, and even in longitudinal studies as this one, where the technique may have a significant role, the inter-test correlations can be extremely low unless the major subjective aspects of the environment are kept relatively constant. In the present investigation it was found during the pilot study that the magnitude of the reaction depended to a great extent upon the personality of the experimenter, upon the effectiveness with which the delusional topics were elicited, and especially upon the use made of the contemporaneous P.G.R. record to follow up significant trends in the conversation. Some of the problems concerning the subjective meaning of clinical experiences have been discussed elsewhere (Haward, 1960, 1961, 1962) and some caution in assuming the generality of results is therefore necessary. It should be appreciated that these reactions were emotional concomitants to delusions whose existence had been determined previously and independently. The manipulation by the clinician of non-delusional material possessing emotional overtones would be expected to produce some similar reactions if the patient's beliefs were in question. The reaction relates to the degree of belief and not to the validity of such beliefs. More importantly, ward, consulting room, and laboratory, as well as the personalities of the investigating staff, all produce measurable differences in such complex psychophysiological reactions as the P.G.R. Bearing such reservations in mind, and holding constant as many perceptive variables as possible, it seems valid to determine delusional intensity in terms of psychogalvanic reactivity. The usefulness of such a measure was examined in a chemotherapeutic trial reported later (Haward, 1964).

SUMMARY

A sample of 200 psychiatric in-patients, all deluded psychotics of various diagnoses, was classified according to the type of delusion held and the patient's emotional involvement with it. After a stage of acclimatization, a number of psychophysiological measures were recorded (only P.G.R. being reported here) during a neutral interview, and used as the control baseline for later experimental sessions. In these the delusions were discussed and manipulated by active acceptance or rejection of their truth by the experimenter, producing significantly different levels of physiological reaction. The level of activity was also significantly different according to the patient's emotional involvement with his delusions, as determined by objective and subjective judgment and by speech analysis. It is concluded that by using a constant current P.G.R. apparatus and by holding constant subjectively significant perceptive variables in the experimental environment, the P.G.R. may be used as a valid indicator of delusional intensity. The need for caution in interpreting results of stress-evoked reactions when subjectively perceived differences are inadequately controlled is emphasized.

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