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The Subjective Experience of Time during Lysergic Acid Diethylamide (LSD-25) Intoxication

By

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Introduction

In this paper we are primarily interested in the phenomenological experience of time, during intoxication with lysergic acid diethylamide (LSD-25).

Review of Literature

In psychiatric literature there are many reports of pathological experiences of time. We will confine our attention to those that deal with alterations in the subjective experience of time during drug intoxications, particularly with mescaline and, LSD-25.

SEKKO (1913) during mescaline intoxications reported that he felt that the immediate future was rushing on at chaotic speed, and the time was boundless. BERINGER (1927) also described a similar disturbance under mescaline, in which only the present existed for the subject, there being no past or future.

GUTTMANN and MACLAY (1936) devoted some attention to the time disorder which occurred during mescaline intoxication, which they and also MAYER-GROSS (1951) felt were akin to the other perceptual changes which occur with this substance. The latter quotes the subjective experience of MITCHELL (1896) "Time passed with little sense for me of its passage". MAYER-GROSS also pointed out that KNAUER and MALONEY (1913) had tried to examine experimentally the subjective aspects of this disorder, and found that there was in general overestimation of time.

A number of workers have also reported the alterations in the sense of time during LSD-25 intoxication. STOLL (1947) one of the earliest workers in the field had commented upon it whilst BECKER (1949) paid considerable attention to it also, from an existential point of view.

DESHON et al. (1952) found disturbances of the time sense in 11 out of 17 experimental subjects, time being appreciated as undergoing acceleration or retardation, as did HOCH et al. (1952). SLOANE and DOUST (1953) found a slight, but insignificant mean reduction in both

normals and depressives as to the estimation of time, i.e. time appeared to pass more quickly. ANDERSON and RAWNSLEY (1954) reported time disorders in 13 out of 23 subjects (4 normals, 19 patients); the commonest experience being one of a "sense of temporal insularity" in which only the present was real, past and future being exceedingly remote. One subject experienced a 'timeless, suspended state'; a few felt time to be slipping away very quickly, whilst in others the passage of time was slowed down. In one case where the mood fluctuated between elation and depression, the passage of time was experienced concurrently as rapid and slow.

Recently FISCHER et al. (1962) have discussed at length the biological aspects of time in relation to the 'model' psychoses. They rejected the former common analytical belief in the timelessness of the unconscious "... it may be more correct to assume that the apparent timelessness of unconscious functioning and the apparent meaninglessness of time for unconscious functioning, is partly secondary to the wealth of unconscious omnipotent fantasies regarding the temporal aspects of phenomena". These authors, following HOAGLAND (1950) considered that the subjective experience of time was related to body temperature and that certain "exitatory" drugs such as LSD-25, mescaline and amphetamine are pyretogenic and hence they are capable of altering the subjective experience of time. "Time contracts, the physiological clocks run faster and events appear to pass slowly when body temperature is raised, whereas time expands, the physiological clocks run at a slower rate and events appear to pass faster when body temperature is lowered." WEINER and ROSS (1962) however, in the case of Amphetamine, found that this drug produced only a negligible effect on time estimation.

FISCHER et al. criticized earlier work thus, "Most experimenters with LSD-25 i.e. ARONSON and SILVERSTEIN (1959), BENNETT (1960) noted contraction in slow passage of physiological (subjective) time and therefore overestimation of clock time; however the pyretogenic action of LSD-25, HORITA and DILLE (1954), HORITA and GOGGERTY (1958), was not realised as a factor contributory to the phenomena".

Subjects

Twenty nine patients (15 males, 14 females) were studied. Twenty five had been admitted as in-patients or day-patients to the Manchester University Department of Psychiatry under the care of Professor E. W. ANDERSON and four patients had been in-patients in Cheadle Royal Hospital under the care of Dr. W. WADSWORTH. The diagnostic categories and distribution according to age and sex are shown by Tables 1 and 2 respectively.

Twenty five of these patients had personalities which were predominantly insecure (including both Sensitives and Anankasts; SCHNEIDER 1958), 2 patients had normal personalities and 2 were hysterical or attention seeking.

Prior to the administration of LSD-25 1 female patient, suffering from depressive psychosis, experienced a disorder of time experience. She felt that "Time goes horribly slowly — the last few years have vanished under my feet". Time appeared 'absolutely endless' to her. None of the other patients studied had reported subjective disturbances of time experience.

Table 1. *Distribution according to diagnostic categories*

Diagnosis	Males	Females	Total
Schizophrenia	4	2	6
Schizo-affective disorder	0	1	1
Doubtful schizophrenia	4	2	6
Depressive psychosis.	2	3	5
Neurotic depression	0	2	2
Insecure personality disorder . .	4	3	7
Hysterical personality disorder	1	1	2
Totals	15	14	29

Table 2. *Distribution according to age and sex*

	21—25 years	26—30 years	31—35 years	36—40 years	41—45 years	46—50 years	Total
Males	3	3	5	2	2	0	15
Females	5	2	1	2	3	1	14
Totals	8	5	6	4	5	1	29

Procedure

All patients received LSD-25 at least once, none of them had, as far as was known, previously taken the drug. Administration was in all cases by mouth, the drug being taken with a few mls. of water, on an empty stomach in mid-morning. The patient was placed in a quiet single bed ward with a doctor in constant attendance. During the intoxication period the patient was questioned almost continuously by the doctor concerning his experiences from a phenomenological point of view, all experiences being considered in detail — not merely time disturbances. No attempt was made to interpret symptoms dynamically or to give any form of psychotherapy. The dosage given ranged between 40 and 600 μ g, that is dosages considerably above the minimal amounts required to produce psychopathological effects, GREINER et al. (1958).

Results

We report in the first instance on the findings following the initial administration of LSD-25, the dosage of which ranged between 40 and 200 μ g.

Eight patients (3 males, 5 females), experienced time disorder following the initial administration of the drug. The patient mentioned above who, prior to LSD-25 experienced time disorder, felt that this was exaggerated; she described it as an 'awful state of eternity', a 'horror of eternity which I have had since I was a child and I just know it's something inside me which is wrong'.

The second female patient (insecure personality disorder) felt that she had lost all sense of time; there was a feeling of eternity, of timelessness. The third female patient (schizo-affective disorder) described her experience as losing all track of time, as though there were no time at all, and yet the time seemed to pass slowly. The fourth female patient (hysterical personality disorder) felt that time was standing still, the future seemed a long way off, but not the past, even though she estimated clock time very accurately. The fifth female patient (insecure personality disorder) felt that time was slow and endless.

The first male patient (insecure personality disorder) felt that time passed very slowly, that an hour seemed endless. The second male patient (insecure personality disorder) felt that events were remembered separately, as distinct entities with nothing prior to them and nothing following them. Each could be clearly recalled, but was isolated as it possessed no temporal relation. He described more fully retrospectively thus: an event took place, such as being asked the time. This was remembered, but it was easier to be asked the time again. At the third time of asking the first question was remembered, together with the memory of remembering it. All memories seemed to lack temporal relationships, but were set 'alongside one another'. The events were like seeing images in mirrors at an angle which is gradually narrowing, the number of images gradually increasing.

The third male patient (depressive psychosis) felt excessively slowed up, he felt remote spatially and temporally, as regards the latter both past and future seemed very far away.

The presence of a subjective disturbance of time experience was related to a number of other phenomena reported in LSD-25 intoxication, using the Chi square method (Yates correction used throughout). It was found that there was no significant relationship between the occurrence of a time disorder and mood changes, ego changes, auditory phenomena, tactile phenomena, sensations of taste, changes in space perception, thought disorder, erotic notions, paranoid-sensitive ideas, body image disturbances and drowsiness.

There appeared to be an association between the occurrence of time disorder and the occurrence of visual perceptual changes. This approached the conventional 5% level of significance ($X^2=3.73$, $p<0.10$).

There was a tendency for the occurrence of time disorders to be associated with the presence of a personality disorder (both insecure and hysterical personalities) compared to the other diagnostic groups pooled ($X^2=3.6$ $p<0.10$). The result approached closely the conventional 5% level of significance. The schizophrenics and doubtful schizophrenics combined were compared to the other groups pooled (as to the presence of time disorders) and it was found that the former group was negatively associated with the presence of time disorders, this reaching a significant level ($X^2=5.6$ $p<0.02$).

Results on data from second and subsequent administration of LSD-25.

Subjects

In all 13 patients (7 males, 6 females) received the drug more than once, only 1 patient (personality disorder) having previously experienced time disorder during the initial administration of LSD-25. The remaining 12 patients were then considered in respect of the presence of time disorders in their second and subsequent LSD-25 administrations. The diagnostic categories of these patients are indicated in Table 3.

Table 3. *Diagnostic categories of patients having more than 1 LSD-25 administration*

	Personality disorder (Hysterical and insecure)	Depressive psychosis	Neurotic depression	Schizo- phrenia	Doubtful schizophrenia	Total
Males	2	1	0	1	2	6
Females	1	2	2	0	1	6
Totals	3	3	2	1	3	12

Results. Of these 12 patients, 5 developed a time disorder on their second LSD-25 administration (a higher dosage being used in all 12 cases, ranging from 70—400 μ g). Two other patients (1 personality disorder, 1 depressive psychotic) developed a time disorder following their third administration of LSD-25 (dosage 150 and 300 μ g respectively). The schizophrenic did not develop a time disorder; one of the doubtful schizophrenic patients developed a time disorder, he received the drug on 16 occasions (dosage 100—400 μ g) and only once produced a subjective disturbance of time.

The subjective experiences were similar to those mentioned earlier, thus 1 patient described a state in which there was no beginning and no end in time, whilst another felt that the time element was peculiar, occurring in alternate short and long phases, yet both appearing to

pass quickly. A third felt that time was slipping away from him, the past appearing a long way off. One of the female patients felt that time was drawn out, another that it passed rapidly, whilst the remaining patient felt that she could no longer measure her sense of time; she couldn't tell whether she was taking a few seconds or five minutes to answer questions. She was unable to place herself in time, which appeared disjointed and fragmented.

The 12 cases receiving LSD-25 for the second time were considered statistically in respect of the presence of time disorder and the presence of other phenomena found under LSD-25 intoxication (FINNEY 1948). In fact there was no association found between time disorder and the following: mood changes, depersonalization, visual experiences, auditory experiences, tactile experiences, space perceptual experiences, thought disorders, erotic experiences, paranoid sensitivity ideas, body image disturbances, drowsiness, delusional perception and religious experiences.

Discussion

As expected LSD-25 is apparently able to elicit a time disorder in a high proportion of patients. There is, however, nothing specific in the type of time disorder produced by the drug; in some cases there was a change in the speed at which time is experienced, in others there was loss of continuity of time, in others a 'fragmentation' of time. We were unable to discover any factors associated with the type of time disorder produced under LSD-25.

As to the presence of a time disorder under LSD-25 it was found that there was an association with visual perceptual changes during the first administration, this closely approaching the conventional 5% level of significance. The visual perceptual changes were those characteristic of LSD-25 intoxication and were as follows: undulation of outlines, disturbances of perspective, heightened colouration, blurring, peripheral visual flicker. We could not however confirm this finding in respect of the second administration of LSD-25. We are not alone in reporting such inconsistencies between the first and second administrations of LSD-25. Additional research is needed to decide whether habituation, intra-person variability, interaction effects, mood and dosage are relevant variables. Thus the views of GUTTMANN (1936) and MAYER-GROSS (1951) in relation to mescaline, that time disorders are akin to other perceptual changes still requires confirmation.

We also found that there was a tendency for time disorder not to occur in the schizophrenic patients in our series; but to be reported by the nonschizophrenic patients. This, at first sight, appears strange in view of the many reports of time disorders in the literature on schizophrenia. This may be due to the fact that schizophrenics require a larger

dose of LSD-25 than normal people before producing symptoms, ANASTASOPOULOS and PHOTIADES (1962). On the other hand, the schizophrenic patients did produce a variety of other symptoms under LSD-25 at these dosages, so that there may be a more fundamental reason in relation to the nature of the schizophrenic process as to why they should not develop a time disorder. This point would be worthy of further exploration in a larger group of schizophrenics.

There did not appear to be any relationship between the LSD-25 mood and the presence of nor the type of time disorder, which was surprising in view of the clinical association between time disorder and affective disorder. Thus, it seems that it is a non-specific response and as yet we have few clues as to its genesis. It seems strange that one particular group of drugs should have the effect of causing disturbances of time experience which suggests that they act through a common cerebral mechanism, which perhaps is also involved when time disorders occur in the psychoses. It seems from the clinical evidence that time disorder is a manifestation of psychotic illnesses, of abnormal psychogenic reactions and of organic states. Investigations of the problem with LSD-25 tends to confirm that it is a non-specific symptom and that by increasing the dosage more individuals can be made to experience a time disturbance.

The view of FISCHER et al. that the time disorder induced by LSD-25 is a specific one in which time is experienced as passing slowly and is due to the pyretogenic action of LSD-25, seems to us to be untrue on purely clinical grounds. Thus in the first instance reports of varied time disturbances are given by subjects under the same drug, whether it be LSD-25 or mescaline. Secondly, these drugs commonly induce this remarkable experience of a time disturbance, whereas how infrequent are such reports in pyrexial illnesses, whilst again they are frequent in the functional psychoses, where at the most only minor changes in temperature occur. Finally the work ignores all the research on drugs and personality, i. e. LINDEMAN and MALAMUD (1934) who showed many years ago that drug responses were dependent upon personality factors (Mescaline being one of the drugs they investigated). We cannot deny that LSD-25 is pyretogenic and that this may affect clock time estimation, but to equate the latter with the subjective experience of time is erroneous in our opinion. In our investigations we were unable to find an association between the mood under LSD-25 and the type of time disturbance experienced by the patient. In other words, elation of mood did not always lead to a feeling of time standing still, neither did depression always appear to make time appear to pass quickly. It seems that such biological changes of mood can alter the 'physiological clock' but a subjective time disturbance is not a necessary corollary.

The moods induced by LSD-25 are also variable, they depend to some extent on the mood prior to administration, they are probably related to personality, and the 'set' of the experiment. Commonly the mood is labile (ANDERSON and RAWNSLEY 1954), alternating between depression and euphoria or elation, though rarely does the subjective time disorder appear to run an alternating course. The latter phenomena appeared in only one of our patients and in that instance the LSD-25 mood was one of calmness.

Summary

A brief review of the literature in relation to time disorder and LSD-25 is given. Twenty nine patients were studied as regards their time experiences under LSD-25. Eight patients reported an altered time experience following the initial administration of the drug. Twelve patients who had not developed a time disturbance in their initial administration, received LSD-25 a second time at increased dosage, 5 of these patients then experienced a time disturbance.

There was a tendency for time disorder to be associated with visual perceptual changes and for it to occur in the non-schizophrenics. Time disorder was considered to be a non-specific response. Recent views on the nature and genesis of time disorders are discussed.

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