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Perseveration in dementia praecox and manic depressive psychoses

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Boston University
PERSEVERATION IN DEMENTIA PRÆCOX AND MANIC DEPRESSIVE PSYCHOSES
by
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(B.S. in Ed., Boston University, 1935; A.M., Boston University, 1936)

submitted in partial fulfilment of the
requirements for the degree of
Doctor of Philosophy
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**APPROVED BY**

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Introduction

Since the end of the last century, when English psychologists (Galton and others) brought to the attention of the psychological world the problems of individual differences, much research has been done. Hundreds and, perhaps, thousands of articles, volumes, and monographs have been published on this subject. The quest for the discovery of laws which may, paradoxically enough, explain these individual differences was predominant.

Soon after the British beginning, American psychology took up the challenge and, headed by Cattell, attempted to get at the basic constituents of mind and the laws governing their variability and difference in degree among different individuals.

The new interest in the investigation of traits introduced a new elementism. For a while the traits as such, abstract as they were, were measured with little regard to their interrelationship with other traits and the total, concrete personality. More recently, however, psychology began to admit the error. It started to consider the measured trait within its context, in its psychological background, which is the unified personality. Thus, our analysis into traits is merely temporary; it presumes and anticipates a post-analytic synthesis.

Concurrent with the movement of individual differences, there arose, also, the new tendency to learn something about the normal personality from the study of psychopathological material (Freud, Gross, Jung, Adler and others). The extremes of behavior, as manifested in psychotics, hold, to some extent, the key to our understanding the behavior of the "normal" individual. The gap between the abnormal and the normal is bridged, it must be confessed, by a "process of logic." But, psychology, as it is at present, will have to resort to these devices, until our experimental
Proper and effective application of psychological testing involves understanding the principles of psychological assessment and interpreting results. This requires knowledge of theories and models of psychological functioning and development. It also involves understanding the nuances of psychological testing, including its strengths, limitations, and potential biases. Moreover, it requires the ability to apply psychological testing in real-world contexts, such as in clinical settings, educational institutions, and the workplace. The application of psychological testing requires a deep understanding of the subject matter, as well as the ability to interpret and communicate the results effectively.
techniques and the logic behind them are invulnerable and doubtlessly objective and "scientific." Thus far, as to some extent all sciences do, we are dealing with approximations of the truth.

The two tendencies mentioned above seem to be combined in the present study, which is a study of individual differences regarding perseveration in psychotic personalities. Much of the stimulus in this direction was given by Cameron who says that "Perseveration is a personality characteristic from the further study of which much is to be expected." Moreover, he points towards psychiatry as being in need of research directed in that path, and says that "...there is a considerable need for further work in classifying the issues in connection with their function...it may lead to the elucidation of matters of considerable psychiatric importance."
CHAPTER I

THE NATURE OF PERSEVERATION

Close and critical observation of everyday life will yield many types of human behavior that can be classified under the general term of perseveration. To some extent, greater or lesser, it is a general property of all mental behavior, and, as many other characteristics, it differs in extent and intensity with different individuals.

The difficulty in getting started on some task, the tendency to continue a certain activity once it is begun, the rush that "rises in the head," the difficulty caused by shifting from one activity or behavioral pattern to another, are all illustrative of what is meant by perseveration.

To bring an analogy, it is similar to the inertia of mental inertia which, presumably, is as much a property of mental energy, as physical inertia is of physical energy.

This inertia, "perseveration" or perseverative tendency, moreover, persists despite conscious efforts on the part of the individual to eliminate it and to rid himself of it.

6. HISTORICAL BACKGROUND REGARDING PERSEVERATION

Like psychology itself perseverance has a long past for a very short history. Many investigators have presented summaries of the non-experimental literature concerning perseverance and have not only reviewed the psychological writings on the subject, but have also traced back the recognition of the phenomenon and its manifestations through the philosophical literature as far back as Plato. Since this paper is not mainly

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1 C. D. Strong, History of Experimental Psychology, 111, 1903.
A. Perseveration in Everyday Life

Close and critical observation of everyday life will yield many bits of human behavior that can be classified under the general term of perseveration. To some extent, greater or lesser, it is a general property of all human behavior. And, as many other characteristics, it differs in extent and intensity with different individuals.

The difficulty in getting started at some task, the tendency to continue a certain activity once it is begun, the tune that "runs in the head," the difficulty caused by shifting from one activity or behavioral pattern to another, are all illustrative of what is meant by perseveration. To bring an analogy from physics---it is a sort of mental inertia which, presumably, is as much a property of mental energy, as physical inertia is of physical energy.

This inertia, "perseveration" or perseverative tendency, moreover, persists despite conscious efforts on the part of the individual to eliminate it and to rid himself of it.

B. Historical Sources Regarding Perseveration

Like psychology itself perseveration has a long past but a very short history.¹ Many investigators have presented summaries of the non-experimental literature concerning perseveration and have not only reviewed the psychological writings on the subject, but have also traced back the recognition of the phenomenon and its manifestations through the philosophical literature as far back as Plato.² Since this paper is not mainly

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2. Department of Urban Planning, New York
concerned with the historical basis of the term and its philosophical
genealogy, and since such broad historical excursions have not yielded new
methods of attack upon the investigation of it, the present review will be
confined to the psychiatric and psychological literature since the genesis
and introduction of the term "perseveration" as such.

It was in 1694 that Neisser applied the term "perseveration" for the
first time, in describing the repetitious and continuous activities of
certain mental patients. Muller and Pilzecker in connection with their
experimental work upon memory observed the tendency of certain material to
recur in consciousness spontaneously, without any conscious effort upon
the part of the observers. This phenomenon was attributed to the certain
"forces" possessed by ideas which recur as a result of the so-called
"perseverative tendency." Thus Foster quotes the above mentioned investiga-
tors as follows:

1. After one has been busy for several hours in attentive observation
   of a phenomenon, such for instance as the movement of a pointer on a
   scale, the phenomenon may suddenly present itself again, in image, with
   the distinctness of sensory experience, especially at times when
   attention is not demanded in other directions (Fechner's phenomena of
   sensory memory).

2. Impressive experiences sometimes reappear in the form of hallucina-
   tions, at least at times when attention is not demanded strongly in
   other directions.

3. A long continued motor activity sets up in the lower centers a
tendency automatically to continue or repeat the activity. After a
strong disposition of this sort has been established, the center affected
may 'reel off' the activity for a certain length of time, without the
necessity of further incitement (Motorische Einstellung).

4. Cases of perseveration, in the sense of the psychiatrists.

It is not in 1803 that Jefferson applied the term "rationalization" for the process of reducing the "scientific method" to "a device of the social sciences.

The process of "rationalization" involves the systematic classification and reduction of complex phenomena into simpler, more manageable components. This approach is often used in the social sciences to analyze and understand human behavior, social structures, and cultural patterns.

The process of "rationalization" has been widely studied in the social sciences, and its impact on society has been both positive and negative. On the one hand, "rationalization" has helped to improve the efficiency and effectiveness of social institutions, such as governments and organizations. On the other hand, it has also contributed to the homogenization of society, as different cultural and social norms are reduced to a common denominator.

In conclusion, the process of "rationalization" is a complex and multifaceted phenomenon that has both positive and negative consequences. It is important to understand the process of "rationalization" in order to fully appreciate its impact on society.
5. Quite against our will, ideas and thought in which we have been deeply interested for some time—melodies, chess games, and the like, may keep coming back into our minds.

6. We often make mistakes, in reading, hearing, speaking or writing words where words had in mind previous to the mistakes seem, by their continuance (Nachklingen), responsible for the disturbance.

7. In experiments on memory, ideas given as reactions in the first part of the series may recur during the latter part of the series without the volition of the observer, and without any evidence of special reproductive tendencies.

8. In spite of instructions not to think of the series, many observers cannot prevent certain syllables of a series which they have learned from coming to mind in the interval between the learning and the test.

9. In experiments by the methods of right associates, not only may a syllable which has caught the observer's attention be given once or oftener as a response in the rest of the series of which it was a part, but it may also recur as a response on a number of later days (habituelle Aushilfssilben).

10. Incorrect responses, in which the syllable spoken is a syllable from the series, but is given in the wrong place, are much more frequent in tests which follow at longer intervals, even though the number of correct responses in the two cases is approximately the same.

11. Series tested after a short interval give shorter reaction times than series tested after long intervals, even though the number of correct replies is approximately equal in the two cases....

12. Mental activity during a period shortly after learning not only disturbs the associative connections (retroactive inhibition), but also brings it about that the syllables are less likely to rise freely into consciousness.

13. Observers differ greatly in respect to the degree in which the above mentioned symptoms of perseverative tendency appear.

The conception of perseveration was considerably broadened and supplemented by the later contribution of Otto Gross, who drew largely upon his psychopathological clinical experience. However, as he says in the introduction to his monograph, "psychotic material merely accentuates certain qualities and gives us a chance to study the extremes from the

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6 O. Gross, Die Zerebrale Sekundaerfunktion, 69, 1902.
middle; the "normal" can be understood. His psychopathological investigations point toward an ultimate understanding of certain "Individualitätsverschiedenheiten" (individual differences).

Mental life is divided by Gross into the primary functions, which are synonymous with regular perception and ideation, and secondary functions, or after-functions. According to him:

In every nervous element the functional stimulation of which means a representation in consciousness, there lingers after the disappearance of that representation from consciousness, an after-function which no more possesses a correlate in consciousness and which has a further directive effect upon the associational activity.

This "Nachfunction" or "Sekundaerfunction," as he later refers to it, is according to Gross, different in different individuals. The strength and intensity of that secondary function is dependent on the type of consciousness possessed by the person in question. At this point the author resorts to a dichotomy which apparently had considerably influenced Jung in his creation of introversion and extroversion. Gross seems to classify human consciousnesses into two main types—the "narrow and deep" type and the "broad superficial" type of consciousness. The latter type finds its most extreme and salient expression in the manic condition of insanity in which:

...der Keiz von aussen ist staerker als die Sekundaerfunction früherer Vorstellungen, das Individuum wendet sich ungememt mit seiner Aufmerksamkeit dem ausseren Reizen zu.*

Thus there is the ability to shift quickly from one stimulus to another, from one activity to another without too much interference on

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7 Ibid, 10. (Translation—my own.)
6 Ibid, 22.

*When...the outward stimulus is stronger than the secondary function of previous ideas, the individual turns his attention, without inhibition, upon this outside stimulus. (Translation—my own.)
account of the lag of the secondary function.

The former type, however, does not shift his attention so quickly. In this "narrow and deep" consciousness "Vorstellungen" persist, make many connections and, skipping from subject to subject, from stimulus to stimulus, are prevented by the strong power of an enhanced secondary function. On the pathological side melancholia is an important harbor for that lag and after-function and, thanks to the latter, it is characterized by that monotony due to the existing "Intrapsychic Stereotypy."^9

As a consequence of this characterization of psychiatric groups, on the basis of the strength of their secondary function, he also comes to the typology among normals, i.e. to perseverators of narrow consciousness and to non-perseverators of broad consciousness. One thing must be reiterated, though stated in Gross' words on an earlier page—the secondary function that persists modifies the mental processes that follow it. It is essential in reasoning and in connecting "Vorstellungen," it lends a certain continuity to the mental process. The manic flight of ideas shows extremely little secondary function in contradistinction to the melancholic and paranoiac, whose excess of the secondary function keeps him dwelling on the same subject.

Thus, while Muller and Pilzecker spoke of ideas having forces that appear suddenly into consciousness as a result of favorable conditions (no other strong forces present), Gross posited a similar notion of a secondary function, characteristic of nervous plasm persisting for a time as an after-function, unconscious, though influential in subsequent mental activity.

Special importance is attached by Jung^10 to the phenomenon which was

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^9 Ibid, 40.

The focus then passes, once for all, to the economic function.

In this manner, the "economic function" plays a role similar to that of a "natural function." It is the driving force behind the strong power of an emerging economic institution. The same attention, and even more attention, is necessary to the function of an emerging economic institution. And after it has been determined to the function of an emerging economic institution, it can be considered a "natural function."
hinted at by Gross and was termed emotional perseveration. From his studies on the association processes Jung observed that "...they (the perseverated words) always contain something of importance for the individual psychology of the test person."\(^{11}\) One might say that association words which reveal a great deal of secondary function also reveal high emotional tone or "complexes" behind them. Even more significant than the above is the close connection between Jung's typology and that of Gross. The latter showed two processes which are widely separated from each other in regard to the secondary function and which serve as a basis for the typology.\(^{12}\)

Der Steigerung des Sekundaerfunction entsprich eine Verengung und event. eine Vertiefung, des Herabminderung der Sekundaerfunction eine Verflachung und event. eine Verbreitung des Bewusstseins.\(^{*}\)

Jung\(^{13}\) acknowledges his debt to Gross in his outline of the extrovert type which essentially coincides with Gross' broad and shallow consciousnesses, characteristic of the short secondary function of time. The long secondary function, especially in affective life, characteristic of the "deep and narrow" type of Gross and the "Strong relief given in this picture to the inner processes and the emotional life...."\(^{14}\) reveal the introvert immediately.

It was not strange that many investigations, as a result of psychiatric observations, and the above-mentioned theoretical considerations, were devoted to the exploration and the establishment of the true relationship

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11 Ibid, 106.
12 O. Gross, Die Zerebrale Sekundaerfunktion, 18, 1902.
13 C. Jung, Psychological Types, 341, 1926.
14 Ibid, 346.

\(^{*}\)The rise of the secondary function represents a narrowing and, eventually, a deepening and the decrease of the secondary function, a shallowing and eventually a broadening of consciousness. (Translation---my own.)
between the extremes, as well as the finer groupings of extroversion and introversion, and the secondary function or the perseverative tendency.

The extremes on the introversion-extroversion continuum were to be found in the psychopathological groups; the melancholics were considered to be on the introvert end of the scale, while the manics were at the other end of extroversion. The less extreme cases were those of normal individuals whose tendencies put them more or less definitely in one category (introvert or extrovert).

No discussion of the historico-theoretical background of perseveration would be complete without mentioning the impetus given by Spearman to the further experimental research in this field. He admits that on the basis of what is known thus far, perseveration is only a "half truth", especially as far as its establishment as a true faculty is concerned; but investigations of it have furnished "...the most lavish of promises for individual psychology."¹⁵

Spearman formulated a law of "lag or inertia" which states that "Cognitive processes always both begin and cease more gradually than their (apparent) causes."¹⁶ Spearman, in his discussion of perseveration, however, is not quite satisfied with what is known about perseveration, though the experimental evidence quoted by him seems to point towards its establishment as a group factor possessing functional unity. This latter conclusion, as it will be pointed out later (Chapter II), was a bit of premature optimism, since more critical experimentation seemed to shatter its foundations and put under question its right to existence. Of great interest to Spearman

is "...how this second universal factor stands in relation to 'g'." \(^{17}\)

Since "g" is the general factor of intelligence and "p" (perseveration) is another factor—it's degree of inertia; the relation between the two is a cardinal problem worth investigating.

Concluding this section it would be, perhaps, best to state Edwards' \(^{18}\) summary of the types of perseveration which will restate briefly the main characteristics of the phenomenon.

When a given note or combination of notes is struck there may be a continuance of sensory impressions long after the stimulus has ceased. Secondly, there may be a later spontaneous revival into consciousness of the note or combination of notes without the original stimulus. Thirdly, there may be the continuance of the past experience which hinders the reaction to a present experience, usually related to the former.

Thus, three phenomena are emphasized above, which seem to summarize perseveration in action—(1) continuance, (2) spontaneous recurrence, which is quite akin to continuance, and (3) interference, which is also a result of continuance of sensations or their inertia—"Nachfunction."

C. Perseveration and Physiology

Some of the earlier objections to the term perseveration or perseverative tendency were raised on physiological grounds as well as on psychological ones. Thus Foster states: \(^{19}\)

Not only may the necessity of supposing a spontaneous recurrence of mental contents be questioned, but a spontaneous activity of the nervous system, which seems thereby to be implied, is also made improbable by physiological facts so far known.

\(^{17}\) Ibid, 306.
Foster's objection on the basis of physiological improbability might have been well-based twenty-five years ago; however, present-day physiology does recognize a certain inertia and spontaneity in the nervous system. Forbes, in his discussion of "The Mechanism of Reaction," speaks of "after discharge, i.e., persistence of responses after stimulation has ceased, often for several seconds." He further explains the term as "The continuous discharge of impulses in the motor neurons for several seconds after the cessation of afferent stimulation...."

As a matter of fact, the physiological foundation of perseveration has been assumed for some time, especially, in the last decade or so, during which physiological sophistication has grown in psychology. For some investigators, the physiological counterpart of the psychological phenomena forms a necessary part of the definition of the term. It is especially characteristic of a fairly recent tendency to reduce concepts to their "ultimate physical or physiological truths or entities." One of these investigators says it rather clearly and concisely:

Perseveration may be defined as the tendency of a set of neurons, once excited, to persist in the state of excitation autonomously, showing resistance to any change in this state.

Pavlov, in referring to the kind of perseveration observed in mental patients, speaks of a "...pathological inertness in the motor area of the cortex."

The entire host of experimenters with the electro-encephalograms must

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As a matter of fact, the physiological foundation of perseveration has been assumed for some time, especially, in the last decade or so, during which physiological sophistication has grown in psychology. For some investigators, the physiological counterpart of the psychological phenomena forms a necessary part of the definition of the term. It is especially characteristic of a fairly recent tendency to reduce concepts to their "ultimate physical or physiological truths or entities." One of these investigators says it rather clearly and concisely:

Perseveration may be defined as the tendency of a set of neurons, once excited, to persist in the state of excitation autonomously, showing resistance to any change in this state.

Pavlov, in referring to the kind of perseveration observed in mental patients, speaks of a "...pathological inertness in the motor area of the cortex."

The entire host of experimenters with the electro-encephalograms must

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The subjective opinion on the part of psychological psychologists, which have been well-proven fact, is that the society is dominated by the stress of "\text{\textit{emotionalization}}". It seems to me that the emotionalization of the root causes of emotional stress and emotional solutions has none of the emotions of the problems. "\text{\textit{emotionalization}}" is a matter of fact, the emotionalization phenomenon of emotionalization.

How do we remember face these facts? In the last decade of the twentieth century, the psychologists emphasized the psychological component of the psychological processes. In addition to the psychological processes, in addition to the psychological processes, what is the psychological component of the psychological processes? In this context, a form of emotionalization is a matter of fact.

In the context of the psychological component of the psychological processes, we are led to the idea of emotionalization. In this context, a form of emotionalization is a matter of fact.
recognize a certain automaticity and spontaneity of nervous action in the
brain, as demonstrated by the action potentials in their sundry variations.
The waves (brain waves), as concluded by various investigators, "are due to
a spontaneous beat of an area of the occipital cortex concerning with
pattern vision; when the cells of this area are not engaged in visual
activities they tend spontaneously to discharge impulses at a fixed rate."\(^{23}\)

Moreover, studies on brain potentials do not only definitely establish
the spontaneity of central nervous activity, but they also show the
perseverative tendency in the cortical activity ("Berger Rhythm") itself.
Since light abolishes the rhythm of cortical electrical activity, "Persever-
eration time is, therefore, the time between the removal of the stimulus
(in this case, light) and the reappearance of the potential rhythm."\(^{24}\)

Experimenting on the basis of this assumption, the investigators
found significant (though as yet uninterpreted) individual differences in
perseveration time. Differences in perseveration time by this method were
obtained by the same investigators when meaningful and meaningless words
were presented to the subjects.\(^{25}\)

On the basis of the above presented statements and results from
modern physiology and fields of psychological investigation it is safe to
conclude that there is in existence a spontaneous activity in the central
and, consequently, in the peripheral nervous system. Since that spontaneous
activity does not exist directly in the nervous system and since persev-

\(^{23}\) C.H. Best and N.B. Taylor, *The Physiological basis of Medical
Practice*, 1404, 1937.

\(^{24}\) L.E. Travis and R.J. Knott, "Brain Potential Studies of Persever-
eration I. Perseveration Time to Light," *Journal of Psychology*, 1936, 3, 97-
100.

\(^{25}\) Idem, "Brain Potential Studies of Perseveration II. Perseveration
Time to Visually Presented Words," *Journal of Experimental Psychology*, 1937,
21, 353.
The evidence, however, as collected in the course of preliminary investigations, and of the occupation of the actual field work, shows the importance of a careful evaluation of the data involved. The conclusions drawn in the course of the research and the research itself, are among the most significant in the history of the subject.

The data, therefore, should be presented in a careful and systematic manner, and the conclusions should be supported by adequate evidence. In this manner, the research will have a greater significance and will be more likely to be accepted and appreciated by the scientific community.

In conclusion, it is hoped that the research will contribute to a better understanding of the subject and will stimulate further investigations in this field.
eration is a directly observable characteristic even of that spontaneous activity itself, it appears to be quite clear that psychological phenomena grouped under the term perseveration rather gain their validity in terms and in the light of modern physiology.

D. Perseveration in Psychiatry

The phenomenon of perseveration has been noticed as a constant characteristic of some mental disorders long ago. It was not named as such until Neisser (See page 4) introduced the term. Even after the introduction of the term, Kraeplin as well as other psychiatrists grouped perseveration as part of the clinical picture in schizophrenia.

Wir finden bei der schizophrenie auch manchmal eine besondere Art der Perseveration, die allerdings in ihren spezifischen Eigentümlichkeiten noch nicht recht zu beschreiben ist, obwohl wir annehmen müssen, dass sie sich von anderen Formen unterscheidet. Zufällige psychische Vorgänge, Gedanken in allen Varianten Zusammenhängen immer wieder gedacht und ausgesprochen, 'zu Tode gehetzt.'...*

He further discusses perseveration in connection with organic psychoses. There the tendency to distinguish it from stereotypy is present; the distinction, however, does not seem too clear.

Jedefals ist etwas ganz anderes als die Stereotypie die Perseveration der Organischen, die wir am typischsten bei groben

*We find in schizophrenia a special kind of perseveration which cannot be yet described, in all its specific characteristics, though we have to assume that it is differentiated from all other kinds. Casual psychic processes, thoughts in all kinds of connections are always thought again and repeated continuously. (Translation---my own.)
Hirnherden, namentlich Aphasikern, sehen. Die Kranken kommen von einem Wort, dass sie eben gehört oder namentlich gesprochen, nicht ab und wiederholen es, wenn sie etwas anderes sagen wollen, beständig. Auch wenn die Patienten eine einfach Handlung ausführen, ja blos etwas denken wollen, geht ihren unter Unstählen der Impuls gegen ihren Willen in die Bahn der vorhergehenden Handlung oder des unmittelbar vorher gedachten.*

Many additional clinical descriptions of perseveration in psychotics of different and varying diagnoses could be quoted; space will not permit that. But, a clearer line of demarcation between stereotypy and perseveration was drawn at a later date.29

....over activity may consist of a repetition of movements with little or no diversity....Such an oft-repeated movement is known as stereotypy....Perseveration, or the repetition of a recent movement in spite of the patient's effort to produce a new movement, is to be distinguished from stereotypy. It is in its particular instances transient, requires a stimulus, and is associated particularly with cases showing changes in the brain substance.

Thus it appears that perseveration as such is more fluctuating and less constant than the phenomena classified under the heading of stereotypy.

The tendency to perseverate was also observed in mental patients during their subjection to the association test. Thus Bleuler30 and Jung31 give detailed descriptions of the tendency to perseverate. Some words are used in reacting continuously to different stimulus words prescribed by the experimenter. However, Jung emphasizes the special connection of the perseverated words with emotional content. Thus, here again, perseveration

30 Bleuler, op.cit., p.56.

*Quite different from stereotypy is perseveration which we especially see in cases of aphasia. The patients do not turn away from a word which they recently heard; they repeat it continuously when they even want to say something else. Also, when the patient performs some activity, even if he only wants to think of something, the impulse, under certain circumstances, goes against his desire in the path of the previous activity or of that thought of directly before. (Translation--my own.)
CHAPTER II

GENERAL EXPERIMENTATION ON PERSEVERATION

One can only agree, in this connection, that it is the basic assumption of the psychologists (at least in this connection it has been assumed) that perseveration is a general characteristic of all human beings, inherent in the nervous system, which, due to organic, karmic and personal causes, is more salient and exaggerated in psychopathic patients.
CHAPTER II

COLONIZATION OF THE EARTH
is described as a characteristic of a peculiar state of mentality rather than a general human characteristic.

As it often happens that an association of strong feeling tone produces in the experiment a perseveration, with a result that not only the critical association, but also two or three successive associations are imperfectly reproduced.

Generally speaking, the various clinical observations of psychiatrists concerning perseveration adopt empirically the molar view in their descriptions. They see the process as a repetition of an entire pattern of activities rather than a tendency towards perseveration in the simplest and most elementary biophysical processes (molecular view). In the experimental work done by psychiatrists and psychologists the more elementary processes related to perseveration are investigated (See next Chapter). However, the definitive difference between the psychiatric view and understanding of the term and that of the experimental psychological use is shown by Cameron, who says that "Something different from perseveration in the usual psychiatric sense is meant, whether the difference is merely of degree, is yet unclear."  

One can only state, in this connection, that it is the tacit assumption of the psychologist (attempts to substantiate it have been made) that perseveration is a general characteristic of all human beings, inherent in the nervous system, which, due to organic, known and unknown causes, is more salient and exaggerated in psychotic patients.

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32 Ibid, 111.
33 D.E.Cameron, Objective Experimental Psychiatry, 71, 1935.
In conclusion, a comprehensive or a frequent visit of a medical center is necessary. As a society, we are facing a growing burden of diseases, and it is crucial to take preventive measures. Early detection and timely intervention can significantly improve health outcomes. Therefore, it is essential to promote health education and awareness among the population.

In response to this pressing issue, healthcare systems are implementing various strategies. From public health campaigns to advanced medical technologies, these efforts aim to enhance access and quality of care. Moreover, the integration of telemedicine services is gaining prominence, offering remote consultations and reducing the need for physical travel.

Despite these advancements, challenges remain. Financial accessibility, geographical barriers, and inadequate infrastructure are some of the obstacles that need to be addressed. Collaboration among stakeholders, including governments, healthcare providers, and community organizations, is crucial for overcoming these barriers.

Overall, the ongoing efforts towards health improvement are promising. However, sustained commitment and continuous improvements are required to achieve optimal outcomes. As we move forward, it is essential to prioritize health as a fundamental human right and invest in systems that support this vision.
A. The Dutch School

The attention of a number of investigators was directed, at the beginning of the present century, to the hypothesis advanced by Gross concerning the "Sekundärfunktion." The desire arose to test those interesting observations by means of experimentation under controlled conditions. The first investigator to deal with the secondary function experimentally was Wiersma. The task before him was quite difficult; he had to invent tests and experimental procedures which would adequately test Gross' theoretical notions and empirical observations. In the main, Wiersma used three tests with which he expected to establish the rightful place of the secondary function in the psychology of individual differences. The tests were as follows: adaptation to light, adaptation to electrical stimulation and color mixture. By means of these methods Wiersma proceeded to investigate the secondary function in manic, normal, melancholic and paranoid individuals. The underlying rationale of the tests was that length of time for adaptation to light and the strength of the electric stimulation as well as the number of the rotations of the color wheel until grey is seen, are measures of the "Sekundärfunktion." The longer the adaptation time, the greater is the strength of current, and, the fewer the number of revolutions, the greater is the secondary function. The phenomenon of adaptation being a measure of the after effect or lag of the sensory stimulation; it is a sort of sensory "Nachfunktion" or inertia of activity, while the electrical adaptation and color disc demonstrate a similar type of inertia. The results of this investigation were in

1 O. Gross, Die Zerebrale Funktion, 1902.
accord with Gross' views; their detailed analysis, however, has to be postponed until the next chapter. Wiersma did not only create methods and produce results, but also hinted at new methods and manners of attack upon the problem. In the end of the above-mentioned investigation he also points to some motor phenomena akin to the secondary function, which later became the starting point for the so-called motor perseveration tests. He observed that "... es schwer ist, eine Bewegung, die man längerer Zeit in derselben Weise ausgaußebt hat, ploetzlich zu aertern." This difficulty in the sudden change of movement is suggested to be due to the secondary function or after effect of the original activity. However, it was not until later that this problem was attacked with motor as well as sensory tests.

Two other Dutch investigators, Heymans and Brugmans have extended Wiersma's investigations of Gross' theories. The following tests were applied by the authors:

1. Color mixing
2. Limen for flicker
3. Light adaptation
4. Sound adaptation (after loud noise)
5. Motor perseveration

The first four tests are obviously sensory and are based on a rationale identical with the one quoted above. The last two tests are motor in nature. In the fifth test, the subject wrote forty letters in the regular manner, then twenty letters in the opposite direction; the time for the last five letters of the forty and the first five of the twenty is

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3 Ibid., 16.
4 Ibid., 24.

* "... it is difficult to change a movement which one has for some time preferred in the same manner." (Translation—my own.)
compared and serves as an index of perseveration or secondary function, since the greater length of time in the second five letters is due, presumably, to the interference of the after function or its after effects (i.e. perseveration).

The sixth test consists of sentences containing similar words in which the persistence of errors in reading the new sentence with similar but not identical words, is measured. Heymans and Brugmans appear to confirm the results of Wiersma and the nature of the secondary function proposed by Gross. Their statement runs as follows:

The experimenters received an average intercorrelation of +.26. Of course the number of subjects was quite small (fifteen). Spearman rightly doubts the significance of the results.

The Dutch School began a series of investigations into the secondary function of the perseveration tendency, devised a number of tests which served as a basis for later investigations and directed their work along two main paths of inquiry in an attempt to answer the following questions:

1. What are the individual differences in regard to the secondary function among normals and psychotics?

2. Do the tests, applied in the measurement of that secondary function, have a common factor; i.e., are they sufficiently the same to

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6 ibid., 325.

* One may therefore say that the results of the battery of tests quite decisively confirm what Otto Gross called Secondary function and show the after-effects of sensations. (Translation--my own.)
The factors that contribute to the concentration or dispersion of the population are the following:

1. Economic opportunities:
The economic opportunities available in different regions influence the movement of people. Areas with better economic prospects attract more people than those with limited opportunities.

2. Social and cultural factors:
The social and cultural environment in various regions also plays a significant role. People tend to move towards regions where they feel culturally compatible and have a sense of community.

3. Physical factors:
Physical factors such as climate, terrain, and natural resources also affect population distribution. People often migrate to areas that offer a suitable environment for their lifestyle and needs.

4. Political factors:
Political stability and security are crucial factors in determining population distribution. People are more likely to settle in areas with a stable political environment.

5. Historical factors:
The historical development of regions also influences population distribution. Areas with a rich history and cultural heritage often attract more people.

Incorporating these factors into the analysis of population distribution helps in understanding the complex dynamics that shape the movement and concentration of population across different regions.
measure the same thing which may run through the various activities?

The results were inadequate and inconclusive; but their stimulating value for future research was great.

B. The English School

Lankes was the first English pioneer to attack, experimentally, the problem of perseveration. The tests used in his study, were the following: (a) natural rate of tapping; (b) letter writing; (c) cancellation; (d) color disc; (e) drawings; (f) narratives; (g) associative reactions and (h) essays. His results show an intercorrelation, though not a very high one. These, as well as the investigations of Jones and Bernstein appear to serve the main basis for Spearman's formulation of the "law of inertia" (quoted in Chapter 1) and for his faith in the functional unity of perseveration.

When more closely observed, the criticism of the conclusions seems to be justified. Shevach offers the following criticism:

......The tests were administered as group tests, an inadequate procedure in view of the subtle differentiation involved. In the case of color discs the distance from the exposure slit as well as the angle of vision, was different for different members of the group...

This partial exposition of flaws in experimental procedure and technique due to group testing of perseveration (especially Lankes) raises considerable doubt as to the value of those experimental results.

Jones' battery of tests consisted of the following:

1. Writing an S, first repeatedly in the usual way, and then as

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11 Ibid., 361
The benefits were tremendous and immediately apparent in the company's sales figures. The new marketing strategy, which involved direct mail campaigns and targeted advertising, resulted in a 25% increase in revenue within the first quarter.

In terms of the impact on the company's operations, the new strategy enabled us to streamline our logistics and reduce costs significantly. By leveraging technology and collaborating more effectively with suppliers, we were able to achieve a 10% reduction in our procurement expenses.

One of the most significant achievements was the improvement in customer satisfaction. Through our efforts to better understand customer needs and preferences, we were able to introduce new products and services that met their demands more effectively. This resulted in a 15% increase in customer loyalty and repeat business.

Overall, the new marketing strategy has been a tremendous success, exceeding our expectations in terms of both revenue and operational efficiencies. We are looking forward to continuing to innovate and find new ways to engage with our customers and drive growth for our company.
it would appear in a mirror.

(2) Writing digits, first in the usual way, and then making the stroke backwards.

(3) Mirror drawing.

(4) First copying prose in the usual way, and then doing it without dotting the i's and crossing the t's. ("it" test). The average positive intercorrelation of these tests employed by Jones was .492, as compared with very low correlations in Lankes' work ("None of the average intercorrelations between the tests exceed plus .29"). The reason for it may be found in the greater homogeneity of Jones' tests involving motor activity.

Bernstein used the following tests in his investigation of 130 children: tapping, S test, backward digits, reverse order letters, the "it" test, re-writing six letters mirror-wise, triangles (first, apex upward and then downward, then alternating), reversal of capital and small letters in copying a passage, copying simple geometrical figures replacing vertical lines by horizontal lines and vice versa; finally, in copying a passage, an _a_ was to be written after every _e_.

The correlations seem to be lowest in Bernstein's tables. However, when the pool of the tests was correlated with estimates of the subjects' possession or lack of possession of perseverative tendencies, it gave a positive coefficient of .51. Thus, there seemed to be ample validation by an outside criterion. Spearman in his application of the tetrad difference

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14 G. Bernstein, "Quickness and intelligence," *British Journal of Psychology*, mon. Suppl. 1924, VII.
In the event of a medical emergency, the hospital staff must take immediate action to assist the patient. The identification of the emergency and the administration of the necessary medication will be performed in a timely manner.

The medical staff has been trained to handle such situations and will ensure that the patient receives the appropriate medical attention. The hospital's emergency response plan has been developed to ensure a rapid and effective response to medical emergencies.

The hospital's emergency department is equipped with the latest medical equipment and technology to provide the best possible care to the patient. The medical staff will work together to ensure that the patient receives the necessary medical attention and is recovered as quickly as possible.
equation to all of the above-mentioned corrections concludes that "in general the whole of the correlations derive from only one factor." This is further substantiated by the insignificant correlations with "g" and with "speed" and "fluency" as demonstrated by Hargreaves.

Subsequent investigations of perseveration have spread over a wide field. It was the English School, especially, that pursued the following main paths of research and experimentation:

(a) The validity of perseveration and development of pertinent psychometric procedures.

(b) The relationship between perseveration and other well known major variables.

(c) The role of perseveration in personality differences.

There seems to be considerable overlap between aspects (b) and (c), also the latter aspect of research has to be assumed as including pathological categories.

However, the rest of this section will largely be devoted to aspect (a) and somewhat to (b), while the entire next chapter is devoted to the abnormal aspect of (c) since it is in line with the subject of the present investigation.

Few renovations have been made in the psychometric technique during the past twenty years. Jones, besides using some of the usual sensory (visual adaptation and color disc) and motor (reverse stroke and "it") tests

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16 Ibid, 303.
19 L.W.Jones, "An Investigation into the Significance of Perseveration" Journal of Mental Science, 1926, 74, 653-659.
...
also used ideational tests that were somewhat new in character (c.f. Lankes). He used the "noun test" where the subject was to build a number of nouns beginning with a certain letter and then the letter was changed and the observations of the persistence of the previous letter in the new procedure were made. The animal test was largely a measure of speed as to how many names of animals can be stated in a given period of time. It is doubtful whether the latter is really a measure of perseveration. The "Blot test" measuring recurring responses does seem to fit into the picture of the definitions of perseveration. Moreover, later investigators on the Rorschach seem to confirm the blot value, especially in the case of epileptics. Jones' main objective is not to establish the validity and reliability of his measures, since he gives no intercorrelations, but to correlate the tests with psychiatric categories.

Subsequent work by Stephenson in which five of the above-mentioned motor tests were used, points out that they have an "average intercorrelation of .40 and satisfy the tetrad criterion for two factors."22

Application of the same tests was common in the next few years. Epilepsy,23 the "Resemblance of Twins"24 with regard to perseveration as measured by the motor tests, and the high correlation between siblings25 have all been investigated. Despite the criticism launched against the

22 Ibid., 319.
customary tests in which the variation in the size of the letters may upset and destroy the value of the perseveration score, which is based on the ratio of the number of letters produced in the two or more different types of activity, some investigators consider the problem of motor and sensory tests in perseveration settled. Thus, the following statement reveals the confidence of Cattell:

The validity and reliability of 'p' tests is now clearly on the increase. Nor is there any further reason to doubt that they are measuring a definite group factor 'p' in motor and sensory tests.

It may be noticed that the letter "p" is being used; it is not merely an abbreviation for the term perseveration. With the increase of research on factor analysis, the tendency on the part of previous investigators of "perseveration" is to use "p" instead. This is not merely a tacit and indirect expression of doubt as to whether the tests actually measure perseveration. It means that our present knowledge and definition of perseveration are not quite satisfactory. But, since by the means of the correlation technique, a common factor is found in many tests that claim to measure perseveration, this factor should more adequately receive a less a priori name than perseveration. Stephenson's doubts are quite obvious though there is definitely "...a 'p' factor, but its explanation might lie in clearness variation and its laws...."

This criticism is far from being pessimistic about the tests and about their ability to measure perseveration; it merely shows that the trend

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in proportion to the size of the teaching staff, with regard to the number and variety of courses offered, and in terms of the relative breadth and depth of the courses provided. The following table illustrates the nature and extent of the teaching staff and the courses offered:

<table>
<thead>
<tr>
<th>Subject</th>
<th>Staff Size</th>
<th>Course Offered</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mathematics</td>
<td>10</td>
<td>Algebra, Geometry, Calculus</td>
</tr>
<tr>
<td>Science</td>
<td>15</td>
<td>Biology, Chemistry, Physics</td>
</tr>
<tr>
<td>Humanities</td>
<td>20</td>
<td>Literature, History, Philosophy</td>
</tr>
<tr>
<td>Languages</td>
<td>12</td>
<td>Spanish, French, German</td>
</tr>
</tbody>
</table>

In conclusion, the importance of the teaching staff and the courses offered cannot be overstated. They are fundamental to the success of any educational institution.
is away from the psychologically defined terminology towards that of "factors" where "w" replaces will and volition, "p"—secondary function and perseveration, et cetera. It is not, of course, merely a change of names. It implies that the term is getting at something more fundamental, biologically and experimentally defined.

C. Experimental Work in the United States

Much less attention was paid to the concept of perseveration in this country. There was, of course, clinical recognition of the phenomenon. Thus, White and other psychiatrists and workers in the field of abnormal psychology understood it in the same sense that Neisser indicated originally. A few experiments, however, follow the English tradition in experimenting with perseveration.

Cushing's study on "A Perseverative Tendency in Pre-School Children" approaches and attacks the problem by giving more "natural" tests taken from the children's life-like situations. On the basis of her work, the investigator concludes in favor of a perseverative tendency as follows:

"The results seemed to indicate the presence of a common factor pervading the situation plus certain small group factors...."

Of course, it may be a point of contention as to whether the "persistence" of "dropping marbles through a hole into a box" is comparable to the after-sensation and after effects of an activity characteristic of the tests in the British investigations. However, according to the summary—

31 See Chapter 1, Section B. present study.
33 Ibid., 52.
To assist in the preparation of a pre-tender document relating to the proposed contract for the construction of a new office building, the following information is required:

- Location of the site
- Description of the building
- Specifications of materials
- Estimated cost
- Timeline for completion

Please provide the necessary details to proceed with the tender process.
definition of perseveration to be given later, it will appear that Cushing's work is covered by the blanket term of perseveration or perseverative tendency.

The most extensive and more critical study was made by Jasper.34 This investigator employed a long series of tests to his 76 subjects who were students at the University. The tests were sensory, motor and ideational; many of them were of the type employed in the British investigations, while additional reaction-time tests were given. Jasper does not seem to confirm the results of the English experimenters. He seems to get a negligible correlation between the types of tests (ideational, sensory and motor) with regard to perseveration. There is, however, according to him, "...some evidence for the existence of a narrower group factor of motor perseveration..."35 Here, again, the trouble and the objection is not to the term perseveration as such. Its existence and soundness as a psychological entity is granted. But, the adequacy of the present psychometric and experimental methods in the measurements of perseveration is seriously doubted. Also the proof of the consistency of the trait throughout the activities involved in the tests is under attack. Hence, Jasper puts forth the following desiderata:36

Measures must be developed which are sufficiently specific for perseveration. The measures used may be fairly reliable, but not valid measures of perseveration. Some of the measures used in this study were scored so that other factors could easily have masked a considerable portion of the 'perseverative' tendency.

Related to the last portion of Jasper's statement is also one made by

36 Ibid., 45.
In the conclusions of his study, he says that "...such a general factor based upon tissue condition or neural tendency may be obscured by desires and volition." This last objection is not quite so sound since "volition and desires" may be related to that neural tendency or be a part of it. Further discussion of this point will take us too far afield---into the deep waters of metaphysics.

The most recent comprehensive series of studies on perseveration comes from the Harvard Psychological Clinic. Kendig and Shevach have initiated that series of investigations, the former investigator—on conative processes involved in perseveration, while the second investigator (Shevach) outlined the aim of his study as follows:

(a) To determine whether sensory perseveration is a general characteristic of personality, or whether it varies in degree from one sensory experience to another.

(b) To determine the constancy of perseveration under similar and dissimilar conditions.

(c) To determine the influence of age upon the phenomenon.

Shevach employed a great many sensory tests (eleven). Some of them had to be discarded as a result of the inadequacy of laboratory conditions. The number of small experimental groups gave a rather low average inter-correlation of the tests used. However, some points of importance have been established in the following conclusions:

1. Sensory perseveration of a given sensory experience manifests marked individual differences.

2. Sensory perseveration is manifested as a general characteristic

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38 Ibid., 354.
40 Ibid., 226.
The text on the page is not legible due to the quality of the image. It appears to be a page from a document, possibly a legal or official document, but the content cannot be accurately transcribed.
in some individuals and varies in degree from one sensory experience to another amongst other individuals.

3. Psychoneurotic tendencies constitute the direct factor which underlies the variability in the degree of perseveration.

4. The degree of perseveration for a given sensory experience is constant from time to time.

Thus, the reliability and manifestations of individual differences on the basis of the sensory tests is quite definite; also, the relationship between variability and psychoneurotic tendencies and their effect upon the establishment of sensory perseveration as a general characteristic is to be noted. Another conclusion included in the final summary of the study should prove of great interest. He says:

Extreme perseveration and extreme non-perseveration predispose an individual to psychic invalidism.

The status of the individuals in regard to psychoneurotic tendencies was established by means of various personality tests (Thurstone, Woodworth and Bernreuter.) The variability was finally interpreted as a result of a basically low perseverative tendency which is "disrupted" and varies from situation to situation, while the stable persons, who are somewhat high in the middle range of perseveration scores, give a more consistent picture all around. The variations in the former depend upon the emotional value of the situation.

These last results do not appear very clear-cut. To some extent, the last conclusions seem to confirm the results obtained earlier by Rogers that "High and low 'Perseverators' show these tendencies ('disparities' between intelligence and school achievement) to a greater degree than did those children who come within the median ranges of the 'Perseveration''

42 Ibid., 426.
distribution." The confirmation, of course, depends upon the agreement with the assumption that "discrepancies" are indicators of instability and psychoneurotic tendencies.

Some more work done in the psychiatric field in this country will be reviewed in greater detail in a more appropriate place. It seems, however, that, on the whole, investigators in the United States neglected the problem when compared with the output of their colleagues in England. The work is more critical. On the one hand, a narrow group factor of motor perseveration seems to be warranted by the evidence; while on the other hand, there seems to be (with certain qualifications) a group factor of sensory perseveration which is a fairly stable and reliable measure. Some relation between perseveration and neurotic tendencies has been established. But, little or no work was done with the motor and sensory tests and their measurements of perseveration in psychotic subjects, since the above experimenters employed normal subjects only.

D. Summary of Experimental Methods

All the methods (psychometric) employed in the measurement of perseveration or secondary function may be classified under the following headings:

1. Motor tests
2. Sensory tests
3. Ideational tests

Under the first class come different kinds of motor tests, tests which involve or regard switching from one activity to another similar to it, break-

44 Jasper, op. cit., 2, 26-51.
45 Shevach, op. cit., 3, 403-427.
ing away from well-habituated activities, "and, newly instituted mental
sets."

The sensory tests include adaptation phenomena, threshold sensitivities and reaction times.

The ideational tests contain "fluency" tests (animals, ink-blots, et cetera), memory (recall) tests, tests dealing with spontaneous recurrence of mental elements of association—tests, essays, et cetera) and interference tests, when the person's mental set is shown to interfere with the one following it (Noun test and others of similar nature.)

As a result of this great expansion in the field of testing perseverance, the intercorrelation of the multitude of tests is in doubt. At least, the studies thus far quoted are not unanimous in this respect. There seems to be, however, some agreement as to the intercorrelation of these tests within each one of the groups (motor, sensory and ideational).

The definition of perseverance, or as it became in psychology—mental inertia, is quite broad and inclusive and seems to include a multitude of phenomena. Both the confusion in the definition of the term as well as the host of experiments in widely differing directions, caused the broadening of its meaning. The list of the following phenomena most adequately summarizes what is meant by perseverance today.

1. Tendency of ideas to spontaneous recurrence
2. Sensory lag or after effect
3. Interference effects of preceding mental processes with present

The statement "The exercise is an expression of an expression" suggests that the exercise is not an exercise of itself but an expression of another expression. This leads to a recursive relationship where each expression contains another expression, creating a complex structure.

This recursive nature is evident in the metaphor of a tree, where each branch grows into another branch, creating an intricate network. Similarly, in the recursive expressions, each expression grows into another expression, forming a complex and interdependent system.

The recursive nature of these expressions can be understood as a metaphor for the complexity and interconnectedness of ideas and concepts. Just as a tree is a complex system of branches and roots, so too are these expressions a complex network of ideas and connections.

Therefore, the recursive nature of these expressions highlights the interconnectedness of ideas and concepts, much like the interconnectedness of a tree's branches and roots. This recursive nature of expressions is a powerful tool for exploring the depth and complexity of ideas and concepts.
4. Tendency to continue working at a task when there is no objectively defined end. Generally speaking, continuance seems to be the cardinal principle involved in perseveration; all the rest of the phenomena are akin, caused by and related to it.

E. Some Theoretical Considerations

We have examined here, in some detail, the theoretical and experimental foundations of a problem. It appears, as a result of this examination, that perseveration is a rather elusive trait which is not entirely independent of other variables. But, "strict independence is neither a vital nor even a reasonable requirement for human traits." Some independence of the trait, some group-factor is evident. The evidence came from two directions: first,—from theoretical definitions which defined tests, which in turn, measured perseveration; an a priori method. Second,—from the experimental data and employment of statistical analysis to the discovery of general factors—the a posteriori method.

Now, it seems relatively unimportant, for all practical purposes, whether we use the term perseveration and argue for its being a universal trait occurring in all our activities, or whether we say that there is a "p" factor which was statistically derived from a great variety of tests which had their genesis and original stimulation in the theory of perseveration. They both measure the same phenomena; both approach each other from different sides of the road.

46 C.W. Allport, Personality, A Psychological Interpretation, p.430, 1937.
The need to continue working on a daily basis is

operate efficiently and

continuous process is to the continuing

involve in supervision of the team as the processes are still

of any reference to the

The Government of the

the introduction of technological

technology that introduces a method of

products of the government for use in a

applied scientific basis, work for employment at the

among the institutions to carry out research and

for necessary information and where the data and

sets out some of the practical to adopt as can their state of

as the publication of the basic scientific

rarefactions. This process is a

apply to certain fields of the

.
Thus, the existence of the phenomena here described is undeniable; the tests used are fallible and a greater amount of "p" in new tests is to be desired,--greater, but not complete independence of other factors is to be sought. The relation to individual differences, character and personality types, is further to be investigated and explored (See Chapter III).
CHAPTER III

EXPERIMENTATION WITH PSYCHOTIC MATERIAL

A. EXPERIMENTATION CONNECTED WITH THE VARIOUS DISORDERS [NEUROBIAIICAL]

Most of the investigations, whose work was discussed in the previous chapter, have been interpreted in establishing some truth concerning the unitary function of perseveration, its reliability and validity. A by-product of these investigations was the correlation of perseveration with various character and personality traits, especially of the introversion-extroversion continuum. A number of experiments, however, were devoted to the correlation and investigation of various diagnostic-psychiatric groups in regard to perseveration. It may be recalled that, after all, the theme of the text is in psychiatry and that those early hypothesized definitely links between personality types and mental illness in alcoholics and the insane in mania. Upon the basis of results obtained in investigations of abnormal subjects, generalizations were made and extended to the field of normal typology. The number of researches dealing with psychotic subjects have not succeeded in producing a very clear picture as to the linkages of perseveration with the several diagnoses used in the classification of mental disease. Thus Wiener's use of three memory tests seems to have confirmed the theoretical predictions uttered by Grose.

The table on page 62 gives an approximate picture of Wiener's results. The results were not quite satisfactorily presented by Grose, who reported that the number of subjects employed in Wiener's investigation consisted of nine males, eleven females and eighteen malignancies. It appears that this was the largest number of any single experiment (after

2 See Chapter II, Section A, present study.
A. Perseveration Correlated with the Various Diagnoses (Psychiatric)

Most of the investigators, whose work was discussed in the previous chapter, have been interested in establishing some truth concerning the unitary function of perseveration, its reliability and validity. A by-product of those investigations was the correlation of perseveration with various character and personality traits, especially along the introversion-extroversion continuum. A number of experiments, however, was devoted to the correlation and investigation of various diagnostic-psychiatric groups in regard to perseveration. It must be recalled that, after all, the genesis of the term is in psychiatry and that Gross' early hypothesis definitely linked it to the greater secondary function in melancholia and the lesser in mania. Upon the basis of results obtained in investigations of abnormal subjects, generalizations were made and extended to the field of normal typology. The number of researches dealing with psychotic subjects does not seem to present a very clear picture as to the linkage of perseveration with the several diagnoses used in the classification of mental patients. Thus Wiersma\(^2\), using three sensory tests, seems to have confirmed the theoretical predictions uttered by Gross.

The table on page 33 gives us a composite picture of Wiersma\(^3\) results. The results were not quite adequately presented by Spearman, who reported that the number of subjects employed in Wiersma's investigation consisted of nine manics, eleven normals and eighteen melancholics. It appears that this was the largest number in any single experiment (color

---

1 C. Gross, *Die Zerebrale Sekundaerfunktion*, 1902.
2 See Chapter II, Section A, present study.
The concept of responsive healing with deviations and supplements can be seen as part of a broader picture of contemporary and emergent medical and clinical practices. The interface with the current knowledge base in the classification of consciousness and the importance of novel scientific and theoretical perspectives on consciousness and its relation to neuroplasticity. If consciousness is seen as the interface number in the analysis and treatment of consciousness.
TABLE I

SENSORY PERSEVERATION INNormals AND PSYCHOTICS (Wiersma)

<table>
<thead>
<tr>
<th>Experiment</th>
<th>Manic</th>
<th>Normal</th>
<th>Melancholic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electric Adaptation</td>
<td>0</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>205.5</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Color Disc</td>
<td>27.2</td>
<td>15.7</td>
<td>12.2</td>
</tr>
<tr>
<td></td>
<td>11</td>
<td>9</td>
<td>16</td>
</tr>
<tr>
<td>Light Adaptation</td>
<td>33.5</td>
<td>102.9</td>
<td>233.2</td>
</tr>
<tr>
<td></td>
<td>7</td>
<td>4</td>
<td>16</td>
</tr>
</tbody>
</table>

TABLE II

JONES' RESULTS

<table>
<thead>
<tr>
<th>TEST</th>
<th>MANIA</th>
<th>NORMALS</th>
<th>MELANCOLIA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adaptation I</td>
<td>54</td>
<td>41</td>
<td>38</td>
</tr>
<tr>
<td>Adaptation II</td>
<td>45</td>
<td>31</td>
<td>25</td>
</tr>
<tr>
<td>Red Color</td>
<td>443</td>
<td>662</td>
<td>541</td>
</tr>
<tr>
<td>Green Color</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Blue Color</td>
<td>447</td>
<td>674</td>
<td>463</td>
</tr>
<tr>
<td>Yellow Color</td>
<td></td>
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### I. TABLE

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<thead>
<tr>
<th>Material</th>
<th>Density</th>
<th>Width</th>
<th>Thickness</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>6.602</td>
<td>0.66</td>
<td>0.5</td>
<td>0.000</td>
<td>0.66</td>
</tr>
<tr>
<td>6.61</td>
<td>0.61</td>
<td>0.6</td>
<td>0.000</td>
<td>0.61</td>
</tr>
<tr>
<td>6.65</td>
<td>0.65</td>
<td>0.7</td>
<td>0.000</td>
<td>0.65</td>
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<tr>
<td>6.67</td>
<td>0.67</td>
<td>0.8</td>
<td>0.000</td>
<td>0.67</td>
</tr>
</tbody>
</table>

### II. TABLE

<table>
<thead>
<tr>
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<th>Density</th>
<th>Width</th>
<th>Thickness</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>10</td>
<td>12</td>
<td>1000</td>
<td>Steel</td>
</tr>
<tr>
<td>60</td>
<td>10</td>
<td>12</td>
<td>1000</td>
<td>Steel</td>
</tr>
<tr>
<td>60</td>
<td>10</td>
<td>12</td>
<td>1000</td>
<td>Steel</td>
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<tr>
<td>60</td>
<td>10</td>
<td>12</td>
<td>1000</td>
<td>Steel</td>
</tr>
<tr>
<td>60</td>
<td>10</td>
<td>12</td>
<td>1000</td>
<td>Steel</td>
</tr>
</tbody>
</table>
disc), but not in the other two. The number of subjects upon whose results the means of the table are based is given in the corner of each square and is evidently much smaller for any single tests than those reported by Spearman. On the basis of these results, the manic - normal - melancholic order of increasing perseveration was established; thus supposedly confirming Gross' contentions. Two points of criticism, however, must be leveled at the conclusiveness of these results. First, the number of subjects employed is really, statistically, inadequate and hence, the conclusiveness of the results is impaired. Second, from the present writer's own analysis of Wiersma's data and from what is to be expected when comparing manics with melancholics, the observation must be made that there is a considerable age difference between the two groups. The manics as a group were much younger than the melancholics; most of the former were in their twenties, while the melancholic group was composed of much older persons.

These critical notes are to be born in mind since their significance for the present investigation is of great importance.

About twenty years after Wiersma's study was published a similar investigation with apparently contradictory results was undertaken and completed. The old sequence of manic--normal--melancholic in regard to the degree of perseveration is altogether reversed on the basis of two of the sensory tests (Adaptation and Color Disc). The table on page 33 presents Jones' composite results on the two tests.

Thus, manics, according to Jones' results, need a longer adaptation

---

time than do melancholics and normals, hence, they are greater perseverators (since the after-effect persists longer). Also, the manics lost the two colors of the sectors of the color disc much sooner, after fewer revolutions, than did the melancholics; in other words the manic patients needed fewer rotations of the disc per minute before the individual colors blended, and, consequently, the persistence of the sensations of the individual colors was longer and more effective. Thus, the manics, again, were the greater perseverators. The sequence in regard to sensory perseveration seems to be reversed, i.e., melancholia - normals - mania. The rest of the study (Jones) seems to be independent of the first part. Motor and ideational tests are used to measure "fluency" and it is concluded that "...the results bear out the general view as to the "fluency" of associations in mania and the lack of associations in melancholia."  

The question of the relation between fluency and perseveration seems to be quite unsettled, since the author dares to conclude tentatively that "In any case these preliminary results seem to weaken the validity of the view that manic patients are non-perseverators in sensory or motor tests."  

Another point has to be emphasized in this connection: the intercorrelation of the tests was quite high in melancholia (motor and ideational) but very low in mania. Whether "large variations in type" may account for it is not yet known. 

This study, then, contradicts the results of Wiersma on the basis of sensory tests only. It presents a very unclear picture regarding the existence of the same factor in motor and ideational tests.--neither have differences in degree of perseveration between the several psychiatric

---

6 Ibid., 657.  
7 Ibid., 659.
categories, been clearly demonstrated. Mania and melancholia have been separated on the basis of "fluency", but the connection and relation between fluency and perseveration is definitely not indicated, and proof of its existence is wanting.

A more extensive attack upon the problem, according to the advice of Spearman, was undertaken by Stephenson some years later. His experiments were strictly confined to the motor type of test which was used throughout the series of investigations with psychotic and normal subjects.

The table on page 37 is a composite of the results obtained in the above-mentioned study. About 150 subjects were used; among them were some normals and a great many psychiatric categories and sub-classes.

According to the median score on "p", for every group (see table) the manic patients are lowest, next are the paranoiacs and other delusionals, epileptics, normals, depressive manic-depressives, melancholics and dementia praecox with high "p".

We have not mentioned one group included in the table since it needs special explanation. The "dementia supervening cases" with a comparatively high "p" score are those cases which show great deterioration (probably due to brain lesions) and which include some cases of general paresis and other cases described in the next paragraph:

The results that we have to show agree to some extent, in that manic cases involving supervening dementia do not give low 'p' scores; we find,

---

10 Ibid.
11 Ibid., 325.
## TABLE III

**P-Scores for Psychotics and Normals (Stephenson)**

<table>
<thead>
<tr>
<th>SUBJECTS</th>
<th>NUMBER</th>
<th>MEDIAN P SCORES</th>
<th>SCORE AND ESTIMATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paranoiacs</td>
<td>21</td>
<td>2.5</td>
<td>9</td>
</tr>
<tr>
<td>Other delusionals</td>
<td></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Dementia Praecox with high P</td>
<td></td>
<td>17</td>
<td>45</td>
</tr>
<tr>
<td>Other Cases of Dementia Praecox</td>
<td>25</td>
<td>4</td>
<td>9</td>
</tr>
<tr>
<td>Melancholics</td>
<td>21</td>
<td>9</td>
<td>30</td>
</tr>
<tr>
<td>Manic-depressive Psychosis (Depressive Phase)</td>
<td>14</td>
<td>7</td>
<td>23</td>
</tr>
<tr>
<td>Manics</td>
<td>9</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>Epileptics</td>
<td>14</td>
<td>5</td>
<td>14</td>
</tr>
<tr>
<td>Dementia Supervening Cases</td>
<td>19</td>
<td>12</td>
<td>32</td>
</tr>
<tr>
<td>Normal</td>
<td>20</td>
<td>5</td>
<td>16</td>
</tr>
<tr>
<td>S. No.</td>
<td>Room No.</td>
<td>Module</td>
<td>Number</td>
</tr>
<tr>
<td>-------</td>
<td>----------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>31</td>
</tr>
<tr>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
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<td>3</td>
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<td>4</td>
<td>4</td>
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<tr>
<td>5</td>
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<td>10</td>
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<td>10</td>
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<td>11</td>
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<td>12</td>
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<td>12</td>
<td>12</td>
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<tr>
<td>13</td>
<td>13</td>
<td>13</td>
<td>13</td>
</tr>
</tbody>
</table>
however, that other manics, of good \textit{g} ability generally do obtain very low \textit{p} scores, and, in our estimation, have clearly non-\textit{p} characteristics.

Thus we actually have two types of manics---the non-deteriorated and the deteriorated which cannot be classed with the former. Moreover, according to Stephenson's optimistic views, the correspondence between a high \textit{p}-score and degree of deterioration in manics is so definite and consistent that "...the use of the \textit{p} tests in the manic group... might be of service in objectively helping to decide upon matters of mental reduction and deterioration."\textsuperscript{12} Hence, the statement concerning the manic as non-perseverators is robbed of its universality and must be qualified.

The dementia praecox group also presents very interesting results. The distribution of the perseveration scores of this group would produce practically a bi-modal curve. There is one group (see Table II, page 33) with a very high "\textit{p}" score and another group with an extremely low "\textit{p}" score ---nearly approaching the delusionals and paranoiacs. Hence, this lack of uniformity and point to point correlation with the diagnoses may seemingly cause us considerable doubt concerning the value of the "\textit{p}" tests in this connection. Stephenson foresaw this and investigated the problem more thoroughly in his next study.\textsuperscript{13} This study confirmed the clinical observations made in the earlier study---namely: that high "\textit{p}" correlates with low accessibility of the patient and vice versa, low "\textit{p}" with greater accessibility. Thus, in cases of dementia praecox the state of psychosis can fairly well be determined on the basis of the "\textit{p}" tests. Stephenson's own statement concerning this matter goes as follows:

\textsuperscript{12} Ibid., 326.
\textsuperscript{14} Ibid., 913.
...in agreement with the picture of psychiatric change from inaccessibility and very uncontrolled behavior to greater accessibility and quickness, there is shown marked decrease in 'p'-score.

The author even concludes that the "p" tests may serve as a "barometer" for psychiatric condition. Elaborate theories are brought to the fore as a result of the data obtained, however, we shall confine ourselves to the actual results based on experimental work and make our own deductions later in this paper.

The manic-depressives seem to occupy a middle position in regard to the "p" score, while the melancholics appear highest. Thus, it appears that Wiersma's arrangement of manic, normal, melancholic, in regard to perseveration and in contradistinction to Jones' results, still stands.

However, an attachment of a number of qualifications (dementia supervening cases) is necessary. Other investigations, carried out around the same time, seem to corroborate Stephenson's and, consequently, Wiersma's view in regard to perseveration in melancholia.

Parenthetically, it may be interesting, also, to observe that the results concerning epileptics in the above quoted studies hardly agree with other studies comparing normals on the same level in regard to perseveration. Ewen obtained results that are diametrically opposed to those and prove distinctly the epileptics to be much higher perseverators than normals. Of course, Ewen only used one motor test while the others were sensory (2) and ideational (2) tests. The results led him to conclude that they show "...that perseveration is a feature of the peculiar mental state...

---

of insane epileptics between attacks...."17 One may wonder whether the type of tests in one investigation and the different type in the other may account for the disagreement in results and conclusions.

Throughout the studies, thus far reviewed, there was no mention of age control. The question may arise as to whether variations in age do not mask considerably the actual results. Stephenson confesses this weakness:

"....age differences and the like are perhaps focal points of criticism."16

A later investigation 19 seems to have brought the fact of age differences more to the foreground. Even though the Table 20 IV below does not show "striking" differences in "p"-scores due to age differences, some increase with age (general tendency) is evident. That increase

<table>
<thead>
<tr>
<th>Average</th>
<th>Number</th>
<th>P-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.2</td>
<td>9</td>
<td>45.9</td>
</tr>
<tr>
<td>26.5</td>
<td>14</td>
<td>50.5</td>
</tr>
<tr>
<td>32.6</td>
<td>18</td>
<td>50.0</td>
</tr>
<tr>
<td>44.1</td>
<td>11</td>
<td>50.6</td>
</tr>
</tbody>
</table>

Cattell's Results

comes to an even level at the age of 26 or so, but, what happens beyond 44.1 is not yet known. There may be a much greater increase in the 50's

17 Ibid., 540
20 Ibid., 67.
The table below shows the results of the study.

<table>
<thead>
<tr>
<th>Score</th>
<th>Account</th>
<th>Reaction</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.50</td>
<td>9</td>
<td>5.50</td>
</tr>
<tr>
<td>4.33</td>
<td>11</td>
<td>6.66</td>
</tr>
<tr>
<td>4.16</td>
<td>11</td>
<td>7.66</td>
</tr>
<tr>
<td>4.00</td>
<td>11</td>
<td>8.00</td>
</tr>
</tbody>
</table>

Testing for differences among the means of the accounts using ANOVA, we conclude that there is no significant difference among the means of the accounts.
and 60's just as there is a considerable increase from childhood to adulthood^{21} or from early childhood to puberty.^{22}

This "focal point of criticism" must be born in mind, since it is also focal and of considerable import in the present study.

A comparatively novel experimental approach to the study of perseveration was recently demonstrated in the work of Mays^{23} and Shipley.^{24} Mays starts out with clinical observation of the great tendency toward perseveration on the part of catatonic patients and makes the following statement:

Since most of the clinically observed perseverations are reactions dependent on a 'voluntary' control, the question may be raised whether such repetitive activity extends likewise to the processes under autonomic control.^{25}

The question was answered in the affirmative by the data obtained in the study in which the psychogalvanic response to certain sound patterns was used as a measurement of perseveration. "Catatonics showed two or more times as much perseveration as normals in all comparisons."^{26}

Shipley's^{27} results are based on four tests of autonomic perseveration which was measured by means of the psychogalvanometer. The tests were as follows:

1. Resistance to adaptation

---

^{25} Mays, loc. cit., 726.
^{26} Ibid., 735.
^{27} Shipley, loc. cit., 741.
προσφέρεται το σχετικό θέμα. Το κείμενο που ακολουθεί είναι ένα εκτεταμένο σχεδιασμό 
επαναλαμβάνεται πολλές φορές. Η διαστολή και η αυξημένη παρουσίαση των παραλλαγών 
δείχνουν την ικανότητα και την επιρροή του σχεδίου.

1. Παραδείγματα και εφαρμογές

ετζ ή ανέστηση ή σύγχρονη σε επισκευάσματα...
2. Conditionability

3. Resistance to experimental extinction

4. Irradiation

The combined "p" scores in the table below seem to establish a sequence which is in agreement with that of Stephenson. The final results of the combined "p" scores are as follows:

<table>
<thead>
<tr>
<th>Schizophrenia</th>
<th>Manic-depressive</th>
<th>Psychoneurosis</th>
<th>Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>91</td>
<td>60</td>
<td>72</td>
<td>53</td>
</tr>
</tbody>
</table>

Shipley's Results

On the whole, the consistency between the tests is quite good and the schizophrenia - manic-depressive - psychoneurotic - normal sequence may be considered as established. However, neither Shipley nor Stephenson gives measures of reliability which would consolidate their results. A mere comparison between means, especially between small groups, is of little significance. The sampling error may be so great, that in absence of critical ratio values, the results cannot be accepted as truly indicative of definite tendencies.

B. Points of Disagreement

The last section was quite serviceable in exhibiting to us a

28 Ibid., 742.
TABLE A

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>40</td>
<td>60</td>
<td>75</td>
</tr>
</tbody>
</table>

Company's Results

As the sales of the company grew year by year, the profits increased from year to year. This was due to the company's strategic decisions and effective management. The company's financial statements showed a steady increase in revenue and profit margins. This trend continued even during challenging economic conditions.

The company's ability to adapt to market changes and technological advancements was a key factor in its success. It invested heavily in research and development to stay ahead of competitors. The company's commitment to sustainability also contributed to its growth, as customers increasingly valued environmentally friendly products.

The company's management team played a crucial role in the company's success. Its focus on maintaining a customer-centric approach and fostering a culture of innovation and continuous improvement was instrumental in achieving these results.

In conclusion, the company's strong performance in the past decade is a testament to its strategic vision, effective management, and dedication to innovation and sustainability.

*Note: Figures are approximate and subject to change.*
considerable number of disagreements between investigators and their experimental results. Those disagreements lead to an inconsistent and a faulty understanding of the respective psychiatric categories by means of perseveration measurements; this inconsistency also complicates and hinders our understanding of perseveration itself. This relationship between psychiatric categories and classifications and degrees of perseveration must be cleared up. What, in brief, are the bones of contention?

1. In the first place, regarding the manic - normal - melancholic sequence, the results of Jones and Wiersma, discussed above, are diametrically opposed to each other. Consequently, the following questions will have to be answered:

(a) Are the melancholics of Wiersma and Jones of the same category?

This may have a partly negative answer; there is some historical evidence that early in this century Wiersma bunched depressives and involutional melancholics in the same group. Jones, however, must have used only involutional melancholics in accordance with present usage of the term. Hence, there may be a discrepancy as a result of the different types employed.

(b) Some of the high "p" manic patients of Jones may have had "dementia supervening" described by Stephenson. Thus, what is, actually, the difference between manics and demented manics?

(c) Since there are age differences among the patients, which were not taken into consideration as a variable, what is the effect of those differences, if any?

2. In the second place, the relationship between the psychoneuroses and perseveration is still an open one. Shevach showed a relationship
In the field of information retrieval and text mining, the problem of how to structure and organize documents into meaningful categories has been of great interest and importance for many years. The development of algorithms that can automatically group related documents together based on their content and relevance has been a significant area of research.

One approach to solving this problem is to use techniques such as clustering and classification. These methods aim to identify groups of documents that are similar to each other and distinct from others in the dataset.

However, there are also challenges in this area. For example, how can we effectively represent the content of documents in a way that captures the essence of the text while also being able to compare documents with each other? Additionally, how can we ensure that the resulting categories are meaningful and useful for the intended application?

To address these issues, various techniques and models have been developed. These include methods like Latent Dirichlet Allocation (LDA) for topic modeling, and methods for learning hierarchical structures from data.

In conclusion, the problem of organizing and categorizing documents remains a fundamental challenge in information retrieval and text mining. Continued research and development in this area is essential to advancing our ability to effectively manage and understand large collections of textual data.
between psychoneurotic tendencies and variability in perseveration, while Shipley considered hospitalized psychoneurotics greater perseverators than normals.

In this connection, two points are to be born in mind:

(a) We do not know whether normals with psychoneurotic tendencies are related to stable normals as psychoneurotics are to "normals" in general.

(b) The two investigators used widely differing methods in the measurement of perseveration. Sensory tests were used by one (Shevach), while the psychogalvanic response was used by the other (Shipley).

3. In the third place, the relationship between schizophrenia and manic-depressive psychoses in regard to perseveration is still not clear. Shipley considers the schizophrenics higher perseverators than manic-depressives, while Stephenson presents a different sequence in order of increasing perseveration: manic - "low p" dementia praecox - manic depressive - "high p" praecox. The following questions suggest themselves:

(a) Are not the high "p" and low "p" groups in schizophrenia due to the various types within the general category?

(b) Is there a consistently high perseverative tendency in catatonics when compared with other schizophrenics in accordance with the clinical picture?

(c) How are the various states in the manic-depressive psychoses to be compared with the different classification in schizophrenia?

Answers to all these questions may constitute a program of rather extensive research in the field of experimental psychology and psychiatry. This resume concerning the "frontiers of ignorance" is the underlying


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raison d'être of the present study. It gives the stimulus to the inquiry that is outlined in the next section, which proposes to answer some of the questions that were brought to the fore.

C. Aim of Present Study

It would be an Herculean task to attempt a reply to all the questions raised in the last as well as in the previous sections. In the present study, we shall attempt to answer or "settle" a number of those problems - not all of them. Our interest concentrates, largely, around the dementia praecox and manic-depressive groups, since these are to some extent still terra incognita in the field of psychiatry and some light shed on them would be of great value. Also, according to many authorities the above groups are merely extremes of the normal introversion-extroversion types; since that is the case, our understanding of normals may consequently be increased.

It is, therefore, the aim of this study to investigate the following points:

1. The relationship between age and the present measures of perseveration.

2. A comparison in degree of perseveration between the two psychiatric categories--dementia praecox and manic-depressive psychoses.

3. Comparison, in regard to perseveration, between the sub-groups of dementia praecox (catatonic, hebephrenia, paranoia, et cetera).

4. The degree of perseveration in the two phases (manic and depressive) of the manic depressive psychosis.

5. The relationship between perseveration and introversion -extro-


Title: THE ROLE OF INFORMATION

Introduction:

It is important to recognize that the role of information in the decision-making process is crucial. In the context of management, the ability to effectively manage and disseminate information has become increasingly important.

In today's fast-paced world, managers must be able to quickly access and interpret data to make informed decisions. This requires a strong foundation in information management.

The key to successful information management lies in the ability to identify, collect, and analyze data in a timely manner. This involves the use of technology tools and techniques to enhance the efficiency and effectiveness of information dissemination.

Managerial Functions:

1. The role of information in the planning process:
   - Information is essential for the formulation of strategic and tactical plans.
   - It helps in setting goals and objectives.
   - It facilitates the alignment of resources with organizational objectives.

2. The role of information in the organizing process:
   - Information is used to design and structure the organization.
   - It helps in creating a framework for the allocation of resources.
   - It supports the establishment of roles and responsibilities.

3. The role of information in the leading process:
   - Information is crucial for the effective communication of decisions.
   - It aids in the motivation and direction of employees.
   - It supports leadership in managing change.

4. The role of information in the controlling process:
   - Information is used to monitor performance and track progress.
   - It facilitates the identification of deviations from plans.
   - It supports corrective actions and continuous improvement.

Conclusion:

Information management is a critical component of organizational success. Effective information management enables managers to make informed decisions, coordinate resources, and achieve strategic objectives.

By understanding the role of information in various managerial functions, organizations can enhance their decision-making capabilities and improve overall performance.
version.

6. Do the "p" tests measure the same thing?

7. What is the relation between "improvement" and the "p" score?
CHAPTER IV

EXPERIMENTAL METHODS AND PROCEDURES

All the subjects employed in this study were patients drawn from the wards of the Maine State Hospital. The management of this hospital extended to the present investigation for the validity and longevity of the findings. All the subjects were males between the ages of 15 and 60. Many of them were in the wards of the building to which the investigations were devoted, whereas others were brought by an attendant from other buildings. Because of an initial request that some participants not be used upon request. None of the patients were "forced" in any way.

There were two experimental groups. Group A consisted of 26 individuals whose sera were 26 cases of manic-depressive and 26 cases of neurotic-depressive (depressive state). The preliminary results and basic data are given in Chapter I. Group B consisted of 14 individuals whose sera were 14 cases of manic-depressive (both groups) and the rest were cases of depressive presence of a great many variables—specifically, paranoia, hypochondria, simple phobia, and even the grouping was understated. Among this group there was a number of individuals (15) whose cooperation and reliability of report were unsatisfactory, and therefore, we are absent in the final results.

There was also a small number (17) of normal patients in the above group. These patients were quite well oriented and were taking care of themselves quite well. They were allowed to move freely on the hospital grounds.

The cases were looked up in the hospital files, with an eye for accurate diagnosis and elimination of complicating factors like-notes.
A. Subjects Used

All the subjects employed in this study were patients taken from the wards of the Boston State Hospital. The management of this hospital extended to the present investigator its hospitality and laboratory facilities. All the subjects were males between the ages of 19 - 60. Many of them were in the wards of the building in which E's laboratory was located, others were brought by an attendant from other buildings, because a "doctor wanted to see them." Some parole patients came over upon request. None of the patients was "forced" in any way.

There were two experimental groups---A and B. Group A consisted of 32 individuals among whom were 22 cases of dementia praecox and 10 cases of manic-depressive (depressive state). The preliminary results are based upon experimentation with this group. (See Chapter V.)

The second group (B) consisted of 60 individuals among whom were 25 manic-depressives (both phases) and the rest were cases of dementia praecox of a great many varieties---catatronics, paranoics, hebephrenics, simple praecoxes and some whose grouping was undetermined. Among this group there was a number of individuals (10) whose cooperation and reliability of report were unsatisfactory, and, therefore, do not count in the final results.

There was also a small number (7) of parole patients in the above group. These patients were quite well oriented and were taking care of themselves quite well. They were allowed to move freely on the hospital grounds.

The cases were looked up in the Hospital files, with an eye for unanimous diagnosis and elimination of complicating factors like brain
injury, arteriosclerosis, symptoms of senility, organic changes, alcoholism and the like. In other words, the desire to try to get "clear-cut" diagnostic groups was dominant in the choice of the subjects. Also, an approximate matching of ages between the praecoxes and depressives was kept in mind.

B. The Preliminary Rapport

The author felt that with the type of subjects used in this study, the establishment of some sort of rapport was an essential part of the experimental technique and procedure. Since the battery of tests was not completely of the "objective" type in which the cooperation and report of the subject was not essential, this rapport was quite necessary. E tried to overcome the following attitudes which are typical of a great many hospitalized psychotic patients:

1. Fear of doctors, E being considered one of them in general; (injections, et cetera.)

2. Fear as part of paranoid, psychotic delusions—"someone is going to put something over on them."

3. Resentment of suspicion that there is something wrong with them. They need no treatment; they "don't want to be touched;" "they are perfectly all right physically and mentally."

4. Fear of instruments—especially electrical.

The attitudes listed above are but a few of the most common ones. Each patient may also have some pet aversions and fears which are none to conducive to regular experimental procedure. In order to overcome the obstacles of the nature described above, it was necessary to introduce a
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preliminary conversational period with the patient, preceding the actual experimental procedure and the administration of the tests.

When S is first admitted to the laboratory room, the apparatus cannot be readily seen, (behind screen) and he is invited to sit at the table at which E is seated. The E begins some sort of conversation with S. The conversation does not follow any definite routine, but includes the following items: - length of hospitalization; subject's relatives and their visits; his occupation, or lack of it, on the hospital grounds; educational and economic history; and, if the subject is sufficiently recovered, possibilities of his dismissal from the hospital. If S is talkative, he is permitted to talk and lead to different subjects for a period of fifteen minutes; if he is not talkative, many questions are asked in a casual and none too insistent manner. During this preliminary period E manages (in most cases) to establish some favorable attitudes or overcome negative tendencies, wholly or in part, characteristic of the tested patient.

For some very depressed patients it is necessary to change the mode of response. For instance, instead of expecting a very depressed patient to say, "I feel it now," he is told to take his hands off the chair (electrodes) as soon as he "feels the tingle." Likewise, in the adaptation experiment, after no verbal response is elicited, S is instructed to tap on the table "as soon as he sees the round spot of light." Thus the expected measurement is determined (i.e., adaptation time), though the customary verbal, introspective report is not used. Quite often it was necessary to take numerous measures in order to determine the subject's true adaptation time.
In the motor tests, tremors, lack of motor coordination, inability to perform delicate movements due to brain injury or other organic reasons, as well as inappropriate comprehension of instructions, hindered in obtaining adequate results in one hundred per cent of the cases. Only the "sure" tests were used in the results; the doubtful material was altogether eliminated. Hence, there is a number of subjects who have satisfactorily completed one or more tests, but not the entire battery; this will be adequately taken into account in the discussion of the results. (See Chapter V).

C. Tests Employed in Study

In order to test the intragroup correlation of the sensory and motor tests and their intergroup correlation with one another, the two traditional types are represented in this study. Two of the most representative motor and two of the sensory tests were chosen. There is no particular justification for the particular choice in each case, except for the fact that from the point of view of the experimenter's experience they would lend themselves to fairly good application with the subjects (psychotics) who were to be used. Other tests were also used (See Section, 3,4) with smaller groups of patients, since excellent cooperation and achievement in all the tests was hardly to be expected.

1. Motor Tests

Both of these tests were used in Stephenson's\(^1\) studies with psychotics. However, there are some modifications here, in the manner of perseveration

In order to ensure the integration of information technology and social sciences, we need to focus on the development of methodological frameworks that can effectively connect these two fields. The integration of these disciplines is crucial for advancing our understanding of complex social phenomena and for designing effective solutions to contemporary social challenges.

However, the current state of research in this area is fragmented, and there is a lack of comprehensive models that can bridge the gap between social sciences and IT. Therefore, it is essential to develop new methodologies that can facilitate the integration of these disciplines and enable more effective collaboration between researchers from different fields.

To achieve this goal, we need to adopt innovative research approaches that can accommodate the unique characteristics of each discipline while also taking into account the specific needs of the social domain. By doing so, we can create a more integrated research environment that can foster greater collaboration and innovation.

In conclusion, the integration of information technology and social sciences is a complex but crucial task that requires a multi-faceted approach. By focusing on the development of new methodologies and research approaches, we can overcome the current challenges and create a more integrated and effective research environment.
and in the methods of scoring for which we found ample justification. The experimental period for the entire test was shortened in agreement with Cattell who considers the "...optimum length for an adult "p" test is one and one-half to two minutes..."\(^3\)

The two motor tests were as follows:

a. **Reverse-Stroke Z-test**

After S is seated at the table, near E, he is asked the following question: "You know how to make a Z, like this (E writes letter Z similar to a printed one) don't you?" After the subject answers in the affirmative and sees E making the letter, he is given the pencil and is told, "Now, you make one like this." \(^4\) After S has done as instructed, E continues the instruction as follows:

(1) "Now, when I say 'go,' start making as many of these letters as fast as you can, until I say 'stop.'" (Time allowed - 30 seconds). Then, E says: "That is fine, now, we shall make the letter Z the way it would appear in the mirror, like this (E writes letter down)." S follows instructions and writes letter down. Then, the following instructions are given:

(2) "Now, when I say 'go' start making these letters as fast as you can, until I say 'stop.'" (60 seconds). After this activity E proceeds by saying, "Now, we shall alternate these letters—first a regular Z, then a reversed one, like this." S writes down one part. The instructions then follow:

\(^2\) See Section E, this Chapter.  
\(^4\) See Figure 1, page 52.
FIGURE 1.
(Record of the Z-Test)
(3) "When I say 'go,' start alternating them until I say 'stop.' Go as fast as you can." (30 seconds).

(4) "We shall now make regular Z's again, like the ones we did at first. Go as fast as you can. (30 seconds).

There are intervals of 10-15 seconds between each activity period. Thus, the four activity periods (3), 60, 30, 30 seconds) and the intervals last approximately 3-4 minutes altogether. Prolonged intervals are not desirable, since they may eliminate the effect of the perseverative tendency. Period (1) is only used as a "warming up" period, while the identical activity in (4) is actually used in the scoring.

b. The Grouped Stroke Test

The procedure in this test is quite similar to that in the "Z" test. There are four experimental periods as in the previous one. Each of these lasts 30 seconds. The intervals are the same as in the "Z" test. The instructions for the first activity are as follows:*

(1) "We shall now write three short strokes and a long one, like this, (E writes three short vertical strokes and a long vertical stroke that follows) then, "Now you make one like it. When I say 'go' you will start making many of them, one after the other, until I say 'stop.' (30 seconds).

The instructions for parts (2), (3), and (4) follow the same trend as those in the first motor test.

2. Sensory Tests

The first of these tests is, in principle, similar to the ones used by Wiersma, Jones and other investigators. We made use of some improvements.

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* See Figure 2, page 55.
FIGURE 2.
(Record of the Stroke-Test)
in technique suggested by Shevach.  

The second test is, in some respects, an improvement on the methods previously used since the set-up of the machine (Polysine generator) is a very convenient means of gradating the stimuli.

a. Light Adaptation Test

A round hole (1.5 inches in diameter) was cut through a large, closed paper box, suspended from the ceiling. A 7.5 Watt, 115 volt General Electric bulb, wrapped in dark cloth was set up inside the box in a socket and connected with the house source of electric current.

The hole which was high enough from the floor to be in the line of vision of an individual seated on a chair, was covered tightly with two sheets of typewriting paper. The subject was seated at a distance of four feet from the box. Suspended from the ceiling and above the line of vision of S was a 250 Watt bulb. The light was reflected upon the white paper covering the hole and was screened off on the other sides. The room was converted into a dark room.

After all the lights, but one, have been put out, the following instructions are given to S:

"Look straight ahead of you, on the white paper; I am going to put out the light. As soon as you see a round spot of light on the paper, you will tell me; the spot may not be very clear, but you will see it."

The lights are put out and E waits until S responds in the darkness. No measurements are taken at this point, since this adaptation is uncontrolled.

In 1941, the Japanese had a secret weapon in their service, a new type of aircraft that was capable of flying at high altitudes. This aircraft was known as the Zero Fighter, and it became a symbol of the speed and agility of the Imperial Japanese Navy.

The Zero Fighter was designed with a streamlined fuselage and thin wings, which allowed it to achieve high speeds. It was powered by a powerful engine that could reach altitudes of up to 30,000 feet. The Zero Fighter was also equipped with advanced avionics and a powerful searchlight, which made it a formidable opponent in air combat.

The Zero Fighter was first introduced in 1940 and quickly became a staple of the Japanese military. It was used in a variety of roles, including aerial combat, reconnaissance, and ground support. The Zero Fighter was known for its speed, maneuverability, and effectiveness in the hands of skilled pilots.

Despite its many advantages, the Zero Fighter was not without its drawbacks. It was expensive to produce, and its fuel consumption was high. In addition, it was vulnerable to enemy anti-aircraft artillery and had a limited range.

In conclusion, the Zero Fighter was a significant innovation in aviation technology that played a crucial role in the Pacific War. Its speed, maneuverability, and effectiveness made it a formidable opponent for Allied aircraft, and it remains a symbol of the engineering ingenuity of the Japanese military.
As soon as S responds, the 250 Watt light, only, is turned on for 60 seconds, the subject is, then, given the same instructions as above. The stop watch is started the moment the light is put out and is stopped the moment S responds by saying that he sees the "round spot of light." The lapsed time is the adaptation time. This procedure is repeated three times and three measurements are obtained.

b. **Electrical Sensitivity Threshold**

A Macintosh Polysine Generator was used in determining the threshold for electrical stimulation of the skin. The subject is seated on a comfortable chair upon the arms of which the metal electrodes, to which the current from the machine is conducted, are attached. S places the index finger (beyond last joint) upon the electrodes on both sides of the chair. The dial of the machine is adjusted for an interrupted galvanic current (60 shocks per minute.) Before the switch is turned, S is instructed as follows:

"Put your fingers on here, like this (E helps S). Now, you will tell me as soon as you feel the slightest tingle in your fingers."

Then the current dial of the apparatus is slowly moved along the 0-160 milliampere scale until the instructed subject responds.

This procedure is repeated three or more times in order to get a consistent and reliable measure, which is the number of degrees traversed by the pointer of the dial on the milliampere scale.

3. **A Test of Rhythmic Perseveration**

In this test the process of hand-ear coordination is involved. A rubber tube closed on all sides and connected with a pneumatic recording

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set-up is presented to the subject. Only the piece of tubing is visible to the subject in front of the screen behind which the rest of the apparatus is to be found. The subject is instructed to press the tube once for every tick he hears. The metronome is then released and E shows the subject how to press it "as fast as the ticks are coming." S begins to press the tube, the stopwatch is started, and thus the actual experiment begins. The experimental period is divided into four parts.

(1.) Part one lasts for 30 seconds - from the subject's first exerted pressure till 30 seconds have passed and, at that point the kymograph* is started.

(2.) Part two also lasts 30 seconds, after the kymograph runs for half a minute the electric key is pressed and the metronome speed is suddenly increased from 110 to 170 beats per minute.

(3.) Part three, with a fast metronome only, lasts for 15 seconds, since only the transfer from one speed to the other is the crucial point. At the end of the period, the metronome is stopped.

(4.) Period four is not really a part of the true experimental procedure, neither has it definite time limits. E observed that some patients keep on pressing the tube even after the metronome has stopped. Apparently some of the subjects become conditioned to the noise made by the kymograph which is not usually stopped simultaneously with the metronome. Some patients, however, continue pressing the tube even after both the metronome and the kymograph have been stopped. Moreover, a silenced kymograph does not eliminate these after-effects in some individuals.

During the first and second periods which last together for one

* See kymographic records, p. 59.
FIGURE 3.

Kymographic Record of the Test of Rhythmic Perseveration

(A "No Change" Patient)
...
minute S gets used to a definite rhythmical activity (hand-ear) coordination at definite intervals. When the metronome speed is suddenly increased S "perseverates" and continues his previous activity for a small fraction of a minute until he completely adjusts himself to the new rhythm. The time utilized for the adjustment to the new rhythm and for the overcoming the tendency to preserve the old one is called the perseveration time. It is not measured in seconds, but in terms of the large waves traced from the moment of change on the kymograph which are shortly followed by the small waves which represent the new and faster rhythm.

D. Critique of Subjects' Reports [Reliability]

The report of psychotic subjects is not to be accepted naively, without any criticism. It must be stressed that E must make sure that S understands fully the instructions, but, this is not sufficient. It is necessary to focus S's attention upon the task (i.e., report et cetera) at hand. To some extent a tension and feeling of "need" to report must be created in the subject. In most cases it is fairly easy for E, after some experience, to identify the report, upon which the subject concentrated well. In the case of "adaptation to light" and "electrical sensitivity" a number of readings must be obtained, from which the reliability of the report can be deduced. When E felt that the value of the results of some test was impaired by lack of sufficient concentration on the part of S or by his excessive suggestibility, the results of that particular test were not used in the final computations. Thus, much of the work had to be discarded and consequently, the number of cases reduced, in accordance with this procedure. No unfair sampling was introduced as a result of this
The target of genetic engineering is to use the potential of genetic modification to achieve a desired outcome. This approach involves altering the genetic material of an organism to make it perform a specific function or to resist certain conditions. The goal is to enhance or modify the organism's traits to improve its survival, productivity, or other characteristics.

The process of genetic modification typically involves the use of recombinant DNA technology, which allows scientists to introduce new genes into an organism's DNA. This can be done by inserting foreign DNA into the organism's cells, which are then allowed to express the new genes.

One common application of genetic engineering is in agriculture, where crops are modified to resist pests or tolerate drought conditions. This has the potential to increase crop yields and reduce the use of harmful chemicals.

However, genetic modification also raises ethical and environmental concerns. There are concerns about the long-term effects of genetic modification on the environment and the potential for unintended consequences. Additionally, there are concerns about the potential for genetically modified organisms to crossbreed with non-modified organisms, potentially creating new, unintended traits.

Despite these concerns, genetic engineering continues to be an active area of research and development, with the potential to provide significant benefits in various fields.
procedure, since there was no predominance of one diagnosis or another in the eliminated group. Suggestion played an important part in the experiment on electrical sensitivity when the subject felt a "tingle" even before the current was turned on. E. purposely asked for reports when there was no current passing in order to check the value of S's responses. A similar situation prevailed in the adaptation test, though it was more difficult to check the reliability of the reports.

In the other tests no such difficulties were noticed, since the results are dependent upon one's behavior and performance rather than "introspective" reports. No doubt, however, that even here, fluctuations in attention and in volition played an important and, at times, a vitiating role.

E. Methods of Scoring

The motor tests were scored, previously, in a number of different ways. The following are the different activities involved in each of the motor tests:

- **X₁** - Habituated activity for 30 seconds (regular "Z's" (a) three short strokes and a long one).
- **Y** - Different but similar activity for 60 seconds (reversed Z's and two short strokes and a long one).
- **Z** - Alternation of habituated and different units for 30 seconds.
- **X₂** - Repetition of **X₁**. Each activity in the first motor-test (2) has its parallel in the second motor test (grouped strokes).

Previous methods of scoring as reviewed by some investigators

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*The letters X, Y, Z refer to the amount of output in each period.*
possessed many masking factors. For instance, a scoring equivalent to
\[ X + Y - 2Z \] will give too much weight, in the "p" score, to the speed in the
performance of the subject. Also, \[ \frac{2X}{YZ} \] gives undue weight to the "different
but similar activity" in which the difficulty is more of learning the new
mode of response, rather than in the interference of perseveration.

The rationale of the present scoring follows a different path. The
\( X_1 \) activity is considered as a "warming up" activity, not be counted in
calculating the final score. Then, in \( Z \)-activity (alternation), if there
were no perseveration at all, the number of letters written would be equal
to half the number written in \( X_2 \) plus one fourth the number written in \( Y \)
(since there a 60 second period is allowed). In other words, there being
no perseveration \[ Z = \frac{X}{2} + \frac{Y}{4} \] or \[ 2Z = X + \frac{Y}{2} \].

However, \( Z \) is usually smaller on account of "p" in the alternating activity;
then, the number of units lost due to perseveration will equal to
\[ X + \frac{Y}{2} - 2Z \] or \[ 2X + Y - 4Z \].

However, this alone will give us a quantity, not related to the speed of
the individual will be the adequate "p" score. Hence we have
\[ \frac{X + \frac{Y}{2} - 2Z}{X + \frac{Y}{2}} \] (100) as the "p" score; i.e., the ratio between the units
(letters or groups of strokes) lost due to "interference." This method of
scoring was employed in the preliminary results present in the present study.

It is noteworthy that when this method is used, negative scores \(^7\) (due to a
larger \( 2Z \) value than \( X + \frac{Y}{2} \)) are obtained. Such scoring is undesirable for
a number of statistical and theoretical reasons.

A different method of scoring was applied to the results of the

\(^7\) See Chapter VI, present study.
final study. In order to deal largely with positive scores and provide for
simpler calculations, an output ratio is set up in which the habitual
regular output is put over the alternating activity which is to reveal
perseveration. The ratio is as follows: \( \frac{X + Y}{2Z} \). If the person is a great
perseverator he will have many fewer units in his "Z" output than in either
"X" or "Y"; thus, the ratio will be larger; consequently, the "p" score
will also be larger. This ratio is multiplied by 100 in order to avoid
dealing with fractions in the frequency distribution and in the conclusions.

Scoring the adaptation test was quite simple—the mean of the
last two measures of time necessary to see the "round spot" was used as the
final score. The assumption here is, as it has been in previous experiments,
that the longer the after-function or after-sensitivity, the greater is the
"Sekundafunktion" (secondary function) or perseveration.

The strength of current necessary to "just feel a tingle" was taken
also as a measure of the subject's perseveration. Here too, the average
of the last two readings was taken as the final score. The basic idea
behind this is that inertia is a property of states of rest as well as
of motion; the higher perseverator would have a higher threshold for any
sensitivity. His inertia (i.e., perseveration) is that of maintaining a
state of rest despite disturbances. However, when stimulation is strong
enough, this "inertia" is overcome, the subject then "feels" the stimulation.
The point at which the liminal stimulation begins is a measure of persev-
eration, since up to that point the inertia or perseveration of rest is
maintained.

in the case of "rhythmic perseveration," the time that lapses until

--- See Chapter II, present study.
In order to keep things with positive answers, any negative for
important statements, no correct lines are in which the patient
state occurs in any case. The attention activity points to wear
The bearing is a main
The ratio in question is 
The problem is a main
ear's test will be measured immediately for "d" and "e"
In any case, some procedures will be tested
A fine test is spiral by the 100 in order to reach
sensitivity with treatment in the laboratory (administration of live culture of
Sensitivity the expression can make different types of the way of the
It is the measure of the procedure to see the "yellow dog" may need as the
In this case, the expression of-re is as it and been in the reverse interpretation
For the longer this interpretation or misinterpretation, the greater is the
Sensitivity (sensory function) to preservation
The expression of certain necessary to "make feel a little" can happen
as a measure of the procedure's preservation. Here too, the
The fact that new locations can taken as the first course. This point
A thing if to feel interest in the first time. It's been kind of a major
factor: the bigger preservation would make a direct interpretation for any
expressions. The important (e.g., preservation) in part of maintaining a

In this case of "information preservation", the same file placed with
See chapter II, previous work.
adjustment to the new rhythm of the metronome takes place is considered as a measure of perseveration. However, that time cannot be measured in any other manner except in terms of distance traversed on the smoked drum of the kymograph. Every pressure exerted by S on the tube, records a long wave on the kymograph drum. The waves of the first 30 seconds are somewhat larger (slower metronome) than the ones in the following 15 seconds (faster metronome). The smaller waves appear shortly after the speed has been changed. A few large waves still persist. Hence E measures by means of dividers the length of the first five waves (apt to include the few persisting from the previous rhythm) and then, the length of the last five waves in the 15 second period. The ratio between the former (supposed to be larger) and the latter gives an index of perseveration.

The final score is calculated in the following manner:

\[ \frac{L_1}{L_2} \times 100 = P. \]

$L_1$ is the length of the first five waves immediately after the change of speed of the metronome; $L_2$ is the length of the last five waves of that fast metronome 15 second period---$P$ is the final score.
The final score of a test is determined by the following formula:

\[ X = \frac{\text{score}}{100} \times 5 \]

This formula calculates the percentage of the total possible score. If a student's score is 85, the percentage would be:

\[ \frac{85}{100} \times 5 = 4.25 \]

The student's score is 4.25 out of the maximum of 5 points.
1. Preliminary Results

The aim of the study was much more circumscribed during the preliminary period of experimentation. I was interested in determining the difference between the two groups and the intercorrelation of the tests employed. The picture presented itself in a manner somewhat different than it appeared in other investigations. The table below gives us the mean of the scores of four tests* for the two diagnostic groups.

CHAPTER V

| TABLE VI |

EXPERIMENTAL RESULTS

Some E-Gains in Cases of Demonic-tragic and Manic-Depressive

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>E-Test</th>
<th>Barreda</th>
<th>MMPI-Serial</th>
<th>Adapt.</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Demonic-tragic</td>
<td>33.1</td>
<td>-2.0</td>
<td>80.9</td>
<td>45.0</td>
<td>62.4</td>
</tr>
<tr>
<td>Manic-depressive</td>
<td>34.3</td>
<td>12.0</td>
<td>72.0</td>
<td>20.0</td>
<td>23.1</td>
</tr>
<tr>
<td>( r_{2,p} )</td>
<td>.27</td>
<td>.41.3</td>
<td>.59</td>
<td>.78</td>
<td>.85</td>
</tr>
<tr>
<td>Chance in 100</td>
<td>.07</td>
<td>.04</td>
<td>.18</td>
<td>.20</td>
<td>.20</td>
</tr>
</tbody>
</table>

There appears to be a definite trend, on the basis of these data, towards higher perseveration among the depressives and lower among the manic-depressives, of course, in some of the E-test and the adaptation tests, the differences appear very small and insubstantial. However, in the other tests they are of considerable magnitude, grouped together, of course. Another interesting fact was simultaneously revealed, the mean age of the

*Also the "in" test was used; too little data prevented its inclusion.
A. Preliminary Results

The aim of the study was much more circumscribed during the preliminary period of experimentation. E was interested in determining the difference between the two groups and the intercorrelation of the tests employed. The picture presented itself in a manner somewhat different than it appeared in other investigations. The table below gives us the means of the scores of four tests* for the two diagnostic groups.

TABLE VI

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Z-test</th>
<th>Strokes</th>
<th>Elect. Sensit.</th>
<th>Adapt.</th>
<th>Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dementia Praecox</td>
<td>23.1</td>
<td>-2.0</td>
<td>56.9</td>
<td>15.0</td>
<td>42.4</td>
</tr>
<tr>
<td>Manic Depressive</td>
<td>24.2</td>
<td>13.1</td>
<td>63.0</td>
<td>20.2</td>
<td>33.1</td>
</tr>
<tr>
<td>( \frac{D}{FE_D} )</td>
<td>0.27</td>
<td>31.9</td>
<td>2.50</td>
<td>1.24</td>
<td></td>
</tr>
<tr>
<td>Chances in 100</td>
<td>57</td>
<td>98</td>
<td>95</td>
<td>80</td>
<td></td>
</tr>
</tbody>
</table>

There appears to be a definite trend, on the basis of these data, towards higher perseveration among the depressives and lower among the praecoxes. Of course, in case of the Z-test and the adaptation test, the differences appear very small and insignificant. However, in the other tests they are of considerable magnitude (grouped strokes, stimulation). Another interesting fact was simultaneously revealed; the mean age of the

*Also the "it" test was used; too little data prevented its inclusion.
### IV. TABLE

<table>
<thead>
<tr>
<th>Test</th>
<th>Value</th>
<th>T-value</th>
<th>P-value</th>
<th>F-value</th>
<th>S-Estimate</th>
<th>R-square</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.5</td>
<td>0.61</td>
<td>0.06</td>
<td>0.5</td>
<td>1.68</td>
<td>p-value</td>
<td></td>
</tr>
<tr>
<td>1.0</td>
<td>0.32</td>
<td>0.5</td>
<td>1.78</td>
<td>0.15</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.0</td>
<td>0.45</td>
<td>0.15</td>
<td>8.12</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.0</td>
<td>0.60</td>
<td>0.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0</td>
<td>0.40</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.01</td>
</tr>
</tbody>
</table>

### Notes

- **Test**: The significance level for each test.
- **Value**: The calculated value for the test.
- **T-value**: The t-value for the test.
- **P-value**: The p-value for the test.
- **F-value**: The F-value for the test.
- **S-Estimate**: The S-Estimate for the test.
- **R-square**: The R-square value for the test.

Note: The table above is a snapshot of the data used in the analysis.
of the praecox group was nine years higher than that of the manic-depressive group. The question arose, therefore, whether the differences between the means of the two groups are actually due to the differential diagnosis or to a possible correlation, negative or positive, between the tests and the age of the subjects. All the tests were, therefore, correlated with age. The rank-difference method was used in all correlations of the preliminary results.

The table below shows us the correlations of each test with age. Among these coefficients of correlation, the first one (adaptation) is the only significant one; its probable error being .099, less than one fourth its own magnitude.

**TABLE VII**

Preliminary Correlations of Tests with Age.

<table>
<thead>
<tr>
<th>Light Adaptation</th>
<th>Electrical Stimulation</th>
<th>Z-Test</th>
<th>Strokes</th>
</tr>
</thead>
<tbody>
<tr>
<td>.43</td>
<td>.27</td>
<td>-.26</td>
<td>-.31</td>
</tr>
</tbody>
</table>

The other coefficients of correlation are much less than four times their probably errors. Hence, the only significant correlation is a positive one, and if anything, it would reduce still more the adaptation score in the case of the dementia praecox group, taking age into account, and thus, accordingly increase the difference between the latter group and that of manic-depressive.

The intercorrelation of the tests presented a case for the separation of the motor from the sensory tests. The correlation between the two motor
<table>
<thead>
<tr>
<th>Percentage of Total</th>
<th>Expected</th>
<th>Experimental</th>
<th>Actual</th>
<th>Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>1%</td>
<td>2%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2%</td>
<td>3%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
tests (Z and grouped stroke) was a rather significant one; it was a positive correlation of .51 with a P. E. of .095. Thus it appears that there definitely is a linkage between the two tests measuring a like factor.

The correlation between the adaptation test and that of electrical liminal sensitivity was positive, but rather low (.27) and not quite four times its P. E. One may thus presume a weak factor of sensory perseveration.

A more important discovery, however, was the negligible relationship between the motor and sensory tests. For instance, the positive coefficient of correlation between the Z-test and that of adaptation was .01. It was, therefore, necessary to conclude, tentatively, on the basis of these results, that the sensory tests used may not measure perseveration at all. They may measure the reaction-time of the subjects or their ability to follow instructions, rather than the perseverative tendency. Or, if there are such things as motor and sensory perseveration, some relationship between them ought to be shown in order to permit the common term.

The following problems suggested themselves for further investigation with a larger number of subjects:

1. Is there a difference in perseveration between like age groups of different psychiatric diagnosis?

2. Do we still discern two distinct factors, i.e., motor and sensory perseveration?

3. What age level is responsible for the correlation with age (if present)?

The results in the next section are attempts to solve these problems.
The following paragraph suggests a sequence for further investigation:

1. Prepare a literature review on environmental impacts.
2. Conduct a detailed analysis of the ecosystem affected.
3. Develop a plan for restoration and conservation efforts.
4. Present findings to stakeholders for implementation.

The overall goal is to maintain ecological balance and ensure sustainable practices.
B. Further Results

The tables (VIII, IX, X, XI, on pages 69, 70, 71, 72) are compiled on the basis of the results obtained from the second experimental group (B).

Table VIII shows, as far as age is concerned, the reverse condition from what is obtained in Table VI. Here the mean age of the manic-depressives is higher than that of the dementia praecox cases. The other conditions, however, remain approximately the same, that is, the scores of the dementia praecox patients in all tests are lower than those of the manic-depressives. A truly significant difference exists, perhaps, in the case of the Z-test (91 chances in 100); the reliability of the other differences, though pointing in one direction, is not great enough to serve as a basis for certainty and conclusiveness. Of course, in both cases (of preliminary and present results) only the depressive-phase patients were used in the comparison.

Tables IX, X, and XI give us the further opportunity to analyze the scores within the general praecox group; groups of patients of the same number, whose mean age was approximately the same, were matched. There, the catatonic group, seems to be definitely higher in three of the tests, than either group of paranoid praecoxes and the "others" (hebephrenics and simple) group. This was further substantiated (though not perfectly) after the significant ratios had been computed. The differences between the means of the catatonic group and each of the others is of considerable significance, at least in two tests (Strokes and adaptation). Obviously, the differences between the paranoid and "others" group is of no significance. The dementia praecox paranoid group seems to be lowest in the general praecox group in regard to the adaptation and electrical sensitivity tests. Otherwise, there is little difference between the two groups (paranoid and others).
Table IV, then, is not as simple as it may appear to be at first glance.

The table shows the distribution of the different types of materials used in the experiment. As can be seen, a large portion of the materials were classified as "unknown" or "other." This suggests that there may be a need for further research to determine the exact nature of these materials.

Furthermore, the table indicates that the materials were used in varying quantities. Some materials were used in very small amounts, while others were used in much larger quantities.

In conclusion, the data presented in Table IV highlights the importance of understanding the materials used in the experiment. Further research is needed to determine the exact nature of these materials and their effects on the experiment.
### TABLE VIII

**MEANS OF P SCORES FOR DEMENTIA PRAECOX AND MANIC-DEPRESSIVE CASES**

<table>
<thead>
<tr>
<th></th>
<th>Dementia Praecox</th>
<th>Manic Depressives</th>
<th>$D_{PE_D}$</th>
<th>CHANCES IN 100*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>35.2</td>
<td>40.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-Test</td>
<td>116.5</td>
<td>130.5</td>
<td>2.00</td>
<td>91</td>
</tr>
<tr>
<td>Strokes</td>
<td>110.8</td>
<td>114.7</td>
<td>0.66</td>
<td>72</td>
</tr>
<tr>
<td>Adaptation</td>
<td>44.9</td>
<td>51.4</td>
<td>1.16</td>
<td>78</td>
</tr>
<tr>
<td>Electrical Stimulation</td>
<td>61.6</td>
<td>64.7</td>
<td>1.02</td>
<td>75</td>
</tr>
</tbody>
</table>

*Number of chances in 100 that the obtained difference is significant (that a true difference exists).*
<table>
<thead>
<tr>
<th>CHANGE IN %</th>
<th>$D$-I/P</th>
<th>% DECREASE</th>
<th>DECREASE</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>2.04</td>
<td>3.80</td>
<td>5.86</td>
</tr>
<tr>
<td>0.5</td>
<td>0.93</td>
<td>1.81</td>
<td>3.62</td>
</tr>
<tr>
<td>0.5</td>
<td>0.23</td>
<td>0.46</td>
<td>0.92</td>
</tr>
<tr>
<td>0.5</td>
<td>0.11</td>
<td>0.20</td>
<td>0.36</td>
</tr>
<tr>
<td>0.5</td>
<td>0.01</td>
<td>0.02</td>
<td>0.04</td>
</tr>
</tbody>
</table>

Note: The values in the table are in percent of 100 from the original value.
### TABLE IX

F-Scores of Catatonics and other Praeox Cases

<table>
<thead>
<tr>
<th></th>
<th>Catatonics</th>
<th>Others</th>
<th>D/FED</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>35.7</td>
<td>36.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-Test</td>
<td>124.7</td>
<td>112.3</td>
<td>1.69</td>
<td>90</td>
</tr>
<tr>
<td>Stroke</td>
<td>129.7</td>
<td>111</td>
<td>2.33</td>
<td>97</td>
</tr>
<tr>
<td>Adaptation</td>
<td>60.6</td>
<td>36.6</td>
<td>3.56</td>
<td>99</td>
</tr>
<tr>
<td>El. St.</td>
<td>66.3</td>
<td>60.3</td>
<td>1.60</td>
<td>66</td>
</tr>
<tr>
<td>% Cap.</td>
<td>0 - 50%</td>
<td>50 - 100%</td>
<td>Observation</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>---------</td>
<td>-----------</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>25</td>
<td>0.05</td>
<td>0.01</td>
<td>1.10</td>
<td></td>
</tr>
<tr>
<td>35</td>
<td>0.01</td>
<td>0.02</td>
<td>0.59</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>0.03</td>
<td>0.05</td>
<td>0.02</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>0.01</td>
<td>0.00</td>
<td>0.30</td>
<td></td>
</tr>
</tbody>
</table>
TABLE X

P-Scores of Catatonics and Paranoiacs

<table>
<thead>
<tr>
<th></th>
<th>Catatonics</th>
<th>Paranoiacs</th>
<th>( \frac{D}{\text{PED}} )</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>35.7</td>
<td>35.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-Test</td>
<td>124.7</td>
<td>117.7</td>
<td>1.10</td>
<td>77</td>
</tr>
<tr>
<td>Stroke</td>
<td>129.7</td>
<td>110.7</td>
<td>3.16</td>
<td>96</td>
</tr>
<tr>
<td>Adaptation</td>
<td>60.6</td>
<td>31.1</td>
<td>4.35</td>
<td>100</td>
</tr>
<tr>
<td>El.St.</td>
<td>66.0</td>
<td>60.3</td>
<td>1.52</td>
<td>84</td>
</tr>
</tbody>
</table>
Table

Results of Osmotic and Perspiration

<table>
<thead>
<tr>
<th>Compound</th>
<th>( \frac{n}{100} )</th>
<th>Osmication</th>
<th>Perspiration</th>
<th>Osmication</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>0.12</td>
<td>7.12</td>
<td>9.25</td>
<td>10.31</td>
</tr>
<tr>
<td>86</td>
<td>0.12</td>
<td>7.21</td>
<td>9.32</td>
<td>10.41</td>
</tr>
<tr>
<td>60</td>
<td>0.18</td>
<td>7.09</td>
<td>9.31</td>
<td>10.39</td>
</tr>
<tr>
<td>30</td>
<td>0.44</td>
<td>4.16</td>
<td>9.00</td>
<td>9.99</td>
</tr>
<tr>
<td>80</td>
<td>0.10</td>
<td>2.00</td>
<td>0.30</td>
<td>0.30</td>
</tr>
</tbody>
</table>

Total Sum
In Table XI on page 76, the scores are compared with the depressives, there are no significant differences in the normal of the scores test and that of attentional selectivity, but the differences on the other tests are of considerable magnitude and the chances are 99 in 100 that a true difference exists.

The next table (2NN) on page 76, gives a complete picture of the intercorrelations between the tests and age.

<table>
<thead>
<tr>
<th></th>
<th>Paranoics</th>
<th>Others</th>
<th>$D_{PE}$</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>35.7</td>
<td>36.1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-Test</td>
<td>117.7</td>
<td>112.5</td>
<td>1.33</td>
<td>62</td>
</tr>
<tr>
<td>Strokes</td>
<td>110.7</td>
<td>111</td>
<td>.06</td>
<td>52</td>
</tr>
<tr>
<td>Adaptation</td>
<td>31.1</td>
<td>36.6</td>
<td>1.55</td>
<td>65</td>
</tr>
<tr>
<td>El. St.</td>
<td>60.3</td>
<td>60.3</td>
<td></td>
<td>50</td>
</tr>
</tbody>
</table>
## Table

<table>
<thead>
<tr>
<th>Glasses</th>
<th>$n$</th>
<th>$\frac{n}{n^2+1}$</th>
<th>Refractive</th>
<th>Diameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1.05</td>
<td>7.02</td>
<td></td>
<td>60</td>
</tr>
<tr>
<td>55</td>
<td>0.91</td>
<td>6.71</td>
<td>7.911</td>
<td>65</td>
</tr>
<tr>
<td>60</td>
<td>0.87</td>
<td>6.11</td>
<td>7.311</td>
<td>70</td>
</tr>
<tr>
<td>65</td>
<td>0.83</td>
<td>6.11</td>
<td>7.911</td>
<td>75</td>
</tr>
<tr>
<td>70</td>
<td>0.85</td>
<td>6.05</td>
<td>6.68</td>
<td>80</td>
</tr>
</tbody>
</table>
In Table XII on page 74, the manics are compared with the depressives, there are no significant differences in the scores of the Stroke-test and that of electrical sensitivity, but the differences on the other two tests are of considerable magnitude and the chances are 99 in 100 that a true difference exists.

The next table (XIII), on page 75, gives a complete picture of the intercorrelations* of the various tests with each other and with age. Except for the test of electrical sensitivity (in this case the correlation is significant), age plays a small role in modifying the "p" score of individuals. There is a slight correlation with age between each of the tests. The next two highest positive correlations are between the two sensory and between the two motor tests respectively. One of the motor tests correlates very slightly, positively with each of the sensory ones, but the other motor tests (strokes) shows a negative coefficient of correlation in both cases.

The results in Tables XIV, XV, on page 76 are rather unexpected. It appears that the scores of the three better intercorrelated tests are much lower for the lowest age group (20-29). The scores then go up and stay up between 30-49 and then are reduced again, at the highest age level (50-59). The differences between the 20-29 and 30-39 groups are quite reliable and significant, showing a definite trend upward, beyond the 30 year level. The reduction of the scores at the highest age-level (50-59) is less marked and not quite so significant.

The table below, (XVI) gives the mean results obtained for a group of partly recovered patients. The improvement was determined by the subject's

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*The Product-moment method of correlation was used.
In order to use a reference to the World Wide Web, some differences in the form of the text and page layout may be present. These differences may include changes in font size, line spacing, and paragraph alignment. It is important to ensure that the referenced content is accurately represented in the document. In this case, the document contains information about the use of the World Wide Web for research and information sharing.

To access "III" pages in the same or different sources (e.g., articles, books, or websites), it is necessary to have access to the Internet. This access can be obtained through various means, such as personal computers, smartphones, or other devices with Internet capabilities. Once access is obtained, the user can search for specific information using search engines or other tools available online.

The information provided in this document is not intended to be a comprehensive guide to the World Wide Web. Instead, it is a brief overview of some of the key features and applications of the Internet. It is important to consult additional resources for more detailed information on this topic.
A COMPARISON BETWEEN MANIA AND DEPRESSION IN REGARD TO PERSEVERATION

<table>
<thead>
<tr>
<th></th>
<th>Manics</th>
<th>Cases of Depression</th>
<th>$\frac{D}{PE_D}$</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>34.5</td>
<td>35.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Z-Test</td>
<td>119.3</td>
<td>152.3</td>
<td>3.55</td>
<td>99</td>
</tr>
<tr>
<td>Stroke</td>
<td>109</td>
<td>107.6</td>
<td>.29</td>
<td>58</td>
</tr>
<tr>
<td>Adaptation</td>
<td>39.3</td>
<td>64.9</td>
<td>3.46</td>
<td>99</td>
</tr>
<tr>
<td>Electrical Stimulation</td>
<td>65.1</td>
<td>56.8</td>
<td>1.26</td>
<td>60</td>
</tr>
</tbody>
</table>
II. WHAT

A COMPARISON BETWEEN WINTER AND DECEMBER IN REGARD TO FREQUENCIES

<table>
<thead>
<tr>
<th>Exercise to 100</th>
<th>P</th>
<th>Score at</th>
<th>Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>65%</td>
<td>5.05</td>
<td>6.11</td>
</tr>
<tr>
<td>50</td>
<td>60%</td>
<td>3.70</td>
<td>5.01</td>
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<tr>
<td>40</td>
<td>55%</td>
<td>3.00</td>
<td>4.72</td>
</tr>
<tr>
<td>30</td>
<td>50%</td>
<td>2.00</td>
<td>4.00</td>
</tr>
</tbody>
</table>

Note: The table continues with similar entries for different percentages and scores.
### TABLE XIII

**Correlations Between the Tests**

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>Adapt. to Light</th>
<th>Elect. Sensit.</th>
<th>Z-test</th>
<th>Stroke Test</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td>.122</td>
<td>.348</td>
<td>.264</td>
<td>.113</td>
</tr>
<tr>
<td></td>
<td></td>
<td>±.062</td>
<td>±.073</td>
<td>±.063</td>
<td></td>
</tr>
<tr>
<td><strong>Adaptation to Light</strong></td>
<td>.122</td>
<td>.438</td>
<td>.165</td>
<td></td>
<td>-.201</td>
</tr>
<tr>
<td></td>
<td></td>
<td>±.062</td>
<td>±.071</td>
<td>±.069</td>
<td></td>
</tr>
<tr>
<td><strong>Electrical Sensitivity</strong></td>
<td>.356</td>
<td>.438</td>
<td>.096</td>
<td>-.209</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±.079</td>
<td>-.071</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Z-test</strong></td>
<td>.264</td>
<td>.165</td>
<td>.096</td>
<td>.306</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±.063</td>
<td>±.090</td>
<td>±.085</td>
<td></td>
</tr>
<tr>
<td><strong>Stroke-test</strong></td>
<td>.113</td>
<td>-.201</td>
<td>-.209</td>
<td>.306</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>±.085</td>
<td>±.085</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Item</td>
<td>Description</td>
<td>Amount</td>
<td>Other Info</td>
<td></td>
<td></td>
</tr>
<tr>
<td>------</td>
<td>-------------</td>
<td>--------</td>
<td>------------</td>
<td></td>
<td></td>
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<tr>
<td>1000</td>
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<td>900</td>
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<td>200</td>
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<td></td>
</tr>
<tr>
<td>100</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### TABLE XIV
TEST SCORES FOR YOUNGER AGE-GROUPS

<table>
<thead>
<tr>
<th></th>
<th>20-29</th>
<th>30-39</th>
<th>( \frac{D}{PED} )</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-Test</td>
<td>115.4</td>
<td>127.9</td>
<td>3.90</td>
<td>100</td>
</tr>
<tr>
<td>Grouped Strokes</td>
<td>115.4</td>
<td>102.2</td>
<td>2.94</td>
<td>97</td>
</tr>
<tr>
<td>Adaptation</td>
<td>34.0</td>
<td>48.2</td>
<td>3.71</td>
<td>99</td>
</tr>
<tr>
<td>El. Stim.</td>
<td>52.9</td>
<td>63.2</td>
<td>2.69</td>
<td>97</td>
</tr>
</tbody>
</table>

### TABLE XV
TEST SCORES FOR OLDER AGE-GROUPS

<table>
<thead>
<tr>
<th></th>
<th>40-49</th>
<th>50-59</th>
<th>( \frac{D}{PED} )</th>
<th>Chances in 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-Test</td>
<td>131.1</td>
<td>118</td>
<td>2.27</td>
<td>94</td>
</tr>
<tr>
<td>Grouped Strokes</td>
<td>123.0</td>
<td>110</td>
<td>2.37</td>
<td>95</td>
</tr>
<tr>
<td>Adaptation</td>
<td>49.4</td>
<td>39.6</td>
<td>2.73</td>
<td>97</td>
</tr>
<tr>
<td>El. Stim.</td>
<td>64.0</td>
<td>63.7</td>
<td>0.09</td>
<td>52</td>
</tr>
</tbody>
</table>
### VLF DATA

**EKEN-36, Propagation Measurements**

<table>
<thead>
<tr>
<th>Frequency in MHz</th>
<th>d/Q0</th>
<th>95-00</th>
<th>85-95</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>0.1</td>
<td>1.701</td>
<td>3.611</td>
</tr>
<tr>
<td>2.0</td>
<td>0.8</td>
<td>1.701</td>
<td>3.611</td>
</tr>
<tr>
<td>3.0</td>
<td>1.5</td>
<td>1.701</td>
<td>3.611</td>
</tr>
<tr>
<td>4.0</td>
<td>0.2</td>
<td>1.701</td>
<td>3.611</td>
</tr>
</tbody>
</table>

### VLF Лицет

**EKEN-36, TWO FOR CONCLUSION**

<table>
<thead>
<tr>
<th>Frequency in MHz</th>
<th>d/Q0</th>
<th>95-00</th>
<th>85-95</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>0.1</td>
<td>1.701</td>
<td>3.611</td>
</tr>
<tr>
<td>2.0</td>
<td>0.8</td>
<td>1.701</td>
<td>3.611</td>
</tr>
<tr>
<td>3.0</td>
<td>1.5</td>
<td>1.701</td>
<td>3.611</td>
</tr>
<tr>
<td>4.0</td>
<td>0.2</td>
<td>1.701</td>
<td>3.611</td>
</tr>
</tbody>
</table>
### Table XVI

<table>
<thead>
<tr>
<th>P-Scores of Improved Subjects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-Test</td>
</tr>
<tr>
<td>--------</td>
</tr>
<tr>
<td>120</td>
</tr>
</tbody>
</table>

accessibility as determined by E in cooperation with the attending physician. Some of this group were on parole which is the status nearest to dismissal from the institution.

The only test that shows any definite difference is that of adaptation time. The improved patients present in this one test a much smaller score. In the rest of the tests no great change in "p" is evident when compared with the mean of the entire experimental group.

### C. The Test on Rhythmic Perseveration

The subjects were divided into two groups after the results were obtained. Some of the subjects demonstrated no change in their speed of movement (pressing the tube) after the speed of the metronome was altered. The other group showed definite changes in the rhythm shortly after the metronome beats came more rapidly. The individual differences within this latter group are not sufficiently marked nor can they be adequately graded in order to be correlated with the other tests. However, there are some differences between the magnitude of the scores of the subjects who demonstrate no change in rhythm and those who do show the change. In Table XVII (below) we see that in three of the other tests (except adaptation)
TABLE XI

<table>
<thead>
<tr>
<th>E-Lactate Elevation</th>
<th>Response</th>
<th>8-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>3.8</td>
<td>110</td>
</tr>
</tbody>
</table>

The only test that shows any definite elevation is that of E-Lactate elevation. The importance of E-Lactate elevation in this case is much greater. In the case of the lactate, no great changes in the values were noted. The case of the E-Lactate elevation shows some interesting possibilities that need further study.

**The Test on Lipid Peroxidation**

The samples were taken into two groups after the lactate test. Some of the samples were exposed to oxygen in the air, while others were kept in a closed system. The results obtained showed that the samples exposed to oxygen contained more hydroperoxides than the samples kept in a closed system. This indicates that the samples exposed to oxygen have undergone some form of lipid peroxidation.

In conclusion, we see that the effects of the lactate test (E-Lactate Elevation)
TABLE XVII

P-Scores for High and Low Perseverators as Determined by the Test on Rhythmic Perseveration.

<table>
<thead>
<tr>
<th></th>
<th>No Change</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>128</td>
<td>114</td>
</tr>
</tbody>
</table>

The mean scores for the "no change" group are higher than for the "change" group.

Much more should be expected from this method with an electrical set-up of more exact recording devices.
CHAPTER VI

DISCUSSION OF RESULTS

Our results seem to agree in part with the results presented by Davenport. In his results Davenport establishes the fact that senile are lowest perseverators, while next to them, somewhat higher, are cases of dementia praecox (see Table I). Next, while higher perseverators are the manio-depressive, while the regular perseverators are, according to him, a mixture of manio-depressives and "y". Our results appear to confirm the fact that the senile are lowest perseverators (with the ascension of the test of electrical reactivity). Next, it appears that the manio-depressive group as a whole is higher than in every test, both in the preliminary as well as in the final readings. The mean age of the manio-depressive's being higher in the preliminary readings and lower in the final ones. This is also given a different picture from that obtained by Shipler which places the manic-depressive group highest in regard to perseveration. The answer to the obvious inconsistency may be found in the following explanations:

1. The methods were quite different in Shipler's and Davenport's work. The former used entirely different tests (psychological traits, conditionability, suspension, and others). The latter's manner of obtaining the scores on the basis of a 50 point scale may have changed the true picture for some elements. An analysis of the significance of the difference between the scores made by either investigator.

2. No differentiations have been made within the manic-depressive group. There may be types of individuals in this group who may have the scores up for the rest of the group.

See Table XII, page 37.
See Table XIV, page 46.
CHAPTER IV

PAPER TO PAPER
A. **Diagnoses and P-Scores**

Our results seem to agree in part with the tables presented by 1 Stephenson. In his results Stephenson establishes the fact that manics are lowest perseverators, while next to them, somewhat higher, are some cases of dementia praecox (low "p"), then still higher perseverators are the manic-depressives, while the highest perseverators are, according to him, a number of praecox cases (high "p"). Our results appear to confirm the fact that the manics are lowest perseverators (with the exception of the test on electrical sensitivity). Next it appears that the manic-depressive group as a whole is consistently higher in every test, both in the preliminary as well as in the final results; the mean age of the manic-depressive's being higher in the preliminary results and lower in the final ones. This is also quite a different picture from that obtained by Shipley 2 who places the schizophrenic group highest in regard to perseveration. The answer to the obvious inconsistency must be found in the following explanations:

1. The methods were quite different in Shipley's and in Stephenson's work. The former used entirely different tests (psychogalvanic reflex, conditionability, extinction, and others). The latter's manner of combining the scores on the basis of a 20 point scale may have changed the true picture to some extent. No measures of the significance of the difference between the means were computed by either investigator.

2. No differentiations have been made within the dementia praecox group. There may be types of individuals in this group who may bring the score up for the rest of the group.

---

1 See Table III, page 37.
2 See Table IV, page 40.
When we sought to try and distinguish the praecox cases on the basis of the degree of dementia we found that too subjective criteria will have to be used. Hence the more "objective" groupings used in psychiatry were employed. The results show (again, with the exception of electrical stimulation) that within the praecox group, the catatonics show a markedly higher degree of perseveration than do the other two praecox groups. We tried to eliminate the age factor in this comparison in order to make it much more correct. These results, then, may explain Stephenson's "high-p" cases and "low-p" cases. The former may correspond to our catatonic group, while the latter may be characteristic of the paranoid, hebephrenic and simple types of dementia praecox.

Parenthetically, it should be remarked that even the catatonic group does not exceed in all tests the mean score of the depressive-phase psychotics. The results concerning the catatonics seem to be in agreement with those obtained by Mays in his studies.

Therefore, if we were to average up the scores we would be able to show the following sequence in order of increasing perseveration.

1. Manic
2. Dementia praecox paranoids
3. Hebephrenic and simple praecox patients
4. Manic-depressives
5. Catatonics

---


The following conclusions are of great importance.

1. Merc.
2. Deserts become barren.
3. Health is greatly impaired.
4. Land-scarce.
5. Circumstances.
B. Intercorrelation between the Tests

It is no secret that no battery of perseveration tests is near to being standardized. These tests, which have been previously used by other investigators, do not appear to intercorrelate well for psychotic subjects. Some better results may be obtained with normal subjects whose greater stability and lesser variability may account for it. The lack of significant correlations between the tests in psychotic subjects does not cast any reflections upon the validity and reliability of the tests. The trouble may be found in the psychotic subject who vacillates and changes from moment to moment though preserving general tendencies like the manic "low" and the depressive "high" perseveration.

The results also make apparent a significant connection between the two sensory tests and a less significant one between the two motor tests and little or practically no connection between the two types of tests (sensory and motor). Perhaps Allport's objection in this connection is pertinent (regarding the sensory tests). "...they are too trivial to tap the developed volitional functions of personality." Though in view of the definition of perseveration (in the broad sense) it does not necessarily have to meet with Allport's qualifications. Perseveration is not necessarily part of the "volitional functions of personality." The tendency to continue an activity can be well understood without bringing in the possible facilitating or inhibiting effects of volition.

The above discussion of facts does not necessarily destroy the value

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5 See above; Chapter II.
7 G.W. Allport, Personality, A Psychological Interpretation, 1937.
of the results obtained and individual differences uncovered in the psychotic groups.

The test on "Rhythmic Perseveration" shows that the subjects who did not change their rhythm at all, are also higher perseverators on the other tests. However, on the basis of this dichotomous classification of perseverators and non-perseverators it is difficult to work out a correlational function. The greater tendency of correspondence with this dichotomy is on part of the motor tests while the results of the sensory tests are equivocal. It must be concluded that this measure of perseveration has great promise; it may best tap the true sources of the perseverative tendency after greater refinement is introduced in the recording apparatus.

C. Relation between Age and Perseveration

In our group comparisons we tried to eliminate the age factor since some of the tests correlate positively with age. The Adaptation experiment results and those of electrical sensitivity and the Z-test correlate positively and quite consistently (preliminary and final results) with age. Granted that some of the correlations are not very significant; (low correlation and high probable error) they indicate a definite tendency nevertheless. On the whole, our results are in agreement with those of Cattell\(^6\) obtained from normal subjects with motor tests only. There is a lower perseveration score in the early twenties than in later years. The low ratios of the differences between the means and the probable errors of those differences (less than 4) may detract from the absolute certainty,

The report on "Strategic Positioning" goes much further in the subject.

On the one hand, it is clear that some of the ideas and principles discussed so far have not been fully integrated into the overall strategic framework. This may pose difficulties for the future.

On the other hand, the report also emphasizes the necessity of continuous improvement and adaptation to the changing environment. This requires a strong commitment to innovation and continuous learning.

In conclusion, the report provides a comprehensive overview of the current strategic position and outlines the key challenges and opportunities for the future.

Reference:

[Insert reference details here]
that a true difference exists. With the exception of the stroke test the tendency for the "p" score to increase with age (until 50) is quite marked. However, we were unable to confirm and must disagree with his conclusion that there is "...a further rise in extreme old age." Of course, it also depends on the definition of "extreme old age." But on the contrary, our results show a slight decrease in the "p" scores when the subjects approach sixty. This objection, however, must be qualified and it must be understood that complications due to psychosis are a factor which cannot be overlooked in the comparison. But, for the sake of truth, it should be stated that the differences between the means in Cattell's work are rather small; also, no measures of significance are given, which robs the work of its conclusiveness.

Another explanatory observation must be made before closing this section. The "lower p" score in motor tests only may be also explained on the basis of a reduction in general speed and fluency with age. Since, to some extent, the "p-score" depends on the initial speed of performance, it is accordingly reduced at the older age.

D. "Improvement" and P-Scores

Stephenson's claims that scores on perseveration tests may serve as a "barometer" of the mental state of the patient, are somewhat exaggerated and unwarranted by the evidence. Our results do show a tendency toward lower "p" scores in the case of improved patients. The degree of improvement of the patients in our results is, however, determined on more objective

\[ \text{Ibid., 90.} \]
\[ \text{Stephenson, op.cit.} \]
bases. Also, Stephenson retested patients who improved and based his conclusions on the results obtained from them. This procedure is not quite valid, since the element of training is not taken into consideration. Darroch investigated this point and found that it may be a vitiating factor. Our comparisons are not based on retests. We did not administer the same tests to the same subjects during different stages of recovery. Our results are based on a comparison of scores of groups of subjects tested only once. These groups were differentiated, as stated above, on the basis of the degree of improvement. Hence our results seem to be more reliable.

E. Theoretical Considerations.

On the basis of our results, we cannot agree with most of the investigators who put dementia praecox as highest in regard to perseveration. As we pointed out, there was no sufficient differentiation between the groups within the general group in their investigations.

The results, however, which follow from the work of Stephenson and others, seem to possess theoretical implications which are in keeping with some traditional typological theories. It was mentioned earlier in this paper that Gross identified the low secondary function with the "broad and shallow" type of consciousness while a high secondary function was characteristic of the "deep and narrow" type of consciousness. Jung's Extroversion-introversion is parallel to Gross' types. Jung says that
"Introversion is distinguished by...intensive primary function and a correspondingly long secondary function," while "extroversion is characterized by...weak primary function, and a correspondingly short secondary function." Since dementia praecox is identified with extreme introversion, and manic-depression with extreme extroversion, the two psychotic groups should give, deducing from Jung, high and low perseveration scores, respectively. Our results, as stated above, do not "support this notion."

We are opposed to the broad classification, in regard to perseveration, of manic-depressives and dementia praecox. We find that in both classes there are groups of individuals who have either high or low perseveration. This is not due to any "supervening dementia," but to the peculiar state of the individual personality. Jung admits that "exceptions, however, are frequent even in one and the same individual."  

An introvert may be extroverted under favorable conditions, while an extrovert may turn inward in a hostile, unfriendly situation.

We cannot, then, always speak of the manic-depressive, extrovert constitution, neither can we speak of the dementia praecox, introvert constitution. It appears that the psychiatric condition itself, ultimately, perhaps, traced to psychological extremes of types, creates the new milieu for the individual and guides and changes the secondary function or perseverative tendency along with it.

Thus, the manic, whose milieu is "favorable", is extremely extroverted, while the depressive of, presumably, the same constitution, gets "introverted" as a result of his own unpleasant world. This can also similarly be traced in the dementia praecox cases, who also become extroverted, while

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15 Ibid., 356.
The document text is not legible due to the quality of the image. It appears to be a page of text, possibly discussing a technical or scientific topic, but the details are not discernible from the provided image.
the catatonics of that group are "true to their classification" as extreme introverts and perseverators.

More caution, then, will have to be exercised in our linking extraversion and introversion with high and low perseveration. The particular, though transient, state of the individual under the experimental conditions must be considered. The emotional tone is an important factor. And, perhaps, more conclusive evidence may substantiate Shevach's statement, that "the subjects must first be divided into those in whom perseveration is a functional unit and those in whom it is highly specific."

We must then, from our work with psychotics, conclude that extremes of extraversion and of introversion go with extremes of low and high secondary function. However, the secondary function is also changeable in correspondence with the changeability of the state of introversion and extroversion.

Returning to Shevach's statement quoted above, we may consider it as a reasonable explanation of the low intercorrelation between our perseveration tests. A number of our individuals may be perseverators "true and consistent," while in others, perseveration does not exist as a functional unit, but is "highly specific" in the various and sundry test-situations.

CHAPTER VII

CONCLUSIONS

In drawing our conclusions we must be cautious to distinguish between actual factual results obtained in experimental and theoretical studies. The nature of these two elements and the predictive of the line of demarcation between them, may be a very tempting urge. We shall, however, try to avoid those pitfalls and confine ourselves to the following conclusions warranted by the data.

1. Differences between the two general psychiatric categories of depressive groups and manic-depressive categories, with regard to perseveration as measured by our tests, exist, but are not sufficiently significant statistically. The tendency is in the direction of higher perseveration in the manic-depressive group and lower in the depressive group.

2. Differences in degree of perseveration also exist between the sub-groups, within each general psychiatric category:

3. The males tend to be lower perseverators than the females.

4. The cataatonics are the greatest perseverators in the depressive group, while the paranoids tend to be least in this group.

5. When all groups are compared together, the males tend to be the lowest perseverators, while the cataatonics possess the highest degree of perseveration.

6. Age differences do exist in perseveration and have introduced a factor of error in previous investigations. Patients in the third decade of life (20-29 group) have a considerably lower perseveration score than the individuals of an older age. There also seems to be a slight tendency for...
A. Conclusions

In drawing our conclusions we must be cautious to distinguish between actual factual results obtained in experimentation and theoretical superstructures. The mixture of these two elements and the eradication of the line of demarcation between them, may be a very tempting urge. We shall, however, try to avoid these pitfalls and confine ourselves to the following conclusions warranted by the experimental data:

1. Differences between the two general psychiatric categories of dementia praecox and manic-depressive psychoses, with regard to perseveration as measured by our tests, exist, but are not sufficiently significant statistically. The tendency is in the direction of higher perseveration in the manic-depressive group and lower in the dementia praecox group.

2. Differences in degree of perseveration also exist between the sub-groups, within each general psychiatric category:
   a. The manics tend to be lower perseverators than are the depressives.
   b. The catatonics are the greatest perseverators in the dementia praecox group, while the paranoids tend to be lowest in this group.
   c. When all groups are compared together, the manics tend to be the lowest perseverators, while the catatonics possess the highest degree of perseveration.

3. Age differences do exist in perseveration and have introduced a factor of error in previous investigations. Patients in the third decade of life (20-29 group) have a considerably lower perseveration score than the individuals of an older age. There also seems to be a slight tendency for
In granting any association a certain degree of
independence, it is important to consider the
subsequent development and the nature of the
organization. This is especially true for those
corporations that have a long-term perspective.

The consideration of independent associations
involves not only the organizational structure,
but also the financial aspects. It is essential to
carefully analyze the financial status and
project the future financial viability.

In the context of independent associations,
the financial statements must be thoroughly
examined to ensure that the association is
self-sustained.

The examination of independent associations
also requires a careful analysis of their
dependency on external funding.

In conclusion, the consideration of
independent associations involves a
comprehensive analysis of their
organization, financial status, and
dependency on external funding.

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Note: The text appears to be a draft or a preliminary version, as indicated by the presence of underlines and annotations.
the "p" score to go down after the individual has reached 50 years of age.

4. The tests employed do not seem to give to perseveration the status of functional unity; from our data we are unable to state whether the subjects or the tests were responsible for that.

5. The new test of "rhythmic perseveration" gives some measure of validation of the results of the other tests.

6. The closer proximity of the patient to "normalcy" is also characterized by a lower perseverative tendency.

B. On the Future

We do not claim too much for these results. The contacts of perseveration with psychiatry are numerous and provide a very fertile field for further investigation. Conquest of new frontiers in this respect will be largely conditioned by the perfection of our instrumental and psychometric devices in measuring the perseverative tendency or secondary function. Like many investigators, we attempt to add our bit towards "a complete solution"—yet to be achieved.

References:


BIBLIOGRAPHY


Bernstein, G., "Quickness and Intelligence." British Journal of Psychology, Mon. Suppl., 1934, VII.


Gross, O., Die Zerebrale Sekundaerfunktion. Leipzig, p. 69, 1902.


—. "The Tenth Maudsley Lecture." *Journal of Mental Science*, 1929, 75, 357-370.


The candidate was born in the town of Merkini, Lithuania, on June 20, 1912. He is the oldest son of David J. Rabin and Sara Simon Rabin. After graduation from the local grammar school, he entered the Kaunas "Gimnazium" from which he graduated in 1929. The regular curriculum included a great deal of mathematics, physics and humanitarian studies. Hebrew, Lithuanian and German were thoroughly studied, while Russian and Polish were less important in the candidate's education.

In the year of 1930, upon his arrival to the United States, the candidate entered Northeastern University as a candidate for the Bachelor of Science degree in the department of electrical engineering. In 1934 he transferred to the Boston University School of Education, from which he graduated in 1935. The following year (1936) he received the Master of Arts degree in the department of psychology of the Boston University Graduate School. The following three years were spent at the Boston University and Harvard Graduate Schools.

The candidate was appointed fellow in the department of psychology at Boston University for the year 1935-36. He spent the following two years as graduate assistant in the same department. On various occasions
he lectured to classes at the University and substituted as an instructor in psychology at Emerson College in Boston. For the past two summers he acted as camp director at a private boys' camp. He has been engaged in research at the Boston State Hospital since last fall.
The phenomena of perseveration are recognized long ago and may be traced back to ancient philosophical literature. It is noticeable in every day life, in the uncontrollable persistence of ideas in our minds and in the after effects of previous activities and patterns of behavior upon our present actions. After sensations, after images and the like have also been included under the term perseveration.

Abstract of the Dissertation

It is not an isolated phenomenon since its existence can be explained on the basis and spontaneous discharges and "after-discharges" of nerve cells occupy the position of established facts. The plasticity and after-discharge in the nervous system, after the original stimuli or stimulating situations are mental inertia or perseveration.

The word "perseveration" as such was used, by the German psychiatrists, Reissner, for the first time. Since the end of the last century, when the term was introduced, it was employed descriptively in psychiatry. Repetitive movements or acts on the part of a mental patient, despite his desire to change his behavior, submitted in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

Phenomena of a similar nature were observed by Jung in his association experiments. Certain words have been repeated several times as responses to different stimuli words.
UNIVERSITY

DEPARTMENT OF PHILOSOPHY

Presentation of the Dissertation

Preparation in Demotic Hieroglyphs and Magic Hieroglyphs

By

Israel Yadin

Professor of Philosophy, Boston University, 1935

Abstract

In preparation for the presentation of the dissertation, the author submits the following abstract:

This dissertation is a study of the relationship between the written language of the ancient Egyptians and the hieroglyphic script. The author presents a detailed analysis of the hieroglyphic script, focusing on the relationship between the hieroglyphs and the grammar of the written language. The author also provides a comprehensive overview of the history of the script, from its earliest forms to the later stages of its development. The dissertation concludes with a discussion of the role of the hieroglyphic script in the cultural and historical context of ancient Egypt.
PERSEVERATION IN DEMENTIA PRÆCOX AND IN THE MANIC DEPRESSIVE PSYCHOSES.

The phenomenon of perseveration has been recognized long ago and may be traced back to ancient philosophical literature. It is noticeable in everyday life, in the uncontrollable persistence of ideas in our minds and in the after effects of previous activities and patterns of behavior upon our present actions. After sensations, after images and the like have also been included under the term perseveration.

It is not an isolated phenomenon since its existence can be explained on the basis of the latest developments in neurophysiology. Automatic and spontaneous discharges and "after-discharges" of nerve cells occupy the position of established facts. This automaticity and after-discharge in the nervous system, after the original stimuli or stimulating situations are removed, is in accordance with the psychologically noted "after-effect;" mental inertia or perseveration.

The word "perseveration" as such was used, by the German psychiatrist, Neisser, for the first time. Since the end of the last century, when the term was introduced, it was employed descriptively in psychiatry. Repetitive movements or words on the part of a mental patient, despite his desire to change his behavioral pattern, were considered to be demonstrations of the perseverative tendency. This repetition, usually, has an original stimulus, but the response could not be checked, while stereotypy, which was for a while considered synonymous with perseveration, is an oft-repeated activity or postural attitude which cannot be traced back to any stimulus. Phenomena of a similar nature were observed by Jung in his association experiments. Certain words have been repeated several times as responses to different stimulus words.
On the basis of accumulated clinical observations, Gross, in his theoretical treatise, posited two main principles of all mental life—the primary and secondary functions. The primary function was direct perception and thought in any form, while the secondary function was the "after-function" or the process set up after the removal of the original stimulus. According to Gross, individuals who have a longer secondary function tend to follow a narrow, but deep path in their mental life; once a process is set up, it continues for a long time. On the other hand, the shallow and broad type of person has a shorter secondary function; new stimuli take more rapidly the place of previous mental processes, since there seems to be less secondary function or perseveration. Jung's typology of introversion and extroversion follows the same general outline. He linked his types with perseveration in a similar manner.

The Dutch and English Schools set out, in the beginning of the present century, to investigate experimentally, this secondary-function (synonymous with perseveration). They had to devise tests as well as to correlate existing psychological and psychiatric categories with classes discoverable by means of those tests.

The testing methods followed the following general lines:

a. Sensory tests were devised; these tests were to measure the duration of the after-effects of different sense stimulations; i.e., the phenomenon of continuance.

b. Ideational tests which set up a definite response pattern in the subjects; the persistence of this habituated pattern was then measured by the number of responses and by the amount of interference it would show in the following of new instructions; i.e., fluency and interference.
The purpose of economic education, according to recent studies, is to help develop a sense of economic awareness and responsibility among students. The economic function as a whole, which includes production, distribution, and consumption, is essential for the proper functioning of an economy. Understanding the interdependence of these components is crucial for effective economic decision-making and problem-solving.

Economic education should focus on the principles of supply and demand, market forces, and the role of government in economic activities. Students should also be taught the importance of entrepreneurship and innovation in driving economic growth. By fostering a strong economic foundation, students are better equipped to make informed decisions in their personal and professional lives.

In summary, economic education is vital for developing a well-informed and engaged citizenry, capable of participating effectively in the economy. It is essential to incorporate a broad range of economic concepts into the curriculum to ensure students are well-prepared for the challenges of the modern world.
c. **Motor tests** in which a certain motor activity was initiated and then changed to a similar one, but not the same; the amount of perseveration being the reduction of the output in the second activity due to the after-effects and the interference of the previous one; i.e., interference.

These tests measured perseveration and, at the same time, operationally defined it; however, the functional unity of the entire group was never definitely established.

Experimental work with mental patients did not yield consistent results. In one case melancholics were considered to be higher perseverators than manics, while in another investigation the results were diametrically opposite. Other investigators have "established" the fact that manics are the lowest perseverators in the psychotic group, while manic-depressives are higher and the dementia praecox cases may be separated into two different groups of high and low perseverators. The factor of age was not investigated in connection with this work. Improvement of Dementia Praecox patients was also shown to affect the perseveration scores in the retests. The factor of training that might render the results erroneous was not taken into consideration.

The undetermined state of affairs in the relationship between psychiatric categories, age and improvement and the degree of perseveration, prompted the present investigation. It was felt that age may play a considerable role in determining the "p" score; it was also thought that high and low "p" in dementia praecox must be explained; the necessity to investigate the relationship between improved patients' perseveration-scores and those of the definitely psychotic ones, revealed itself.

Five tests of perseveration were employed in the present investigation.
Two of the tests were sensory—Adaptation to light and Electrical Threshold Sensitivity; two of the other tests were motor—the Z-tests and the Grouped Strokes tests. The fifth test was devised by the present investigator and was called "A Test of Rhythmic Perseveration." The first four tests were used in various investigations by British and American workers. In the last test the subject performs an activity keeping in time with a slow metronome, the speed of which is suddenly changed, and accordingly, the subject’s adjustment time to the new speed is considered to be a measure of perseveration. Some of the subjects demonstrated such a degree of perseveration that their speed remained constant throughout the experiment.

Two groups of patients were used. The preliminary group (A) consisted of thirty-two patients, the second experimental group (B) included eighty patients. All of these subjects belonged to two psychiatric categories—dementia praecox and manic-depressive psychoses. They were all males between the ages of nineteen and sixty.

Part of the experimental procedure was the establishment of a rapport between tester and testee. Modes of response had to be changed for some very depressed patients, while in some cases the results were rendered valueless by lack of full comprehension of the instructions and negativism on the part of certain subjects. Elimination of these results did not introduce unscientific sampling since there was no predominance of a particular diagnosis among the negativistic and unreliable subjects.

The preliminary results showed that the depressive group, which was the younger one, had the higher mean perseveration scores than did the praecox patients. There was also some positive correlation between the
The results of the recent research on the effects of various X-rays and radiations on the development of certain diseases have shown that a certain degree of correlation exists between the exposure to X-rays and the incidence of certain diseases. The third phase of the present investigation has been completed and the results are being analyzed. The findings indicate that the exposure to X-rays has a significant effect on the development of certain diseases, particularly those that are radiation-sensitive.

In conclusion, the research has revealed that the exposure to X-rays is a contributing factor in the development of certain diseases. Therefore, it is recommended that precautions be taken to minimize exposure to X-rays in the clinical setting. Further research is needed to understand the mechanisms involved in the development of these diseases and to develop effective preventive strategies.
tests and age. The difference, however, was not very significant statistically.

After the final results were computed, the following conclusions were drawn:

1. The depressive group tends to consist of high perseverators than does the group of dementia-praeox patients.

2. Within the dementia praecox group, catatonics are the highest perseverators while the paranoiacs tend to be lowest.

3. With the exception of one test, the general tendency is to establish the following sequence in order of increasing perseveration: mania, dementia praecox (paranoia, hebephrenia and simple), depression and catatonia.

4. The lowest "p" scores are obtained by the youngest age group (twenty to twenty-nine) while the others (thirty to fifty-nine) are higher perseverators.

5. The sensory tests correlate satisfactorily with each other; a similar relation exists between the motor tests; from the data obtained, however, there is little evidence of a correlation between the sensory and the motor tests.

6. Patients of improved psychiatric condition tend to be lower perseverators.

Further work with the second group of patients (B) seemed to corroborate the preliminary results. The dementia praecox sub-group investigated more thoroughly and matched so as to eliminate th