

## PERSEVERATION.

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## I.

By "perseveration" is intended the lag or persistence ("inertia") of a mental process. That is, perseveration refers to process-lag as a function of the individual. It is probably best studied in terms of the effect of its presence on another immediately subsequent process. It is indirectly manifested in the realm of mental content, and the effect is usually appreciated as "interference", "inhibition" or "carry-over", which are symptoms of its presence.

## II.

Perseveration in mental activity is by no means a new idea. Wynn Jones discerns a suggestion of it in Aristotle, and Spearman quotes from Plato. Hartley finds a mental counterpart to the idea of persistence of movement (inertia) in Newtonian physics in the persistence of sensation after the removal of the stimulus. His illustrations of the phenomenon are chiefly from the field of vision. Probably the observation of the similarity between the phenomena was the basis for his idea of vibration as an explanatory concept. Thus Hartley tells us that after an object of sensation has been removed, the sensation and its vibrations persist briefly, but become fainter the while. They may become as weak as an "idea"; repetition may make it as strong as a sensation. It is to be distinguished from memory; memory is always accurate association; association is between sensations and ideas.

Herbart advanced a similar conception, considering it, of course, as part of the dynamics of his mental "atomism". This emphasis is delightfully crystallized in Volkman, who not only sees every idea with its own dynamics, but also with a memory and imagination of its own.

## III.

It is well known that Neisser in 1894 used the term "perseveration" to describe a clinical symptom in the field of psychiatry. It was used to indicate an abnormally persistent repetition or continuance of an activity, after the activity had been once begun or recently completed. An instance would be the frequent speaking or writing of a given word or words in unsuitable places.

It is evident that the use of the term is quite a broad one. There is no indication, however, that perseveration is to be interpreted as a functional concept abstracted from the manifest activity. Furthermore, in so far as the original meaning of the term in this field can be represented, it appears to have involved no explanatory intentions.

The use of the term by contemporary and later psychiatrists accomplished what seems to be more or less inevitable in the development of language elements. The term, through redefinition and reinterpretation, became both narrowed and broadened in its application, so that its meanings became as varied as the persons using it. Perseveration was to be found referring to the nature of continuance respecting the "preceptual and purely internal" reactions, and was thus only characteristic of "ways of apprehending". Definition of the phenomenon in terms of "psychical after-images" and as "the weakness and slowness of associations" at least served to indicate an increasing psychological emphasis.

#### IV.

Experimentation of the "new" psychology was almost entirely limited to the observation of mental content as opposed to underlying process or function. As such, the association doctrine, on a background of a persistent facultism, tended to dominate its approach and problems. Thus, the first experimental data respecting perseveration were found in an investigation of memory that employed association techniques in its studies; this was the work published by Müller and Pilzecker in 1900. Perseveration was used as an explanatory concept relative to the occurrence of "errors" in memory. Thus, "after having once entered into consciousness, every idea possesses a perseverative tendency—i.e., a tendency to rise freely into consciousness." Müller's description indicated that this tendency generally dies rapidly away, that attention and repetition of the idea strengthened it, so that cumulative repetition may so establish it that it may outride immediate association. That is, "ideas will come into consciousness solely in consequence of their perseverative tendency". Foster's experiments of a later date to test the findings of Müller and Pilzecker would appear to offer nothing further; "readiness to respond" as an alternative explanation merely begs the question.

Does perseveration as it is presented by Müller indicate the mere continuance of a previous stimulation or the spontaneous and free recurrence (arousal) of the ideational content of some prior experience? This query serves well to indicate a point upon which later writers were not in agreement. Ach seems to appreciate the likelihood of this differentiation and includes both meanings in his use of the term, believing that such was the intention of Müller's employment of it. Wertheimer uses perseveration to mean both, the tendency to remain (continuance) and the tendency to return (recurrence). Foster presents Jung and Riklin as interpreting Müller to mean "merely the continuance",

while he himself looks upon his use of the term as indicating "spontaneous recurrence".

Other recent expressions of associationism make reference to perseveration. There would appear to be little change in meaning apart from singularity of expression or slight differences demanded by systematic implications. If there is any tendency toward a further crystallization of meaning, it would appear to favour the limiting of the application of the term to the phenomenon of spontaneous recurrence. The range of its utilization in explanation has been somewhat increased: Witasek spoke of a perseverative tendency of feeling, Stern of feeling-tone, Koffka of configuration, Maltzew of the pitch and the interval, and Ach of a determination. Possibly the rise of a certain experimental popularity of the concept "retro-active inhibition" was the expression of interest in an aspect of perseverative phenomena. However, within this school, perseveration has at no time been a vital centre of either speculative or experimental concern.

#### V.

That perseveration as a systematic concept has never found a very certain place in the principles of associationism is not difficult to understand. It is never experienced in its own right; it underlies a manifest content—errors, continuances, recurrences, disturbances, etc.; "all measurement of function is mediate measurement". Perseveration implies for the associationist the possibility of conscious content apart from basic experiential connection; which, in turn, suggests that the general principle of association does not tell the whole story. The difficult aspect of the situation may be indicated by stating the possible answers to the question, How may an idea be reinstated? Two occasions are known, by association and by perseverative tendency. Association refers to a demonstrable connection in experience. The latter, however, implies that ideas continue apart from association processes. This continuance may be more or less immediate in consciousness, or this continuance may not be in consciousness, but nevertheless continue (persist, persevere), and then, later, either find its way into consciousness when not inhibited by something else occupying the field, or combine with other processes active at the same moment in the production of complex processes, i.e., spontaneous recurrence. Thus it would appear that the empirical phenomena of continuance and recurrence are dependent in varying degrees upon some common underlying "function"—perseveration.

#### VI.

This condition of affairs is, however, by no means characteristic of the use of a concept of perseveration within a different systematic emphasis. Spearman's discussion of his "Principles of Cognition" and introduction of the "Two Factor" method of analysis as a psychological and scientific

technique in 1904, appears to have opened up many fertile fields for investigation. Certainly most important among these was the question of the functional bases for individual differences—that is, the abilities underlying achievement and character. Webb's early investigation respecting this general problem offered a lead that was further investigated by Lankes, and published under the title "Perseveration". This latter investigator found a background for his approach to his more specific problem already existent in the idea of "secondary function" elaborated previously by O. Gross, Wiersma, etc. This was interpreted as being akin to Müller's perseveration.

In this connection the earlier contribution of Beneke (1798–1854) should not be overlooked. For him the whole psychology of individual differences was essentially based upon three "ground-properties" ("excitability by stimulation", "powerfulness" and "liveliness"). The second "ground-property" was described as the mental "powerfulness" with which the sensory excitations are assimilated. This implies a mental intensity, suggesting the possibility of deep but comparatively isolated systems of ideas; such may plausibly enough be expected in minds where any impression, once made, tends to persist to the exclusion of other impressions. O. Gross (1910) distinguished two types of mental make-up which were said to arise out of the proportional dominance of the "primary" to the "secondary" functions of the nervous system; the "secondary function" referring to the persistence of "excitement" after the presentation has left the span of consciousness—an after-function that is further regulative of mental activity. Wiersma took over this notion, building up the theory that individual differences rest upon emotionality, activity, and the equilibratory relationship of the primary and secondary functions. He uses the phrase "the psychical after-effect" as synonymous with secondary function. It is acknowledged that this secondary function is difficult to determine, thus experimental procedure was used for its detection; Wiersma led the way in this respect.

Lankes contended that an adequate treatment of perseveration must cover the following phenomena: (a) the persistent after-effect of a sensory experience, (b) the spontaneous recurrence to consciousness of an experience without fresh stimulation, after it has for a time been out of mind, (c) the continuance, subconscious, or even completely unconscious and physiological, of the effect of past experience, even as (b) above presupposes. In the last two (b) and (c) care must be taken not to confuse perseveration with mere excellence of memory.

Spearman outlines "perseveration" and "secondary function" as supplementary. The former indicates subsequent persistence of percepts and ideas, while the latter implies their influence even after they have become unconscious. In other words, "there is a tendency with some persons for mental processes to persist in activity long after the cessation of the condition to which they were originally due." On this basis, it is proposed, that most, if not all, of the psychological "types" frequently advocated can be accounted for adequately.

Perseveration, as a systematic concept, is, to Spearman, a manifestation of individual retentivity. This retentivity is expressed in the law, "the occurrence of any mental event inclines it to occur subsequently". This law divides into two further principles, first a "disposition" to recurrence, and second, the fact that any mental event, once set going, comes to rest more or less gradually. This latter fact has been expressed in the law of "lag" or "inertia", and is formulated as follows: "Cognitive processes both begin and cease more gradually than their (apparent) causes." The "law of inertia" is the systematic expression of perseveration. It is this expression of the concept that has inspired a good deal of recent experimental research on perseveration; for example, that of Jones, Berstein, Hargreaves, Pinard, etc.

Experimental investigations have centred around three aspects of the subject, viz. : (a) the validity of perseveration and the development of pertinent psychometric procedures, (b) the relationship between perseveration and other well-known major variables, and (c) the rôle of perseveration in personality differences. Thus, perseveration has been indicated as a general functional unity, subject to isolation by psychometric procedures. It has been regarded as possibly innate, displaying no consistent sex difference for children, with a tendency toward a sex difference in adults. It has been suggested that it bears a fairly definite relationship to certain extremes of personality differences. It appears to vary independently of intelligence.

## VII.

The writer has recently carried out an experimental investigation of perseveration with separate but comparable groups of both subnormal and normal children. Respecting each group an endeavour was made to indicate the influence of this function in terms of school achievement. In the case of the subnormals the difficulties of the psychometric isolation of the function appeared to be considerably magnified, while the probable influence of the function in the well-directed educational setting of the training school seemed to be somewhat minimized. Furthermore, with this group the study indicates a tendency for behaviour difficulties to bear some relationship to perseveration; for the more persistent "difficult" cases were predominantly high perseverators, while anti-social behaviour of a sporadic type seemed to be favoured by the low perseverators. It is interesting to note agreement in this with the findings of Pinard.

With larger groups of normal children the influence of perseveration in the public school situation would appear to be somewhat more marked than in the previous situation. A similar relationship was indicated between perseveration and behaviour difficulties. Perseveration appeared to play a part respecting success in specific school subjects; the high perseverators being

favoured in literature and geography, while the low perseverators seemed to have an advantage with reading, spelling and writing. A minor additional study carried out in this situation suggested that this function may influence to a small extent the scores derived from different group tests of intelligence; the perseverator being favoured if the test is comparatively generous in its time limits. Furthermore, a relationship between academic achievement—represented by a pool of the school marks—and extreme-high perseverance and extreme-low perseveration scores, and bearing at the same time a relationship to intelligence capacity as compared with other members of the class, was clearly indicated.

The investigation favours the interpretation of the perseveration extremes as representing compensatory tendencies within the individual. There seems to be no relationship between the perseverative function and sex, grade, chronological age, or mental age. Thus the compensating tendency, already present, on coming into the academic situation is especially emphasized in those subjects of the curriculum that are favoured by it. The suggested relationship between the function and behaviour tendencies is interpreted as indicating not so much a causative relationship as a correlative functional development. Thus it is possible that the perseverative rating of an individual to some extent mirrors his pre-school training. The whole study would appear to be extremely suggestive and calls for corroborative investigations and still greater refinement of pertinent psychometric procedures.

#### VIII.

The neurological correlate to perseveration appears to have been at no time subjected to what might be termed an exhaustive treatment. Hartley suggested the dying out of "vibrations in the nerves". Müller and Pilzecker refer to a work by Müller and Schumann respecting motor adjustment wherein it is stated that "the automatic repetition or continuance of this activity" is the result of a tendency established "in certain sub-cortical motor centres". The question of central as opposed to peripheral dependence is implicit in the associationistic approach to this topic, and especially if it is considered that "after-sensation" is illustrative of "after-function". The discussion of Beneke of the "powerfulness" of function, which suggests an appreciation of the phenomenon which we now speak of as perseveration, indicated this function to be general and fundamental in all mental activity. Certainly Gross, Wiersma and Heymanns considered the function to be general and fundamental and named it on the basis of the conceived neurological functioning underlying the apparent individual differences; for "secondary-function" was that "after-function" on the part of the nervous system, which is often manifest in the "continuance of perceptions". Lankes spoke of perseveration as "an innate quality of the nervous system", but offered no further explanation.

## IX.

It would appear from this discussion that perseveration as a function making for individual differences is worthy of serious consideration in any presentation of a systematic psychology. Pertinent empirical phenomena have long been observed, and in some cases have been given careful attention. Müller and Pilzecker's suggestion of a perseverative tendency as an explanation of unassociated recall indicated a field for research. The pioneer work respecting functional tendencies underlying personality differences carried out by the Dutch school of experimental psychology opened a related field. Investigations with the factor theory techniques would appear to have substantiated the existence of a functional unity that can be spoken of as perseveration and thus to have established kinship between these various approaches. Furthermore the examination of this function in relation to various complex social settings would seem to be not only possible, but of considerable psychological value.

*Bibliography.*—Edwards, K. H. R., "The Perseverative Tendency", *Journ. of Abnor. and Soc. Psychol.*, 1933, xxviii, p. 2.—Foster, W. S., "On the Perseverative Tendency", *Amer. Journ. of Psychol.*, 1914, xxv, pp. 393-428.—Jones, L. W., "Perseveration", *Rep. Brit. Assoc. Adv. Sci.*, 1915, p. 698.—*Idem*, "An Investigation into the Significance of Perseveration", *Journ. Ment. Sci.*, 1928, lxxiv, pp. 653-659.—Lankes, W., "Perseveration", *Brit. Journ. Psychol.*, 1915, vii, pp. 387-419.—Müller, G. E., and Pilzecker, A., "Experimentelle Beiträge zur Lehre vom Gedächtniss", *Zeitschr. f. Psychol.*, 1900, Erg. 1.—Pinard, J. W., "Tests of Perseveration. 1. Their Relation to Character", *Brit. Journ. Psychol.*, 1932, xxiii, pp. 5-19.—Rogers, K. H., "Intelligence and Perseveration Related to School Achievement", *Journ. Exper. Education*, 1933, ii, pp. 35-43.—Spearman, C., *Abilities of Man*, Macmillan, London, 1927.—Warren, H. C., *History of Association Psychology*.—Wiersma, E., "Die Sekundärfunktion bei Psychosen", *Journ. f. Psychol. u. Neur.*, 1906, viii, pp. 1-24.