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Originally published in English in *Brain* (London), XXX (1907).

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THE ASSOCIATIONS OF NORMAL SUBJECTS

by C. G. Jung and Franz Riklin

For some time past, attention has been paid in this clinic to the process of association. In order to produce scientifically useful material for this, my director, Professor Bleuler, has compiled a list of 156 stimulus-words and experimented with them on all types of psychosis. In these experiments a very considerable difficulty soon presented itself. There existed no means of precisely and quantitatively separating association in abnormal subjects from that in normal ones. No work had been done giving any facts on the range of normal subjects and formulating the apparently chaotic coincidences of association into rules. In order to fill this gap to some extent and thereby to pave the way for experiments on pathological associations, I decided to collect more material on association in normal people and at the same time to study the principal conditions involved. I carried out this plan with my colleague, Dr. Riklin.

The main experimental methods are as follows: Initially we collected associations from a large number of normal people, with the intention, first, of examining the reactions to see whether they are at all subject to any law; and, next, of


2 Franz Riklin (1878–1938) was assistant physician on the staff of the Burg-hölzli at this time. From 1907 to 1913, he and Jung were active in the International Psycho-Analytical Association. For his principal publications, see the Bibliography.]
discovering whether individual patterns occur, i.e., whether any definite reaction-types are to be found. We combined with this a second experiment of a general psychological nature.

The mechanism of association is an extraordinarily fleeting and variable psychic process; it is subject to countless psychic events, which cannot be objectively established. Among the psychic factors that exert the main influence on the mechanism of association, attention is of cardinal importance. It is the factor that in the first place directs and modifies the process of association; it is also both the psychic factor that can most easily be subjected to experiment and the delicate affective apparatus that reacts first in abnormal physical and mental conditions and thereby modifies the associative performance.

Attention is that infinitely complicated mechanism which by countless threads links the associative process with all other phenomena of the psychic and physical domain in consciousness. If we know the effects of attention on the process of association, then we also know, at least in general, the corresponding effects of every psychic event that attention is capable of affecting.

These considerations led us to investigate the effects of attention on the process of association, hoping to clarify as precisely as possible the following questions:

1. What are the laws governing the range of association in normal subjects?
2. What are the direct effects of attention on the association process? In particular, does the valency of the association decrease with the distance from the focus of consciousness?

Our experiments have revealed a series of facts that not only encourage us to follow the paths on which we have set out into psychological regions but also, as we believe, fit us to do so.

C. G. Jung
PART ONE

I. GENERAL EXPERIMENTAL PROCEDURE

7 The experiments were carried out alternately by the two authors so that each one in turn undertook a series of experiments on the subjects concerned. Altogether thirty-eight people took part: nine educated men, fourteen educated women, seven uneducated men, and eight uneducated women; the age-bracket was 20–50 years. Care was taken to use, as far as possible, normal subjects for the experiment. This, however, led to unexpected difficulties, particularly with the educated subjects, as precisely on this level the concept of normality must be very elastic. Nevertheless we hope we have not deviated too far from the norm in our selection of subjects for experiment. We give the numbers of the subjects in detail and in many cases combine with this a short description of the personality, which will facilitate the understanding of possible anomalies. Naturally the two authors have also carried out the experiment on each other.

8 In noting associations we have entirely limited ourselves to those produced by calling out stimulus-words. We used altogether four hundred different stimulus-words. These, grammatically classified, are as follows:

- nouns 231
- adjectives 69
- verbs 82
- adverbs and numerals 18

9 The number of syllables was not taken into account (the stimulus-words have one, two, or three syllables). Nor were the stimulus-words arranged in definite categories as Sommer, for instance, has arranged them. On the contrary, as much care as possible was taken to see that stimulus-words of similar
forms or meaning should not follow each other, so as to avoid the subject adapting to a particular topic after one or two reactions. Through an unfortunate coincidence it happened that among the first hundred stimulus-words there were about thirty that can easily be associated according to temporal or spatial co-existence; in the second hundred there are only about twenty of these, which caused a notable difference of the co-existence association in the first and second hundred. The shortage of stimulus-words of this kind is made up by verbs. It was considered important completely to exclude difficult and rare words, in order to prevent mistakes or lengthened reaction-time due to lack of knowledge on the part of the subjects. The stimulus-words were therefore taken as far as possible from everyday life.

This consideration was all the more essential for us, as with most of our subjects we had to work under somewhat abnormal linguistic conditions. In German-speaking Switzerland the vernacular consists, as is well known, of the Swiss-German dialect or dialects, which not only deviate considerably from standard German but also show significant phonetic differences among themselves. In the schools children learn standard German as if it were a foreign language. In later life educated people gain a fairly complete knowledge of and facility in the German language. The uneducated man, however, unless he has spent a considerable time in Germany, retains at best those German phrases that he has learned at school and later learns little or no more. Nevertheless, literary German is familiar to him in printed or written form and he also understands it as a spoken language without being able to speak fluent, correct standard German himself. We tried therefore in many cases to call out the stimulus-words in the dialect form, but we soon noticed that the uneducated subjects did not understand dialect words as well as standard German. They reacted to the dialect words more laboriously and tried to react in standard German. This somewhat paradoxical phenomenon can be explained by the fact that Swiss-German is a purely acoustic-motor language, which is very rarely read or written.

Everything printed or written is in standard German. The Swiss is therefore not used to experiencing words individually but knows them only in acoustic-motor connection with others.
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If he has to say a single word without an article he will usually choose the standard German form. We therefore avoided dialect words completely in our experiments. In most cases a correct standard German reaction was given, but any reactions that were in dialect were fully accepted. The reactions were, of course, written down in the form in which they were given. To subjects who had never taken part in such experiments, their significance was first explained and practical examples of how they had to react were demonstrated to them. Not a few of the uneducated subjects thought that it was a kind of question-and-answer game, the point of which was to find an appropriate word connection to stimulus-words, e.g., house / house-cat, wild / wild cat. The experiments were never started till it was certain that the subjects understood the experiment. We stress that a case of not understanding never occurred and that general lack of intelligence was much less disturbing than affects, particularly a fairly frequent emotional obtuseness. It is of some significance that many of the uneducated came with a certain “schoolroom” attitude and a certain correct and stiff demeanour.

We organized our experiments as follows: The first two hundred reactions were noted without further conditions. The reaction-time was measured with a 1/5-second stop-watch, which we started on the accented syllable of the stimulus-word and stopped on the uttering of the reaction.² We do not, of course, presume to have in any way measured complicated psychological times by this simple procedure. We were merely concerned with establishing a general idea of a roughly average reaction-time which is in many cases not without importance, being very often of value in the classification of reactions.

After two hundred reactions, these were as far as possible classified, with the help of the subjects. With educated subjects this was always done; with uneducated subjects, who only rarely have any capacity for introspection, it was of course impossible. We had to limit ourselves to having the connection explained in particularly striking associations. The results of the experiment were divided into a first and second hundred and

² A later paper will report on time-measurements. The times were not measured in all subjects. [See below, “The Reaction-time Ratio in the Association Experiment.”]
these were written down separately. During the experiment
the psychic state of the subject was as far as possible established,
both objectively and subjectively. If for any reason physiological
fatigue occurred, we waited till the next day before doing the
second experimental series. With the educated subjects fatigue
almost never occurred during the first experiment, so that we
could continue at once with the second series in nearly every
case.

The second series of experiments consisted of one hundred
reactions which were recorded under the condition of internal
distraction. The subject was asked to concentrate his attention
as much as possible on the so-called "A-phenomenon" (Cordes)
and at the same time to react as quickly as possible, i.e., with
the same promptness as in the first experiment. By the "A-
phenomenon" we understand, with Cordes, the sum of those
psychological phenomena that are directly stimulated by the
perception of acoustic stimulus. To establish whether the sub-
ject had observed the A-phenomenon he had occasionally to
describe it after the reaction, and this was noted. On comple-
tion of this experiment new classifications were again made.
Of course, for this experiment only educated people could be
used and of these unfortunately only a selection, because it
takes a certain psychological training to be able to observe at-
tentively one's own psychic phenomena.

The third experimental series was sometimes not carried
out till the second day. It consisted of one hundred reactions
and was based on the condition of external distraction. The
distraction in this experiment was brought about in the follow-
ing way: The subject had to make pencil marks of about one
centimetre, in time with a metronome. The beat for the first
fifty reactions was 60 per minute and for the second fifty reac-
tions 100 per minute. The classification results of the first
fifty reactions and the second fifty were recorded separately
and for ease of calculation brought to one hundred. With a
very few subjects the metronome was speeded up at every
twenty-fifth reaction in order to exclude an all too quick habi-
tuation. The beat was in these cases increased from 60 to 72 and
from 100 to 108 per minute.

3 Cordes, "Experimentelle Untersuchung über Assoziationen" (1899), p. 90.
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16 The factor of habituation, in any case, unfortunately plays a large part in these experiments, as one would expect. Many people very quickly get used to a purely mechanical activity in which, in the second phase of the experiment, only the beat changes. It is difficult to introduce other disturbing stimuli of equal continuity and variability without adducing word-images, particularly when one does not wish to make too great demands on the intelligence and will-power of uneducated subjects.

17 In trying to find a suitable disturbing stimulus we were above all intent on excluding that which might have had an excitatory effect on verbal imagery. We think we did exclude such effects by our experimental procedure.

18 From these experiments three hundred to four hundred associations, on an average, were obtained from every subject. We also tried to supplement our material in other directions, in order to obtain a certain connection with Aschaffenburg’s results, and for this purpose we took associations from some of our subjects in a condition of obvious fatigue. We were able to obtain such reactions from six subjects. Associations were also taken from one subject in a state of morning sleepiness after a night of undisturbed sleep, in which the factor of fatigue was completely excluded. With one subject associations were taken when he was in a state of acute moodiness (irritability) without fatigue.

19 In this way we obtained about 12,400 associations.

II. CLASSIFICATION

1. General

20 Anyone with practical experience of work on association has been confronted with the difficult and unrewarding task of classifying the results of the experiments. On the whole we agree with Cordes\(^4\) when he says that in earlier association experiments the false assumption prevailed that the fundamental psychological phenomenon corresponds to the stimulus-word and that the connection between stimulus-word and reaction is an “association.” This somewhat too simple interpretation

\(^4\) Ibid., p. 33.
I. STUDIES IN WORD ASSOCIATION

is at the same time too pretentious, for it maintains that in the connection between the two linguistic signs there is also a psychological connection (the association). We do not, of course, share this point of view but see in the stimulus-word merely the stimulus in the strict sense of the word and in the reaction merely a symptom of psychological processes, the nature of which we cannot judge. We do not, therefore, claim that the reactions we describe are associations in the strictest sense; we even wonder if it would not be altogether better to drop the word "association" and talk instead of linguistic reaction, for the external connection between stimulus-word and reaction is far too crude to give an absolutely exact picture of those extraordinarily complicated processes, the associations proper. Reactions represent the psychological connection only in a remote and imperfect way. Thus, when describing and classifying linguistically expressed connections, we are not then classifying the actual associations but merely their objective symptoms, from which psychological connections can be reconstructed only with caution. Only in psychologically educated subjects is the reaction what it really should be—namely, the reproduction of the next idea; in all others a distinct tendency to construct something is mixed with the reaction so that in many cases it is the product of deliberation, a whole series of associations. In our association experiments we stimulate the language apparatus. The more one-sided this stimulus is, the greater the number of linguistic connections that will appear in the reaction. As we shall see, this is mainly the case with educated subjects, from whom a finer differentiation of psychological mechanisms, and therefore a greater ability for isolated application, can a priori be expected. One must therefore guard against the fallacious assumption that the educated subject has in any way more external associations of ideas than the uneducated.5 The difference will be a psychological one, as in uneducated subjects other psychological factors insinuate themselves. In the second part of this paper we shall refer to this difference.

As long as we still know so little about the connection be-

5 Ranschburg states that in uneducated subjects inner associations predominate. With Balint, "Über quantitative und qualitative Veränderungen geistiger Vorgänge im hohen Greisenalter" (1900).
etween psychic events, we must refrain from formulating the principles for a classification of external phenomena from inner psychic data. We have therefore confined ourselves to a simple logical classification, to which as a precaution it is in our view essential to limit oneself, till we are able to derive empirical laws from psychic associations.⁶ The logical principles of classification must also be adapted to the special experimental conditions, that is, to the verbal reaction. We must therefore, in classifying the associations, take into account not only the logical quality but also, if possible, all those external circumstances occurring as a result of this particular experimental design. The use of the linguistic acoustic brain mechanism naturally is not without influence on the associations. The purely intrapsychic association cannot become the object of another’s consciousness without being transformed into the familiar symbolism of language. Thus a completely new element is added to simple association, which exerts a great influence on the latter. In the first place, the results will be determined by the subject’s verbal facility; i.e., James Mill’s generally valid “law of frequency” directs the reaction even more selectively towards what one is accustomed to. Thus one of the chief principles of our classification will be that of verbal facility.⁷

22 We proceeded with the classification of associations essentially according to the Kraepelin-Aschaffenburg scheme. We preferred this system to others because in our opinion it is heuristically the most valuable. When Ziehen describes the Kraepelin-Aschaffenburg attempt at classification as a failure, this is surely a rather strong term. No one will maintain that Aschaffenburg’s classification is exhaustive; Ziehen would not want to claim that even for his own.

⁶ Aschaffenburg, too, is cautious about this and confines himself entirely to the relation between stimulus and reaction as it is reflected in speech. He insists on this, since the linguistic reaction does not by any means always tally with the simultaneous inner associations. (“Experimentelle Studien über Assoziation” (1866), p. 220.)

⁷ Trautschold says: “First and foremost in this respect is practice or habit, which facilitates certain associations so much that in the end they occur quite mechanically, and there can be no question of other reactions” (“Experimentelle Untersuchungen über die Assoziation der Vorstellungen” (1883), p. 221).
Ziehen's classification has certainly opened up most valuable vistas, but it is itself not completely satisfactory. First of all, the differentiation between "jumping association" and "judgment association" is a very doubtful one, if it is completely dependent on the presence or absence of the copula, a fact which Claparède also strongly criticizes. The complete failure of Aschaffenburg's schema should first be proved, but this has in fact not been done; on the contrary, the results based on this classification are very encouraging, so that at present one can still venture to use it, although bearing in mind its one-sidedness. The other schemas of classification are, however, biased in other ways. The criticism that Aschaffenburg's schema is biased on the side of logic is not valid, as it makes sufficient allowance for logical data as well as for sensual and perceptual connection, and also for the linguistic factor. Faced with reactions in the form of sentences, however, the schema is more or less powerless. On the other hand it must be stressed that with normal subjects sentences occur very rarely. One factor of great practical significance deserves to be stressed. Aschaffenburg's schema has been tested on a great deal of material, part of it pathological, and has proved itself of value. His 

conditio sine qua non

is not the subsequent questioning of the subjects about the reaction phenomenon, as in the schemas of Ziehen, Mayer and Orth, and Claparède; it also allows at least an approximately correct classification without the help of the subject, which is of particular importance in psychopathological experiments.

As we regard this work merely as a preliminary to psychopathological experiments, we have not hesitated to give preference to Aschaffenburg's schema. Those of Münsterberg and Bourdon appear to us as too much weighted on the side of logic; Ziehen's criticism of these, that they are unpsychological because they abstract completely from the context, is valid. Claparède's extremely subtle and penetrating suggestion (p. 226) does, however, deserve serious consideration, but should perhaps first be used on a wider range of material to test its application in practice.

In attempting the classification of acoustic-verbal associations one must never forget that one is not examining images

but their verbal symbols. The examination of associations is an indirect one and is susceptible to numerous sources of error caused by the great complexity of the process.

In our experiments we examine the resultant of an appreciable number of psychological processes of perception, apperception, intra-psychic association, verbal comprehension, and motor expression. Each of these activities leaves its traces in the reaction. In view of the great psychological significance of motility, particularly of the speech function, one must attribute above all a main role to linguistic facility. It is mainly this factor that is to be considered in classification. This principle of classification can be criticized for introducing an extremely variable and indeterminable magnitude into the calculation. We must admit that verbal facility is an extremely variable magnitude and that in an actual case it often causes difficulties, and that therefore the logical character of the classification also suffers. It introduces an arbitrary element into the classification that one would like to avoid. But, for the reasons stated above, we have nevertheless, faute de mieux, decided on this mode of classification, taking as a guiding line certain empirical rules that we shall discuss later.

By these restrictions and a thorough consideration of the subject, we hope to have avoided being arbitrary in applying this principle.

In the following nomenclature (flight of ideas, associations etc.,) it must be remembered, after what has just been said, that by this we mean primarily speech-phenomena from which we have allowed ourselves to make deductions about psychological events. Here we are fully aware that we are examining a relatively limited area, that is, associations that are for the most part reflected in the speech mechanism. Thus, when we speak of “flight of ideas,” we mean by this the speech phenomenon that is an external manifestation of internal processes. Of course, the psychological event is not necessarily reflected in toto in the form of word associations, but is only expressed in linguistic signs of that type when it affects the speech mechanism. In the flight of ideas, the actual thinking would naturally present a totally different picture if it could manifest itself directly. Thus, for example, the flight of ideas resulting from predominantly visual parts of images constitutes a special aspect
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that can hardly manifest itself adequately enough and is therefore hardly accessible to external examination; particularly in mania, it will as a rule not be accessible to examination, because of the linguistic agitation. We shall find an opportunity in a later publication\(^9\) to discuss the visual form of flight of ideas.

2. SPECIAL CLASSIFICATION

A. Internal Association\(^{10}\)

29  (a) GROUPING. We classify under this heading all associations connected by co-ordination, superordination, subordination, or contrast. The perusal of the cases in question leads to the following special classification of co-ordinations:

30  (a) Co-ordination. The two parts are linked by a similarity of content or nature; i.e., a general idea, in which both parts are contained, underlies them. Examples:

\[
\begin{array}{c}
\text{(accumulation of water)} \\
\hline
\text{lake} & \text{ocean} \\
\text{(fruit)} \\
\hline
\text{cherry} & \text{apple} \\
\text{(measurement)} \\
\hline
\text{long} & \text{narrow} \\
\text{(injustice or vice)} \\
\hline
\text{unjust} & \text{faithlessness}
\end{array}
\]

\(^9\) [No such publication has been traced.]

\(^{10}\) Ziehen (Introduction to Physiological Psychology (orig. 1891), p. 205), arguing against internal association, gives as examples the following: guest/chest, pain/rain, and remarks that these so-called internal associations are purely external and are almost completely limited to the acoustic image of words that have similar sounds. One can readily agree with Ziehen, for surely no one will want to call these examples of inner association.

We consider, with Wundt, that associative affinity is the principle of internal association and practice the principle of external association (or similarity = internal association, contiguity = outer association).
Association by co-ordination must take place within the framework of a clear-cut common general concept, but may be the result of more or less vague similarity. The similarity may be very great, so that only a nuance prevents it from being identical, e.g., *to forbear* / *leniency*. The similarity can also be very remote, so that the common meaning of the two concepts is not an essential one but a more or less coincidental attribute of the stimulus-image. In such cases the reaction appears very loosely connected with the stimulus-word and thus is distinguished from other co-ordinations. The distance of the association is, as it were, greater. Therefore these co-ordinations can to some extent be separated from those already discussed. In the loosely connected associations two categories can be distinguished:

1. The stimulus-image is linked to the reaction by a meaningful but otherwise coincidental attribute, e.g.:

   - father (worried)  
   - play (of child?)  
   - War (peace-league)  
   - murderer (to hang)  
   - sentence (contains something)  
   - star (romantic, night?)

   - worry  
   - youth  
   - Bertha v. Suttner\(^{11}\)  
   - gallows  
   - content  
   - romanticism

2. The stimulus-image is linked to the reaction by an unessential, external, mostly quasi co-existent attribute, e.g.:

   - pencil (long)  
   - sky (blue)  
   - sea (deep)  
   - table (particular shape)

   - length  
   - colour  
   - depth  
   - style

These two modes of co-ordination may be called "the connection of images according to internal or external kinship." The first category contains by far the more significant co-ordinations, and justifies to some extent the terms internal and external. The co-existence of attributes in the second category indicates that the formation of these co-ordinations is due to external association.

\(^{11}\)[Baroness von Suttner (d. 1914), Austrian writer and pacifist, recipient of the first Nobel Peace Prize, 1905.]
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As a last category of co-ordination we should like to propose "co-ordination through example." This category primarily contains reactions that are nothing but the inversions of the two previously discussed patterns:

worry father (e.g., of the father)
content sentence (e.g., of the sentence)
colour sky (e.g., of the sky)
misery old woman (e.g., an old woman is in misery)

Now, there is a series of reactions to adjectives and verbs which, although it is true that they are not grammatically co-ordinated to the stimulus-word, can nevertheless perhaps best be grouped with co-ordinations, particularly those of the examples:

to give in peace-loving foreign emigrant
to pay attention clever man to pray pious man
to despise wickedness to help good man

These associations can, if the expression be permitted, be called analytical; they are conceptions that are given, so to speak, implicitly with the stimulus-word to which they have been subordinated or superordinated. But as it is difficult, if not impossible, to distinguish this relationship with certainty in concrete cases, and as in addition the concept of the whole and the part cannot be applied to adjectives and verbs, we count these reactions also as co-ordination through example, inasmuch as among the possible nouns certain typical ones always appear in the reactions. The reactions in these cases are always extremely general and closely dependent on the stimulus-word.

The special classification of the co-ordinations would then be as follows:

(1) by common general concept
(2) by similarity
(3) by internal relationship
(4) by external relationship
(5) by example

Examples

(1) father uncle
(2) father God
(3) father worry
(4) father our house
(5) to pay attention clever man

It must be added that with these examples the rich variety of co-ordinations is by no means exhausted. With individuals who associate intensively according to subjective constellations, a whole series of different co-ordinations, which cannot really be placed in any of these categories, is possible. In these cases one can safely admit one's inability and simply content oneself with the classification "co-ordination." One can console oneself with the idea that the individual possibilities are innumerable and that no schema could ever be invented that would make possible a clear-cut classification of all associations. But there is a number of co-ordinations that could without undue strain be placed under different headings, i.e., they have no clearly defined character; one can either leave it at that or perhaps group these reactions with the type they most resemble. The headings set out above are not meant to be absolute, compulsory categories, but merely a name for empirically found types which, on occasion, however, may merge into each other without sharp boundaries. More must not be expected in our present state of knowledge of association.

(β) Subordination. The reaction is considered as a part or a minor (subordinated) concept of the stimulus-word, e.g.:

tree beech

Here we include all reactions that specify the stimulus-word, i.e., that represent special instances of the general stimulus-concept, e.g.:

house house on X street
horse Mr. X's horse
railway station Baden

In some cases there may be doubt whether the association should be considered as subordination or as predicate, e.g.:

food today's (viz., food)

(γ) Superordination. The reaction is considered as the whole or general concept of the stimulus-word, e.g.:

Osen\textsuperscript{12} town
cat animal

\textsuperscript{12} [See infra, par. 423, n. 47.]
Here too the separation from the predicate is difficult, e.g., *thirteen* / *unlucky number*. Is *unlucky number* in this case a general concept and as such includes thirteen with other unlucky numbers? In our opinion there is a predicate here; on the other hand we would include Aschaffenburg’s association *baptism* / *ancient custom* as a superordination, as *ancient custom* is a general concept that includes many other subordinate concepts.

(8) **Contrast.** The concept can be understood without difficulty. The classification and evaluation of the contrasts is much more difficult, however. Contrasts are as a rule very closely associated images, not only conceptually but also perceptually and above all linguistically. There are even languages in which only one and the same word exists to express typical contrasts. It must have been a considerable psychic achievement in the beginning of language and conscious thought to separate contrasts in speech and concept. Today, however, we have these ancient achievements in thought already formulated in the language; they are taught to us from earliest youth together with the first concepts of speech, with the first songs and reading material. We are verbally very practised in these closely connected concepts, which are very often supported by quotations and rhymes; e.g.:

<table>
<thead>
<tr>
<th>sorrow</th>
<th>joy</th>
<th>sour</th>
<th>sweet</th>
</tr>
</thead>
<tbody>
<tr>
<td>pain</td>
<td>pleasure</td>
<td>light</td>
<td>dark</td>
</tr>
<tr>
<td>good</td>
<td>bad</td>
<td></td>
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*Sauersüss* and *helldunkel*\(^{13}\) are even colloquial words in German. For these reasons we have grouped a large number of common contrasts with external associations. Here we only count associations that are not current, such as:

<table>
<thead>
<tr>
<th>friendly</th>
<th>angry</th>
<th>sense</th>
<th>stupidity</th>
</tr>
</thead>
<tbody>
<tr>
<td>good</td>
<td>sinful</td>
<td>vengeance</td>
<td>to forgive</td>
</tr>
<tr>
<td>animal</td>
<td>plant</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In spite of this detailed classification of the groupings there are still associations that cannot be put into any of the subgroups. For these there remains simply the general term “co-ordination,” e.g., the association *high* / *silk*. The stimulus-word

\(^{13}\) [Sour-sweet and light-dark, i.e., *chiaroscuro*.]
THE ASSOCIATIONS OF NORMAL SUBJECTS

high [German hoch] has been understood as a proper name; the bearer of this name [Hoch] has a silk shop; hence the reaction silk. This cannot be merely a case of co-existence; the reaction consists of two specific images that are spatially co-existent; it is therefore a rather complicated formation. One could perhaps place it under the heading "co-ordination through external connection," though admittedly on slight evidence. Therefore it is safest, for the moment, to admit that such co-ordination cannot be further classified.

Summarizing, we arrive at the following schema:

- **Grouping**
  - (a) Co-ordination: (1) by a common general concept
    - (2) by similarity
    - (3) by internal relationship
    - (4) by external relationship
    - (5) by example
  - (β) Subordination: (1) Actual subordination
    - (2) Specification
  - (γ) Superordination
  - (δ) Contrast
  - (ε) Groupings of doubtful quality

(b) Predicate. We include here, in agreement with Aschaffenburg, all judgments, properties, and activities that in any way refer to the stimulus concept as subject or object (summarized by Kraepelin under the name "predicative relationships").

It is well known that Kant divides judgments into analytic and synthetic. This principle of logical classification is of value to us only in so far as, in an analytic judgment, a part of the concept (i.e., a predicate) is presented that is necessarily inherent in the concept. Thus only that is given which already implicitly exists. But in the synthetic judgment something is added to the concept that is not necessarily already contained

---

14 *Psychol. Arb.*, I, p. 222.
15 "In an analytical judgment I do not go beyond the given conception, in order to arrive at some decision respecting it. If the judgment is affirmative, I predicate of the conception only that which was already cogitated in it; if negative, I merely exclude from the conception its contrary. But in synthetical judgments, I must go beyond the given conception, in order to cogitate, in relation with it, something quite different from that which was cogitated in it . . ." etc. Kant, *Critique of Pure Reason* (trans. Meiklejohn, 1934), p. 126.
in the concept. As regards associative performance the synthetic judgment is in a way superior to the analytic. If we approach this question practically, we find (in so far as this method of classification can in practice be applied at all) that in simple judgment-reactions the analytic judgment exists mainly in the naming of a co-existent perceptible attribute, while the synthetic judgment is mostly a value judgment with a more or less marked ego-reference. Thus we see here a relationship analogous to that between "co-ordination by external relationship" and "co-ordination by internal relationship." In the association *pencil / length, length* is essentially contained in the concept or is co-existent, while in *father / worry* the concept *worry* adds something new and therefore causes a shifting of concept. We should readily accept the grouping of judgment-reactions into analytic and synthetic if there were not a considerable practical difficulty: we have no way of knowing in the individual case whether the analytic predicate is an essential part of the concept or not. One can only attempt to decide this question if one can differentiate in individual cases between a concrete and an abstract concept. We know that Ziehen considers that he has done this by direct questioning, even of children. We not only consider this method most unreliable, but also find the distinction between concrete and abstract concepts particularly difficult. If I give a name to a mental picture, then the picture consists of a condensation of many memories, whose more concrete or more abstract aspect depends on minimal differences of perceptual vividness. In many cases even psychologically educated people would be at a loss if they had to decide whether, for example, in *house / roof* they had visualized a concrete or an abstract roof. Of course we are far from denying the existence of abstract concepts; but in concrete cases of acoustic-verbal experiments we cannot help suspecting that the so-called abstract concepts are merely words that lack individual content, only not so much because they are abstract concepts as that they are mostly linguistic formations of a motor kind, in which the other sense-impressions participate only very slightly.

For the answer to the question whether we are faced with an analytic or synthetic judgment we should have to know exactly whether the thought was concrete or abstract: e.g., *snake / green* is objectively entirely synthetic. It is not necessary
to think of green together with snake; only in the case of the image of a definite snake must green be already implicit, in which case it would be an analytic judgment. Apart from these reservations, there are other, mainly practical, difficulties which interdict this mode of classification.

In order to arrive at a special classification of the predicate we must consider the different possibilities:

1. The stimulus-word is a noun, the reaction an adjective.
2. The stimulus-word is an adjective, the reaction a noun.

We have no reason to separate these two cases, any more than the other forms of predicative connection:

1. The stimulus-word is the subject, the reaction its active or passive activity.
2. The stimulus-word is the active or passive activity of the reaction. Or:
3. The stimulus-word is the object, the reaction is the activity referring to it.
4. The stimulus-word is an activity, the reaction is its object.

Let us consider the first forms: the predicative connection of noun and adjective. Two main possibilities are to be distinguished:

(a) The adjective describes an essential and internally meaningful characteristic of the stimulus-image. One can call this type of predicate "internal." It can easily be divided into two groups:

1. Objective judgment, e.g.:

   snake  poisonous  war  bloody
   glass  fragile  grandmother  old
   mild  spring  winter  raw
   thirst  intense

   These predicates describe an essential and meaningful addition to the stimulus. Their purely objective character distinguishes them from the second group:

2. Value judgment, e.g.:

   father  good  pupil  good
   to stink  unpleasant  soldier  brave
   to ride  dangerous  wood  useful
   mountain  beautiful  murderer  base
   book  interesting  water  refreshing
In these reactions the personal element is more or less prominent; but where the ego-reference is clearly expressed in the form of wish or rejection, one can speak directly of "egocentric predicates." We do not however want to separate such reactions from value judgments as a distinct group, for reasons stated below. We also count the following as value judgments:

iron useful metal
water one of the most interesting
chemical substances
scoundrel disgrace

Value judgments expressed in the form of an activity, e.g.:

smoke stinks
apple tastes nice

are best placed with the predicates.

We also count as value judgments reactions in which a value is not stated but demanded, e.g.:

good one should be
diligent the pupil should be
to threaten one must not

Such reactions are not frequent in normal subjects; we merely mention them for the sake of completeness.

(β) The adjective refers to an external, less significant, possibly co-existent, and perceptible characteristic of the stimulus. For this type of predicate we should like to use the term "external":

tooth protruding exercise-book blue
water wavy salt granular
tree brown etc.

We assess the predicate-relation between adjective as stimulus-word and noun as reaction according to the principles explained above. Thus, in classifying, we evaluate green / meadow, meadow / green, as more or less equivalent.

Aschaffenburg has with some reason considered interjections as predicates, but we have interpreted them differently (see below).

A further sub-group of predicates is made up of the "relationships of noun and verb."
(a) The subject relation. The noun as the stimulus-word or the reaction is the subject of a definite activity:

resin sticks to cook mother
hunter to shoot

(b) The object relation. The noun as the stimulus-word or the reaction is the object of a definite activity:

door to open to clean brass
to recruit soldiers throat to strangle

The predicates so far discussed cannot easily be distinguished from the above-mentioned "co-ordination by example," if the attributive part is the stimulus-word. For this diagnosis we consider decisive the subject’s evident effort to find a reaction-word (i.e., a noun) as appropriate as possible to the stimulus-word and with a general validity, as in:

to pray pious person
to despise wickedness
to give in peace-loving

Thus we count to clean / brass as an object relation and to clean / shining metal as co-ordination by example.

Specifications of place, time, means, and purpose are somewhat loosely connected with the group of predicates (Ranschburg’s\textsuperscript{16} “end-defining association”).

\begin{itemize}
  \item place: to go into town
  \item time: to eat 12 o’clock
  \item means: to beat with a stick
  \item purpose: wood for burning
\end{itemize}

One can sometimes, with these reactions, be in doubt about whether perhaps they are to be interpreted as specification and therefore belong to subordinations. But in most cases the decision will be easy, so that error will not be too great. Definitions or explanations of the stimulus-word, which in general occur very rarely, have a certain connection with the group discussed above, for which reason they too have been placed in the group of predicative relations. Examples:

door noun star heavenly body
blue adjective

\textsuperscript{16} Ranschburg and Balint, p. 715.
I. STUDIES IN WORD ASSOCIATION

The predicative relations are thus made up of the following groups:

Predicative Relations

- I. Noun and adjective
  - (a) Internal predicate
  - (β) External predicate

- II. Noun and verb
  - (a) Subject relation
  - (β) Object relation

- III. Determination of place, time, means, and purpose
- IV. Definition

(c) CAUSAL RELATIONSHIP (Münsterberg). Stimulus-word and reaction are linked by a causal connection. Examples:

pain tears

to cut painful

B. External Associations

(a) CO-EXISTENCE. The connection of co-existence is contiguity or simultaneity, i.e., the link between the two concepts is not exclusively similarity or affinity but also temporal co-existence or immediate succession. Spatial co-existence is included in temporal contiguity as spatial co-existence results from succeeding sense-impressions. Examples:

ink pen pupil teacher
exercise-book knife table chair
table soup lamp family
Christmas Christmas tree mother child
Sunday church institution warder

We also include here reactions like:

to ride horse to ride saddle
to see
eye ear to hear
pencil
paper
exercise-book to sing

to write
to calculate school

24
The associations with *to write* are complexes of school-memories, the connection of which is conditioned by simultaneity; the other examples concern reactive images associated with the stimulus images by co-existence.

(b) **Identity.** The reaction contains no shift or development of the sense, but is a more or less synonymous expression for the stimulus-word.

(a) The synonymous expression is taken from the same language as the stimulus-word. Examples:

- grand
- magnificent
- to pay attention
- to take notice (in Swiss-German usage, essentially synonyms)
- to squabble
- quarrel

(β) The synonymous expression is taken from a language other than the stimulus-word, i.e., it is a *translation*. Examples:

- stamp
- timbre
- Sunday
- dimanche

(c) **Linguistic-motor Forms.** (Ziehen:¹⁷ “Current word-compounds and associative word-complements.” Kraepelin-Aschaffenburg:¹⁸ “Linguistic reminiscences.” Trautscholdt:¹⁰ “Word association.”) In this sub-group of external associations we collect together all connections of images, which have been canalized through verbal practice, although logically and historically they may have a different meaning and therefore could be put into one of the types mentioned above. In dealing with *contrasts* we have already mentioned a series of reactions that we interpreted as being of such common verbal practice as to be canalized. We classify them as

(a) **Canalized verbal associations.**

(1) Simple contrasts. Examples:

- dark
- light
- white
- black
- sweet
- sour
- like
- unlike


¹⁸ Psychol. Arb., I, p. 223.

I. STUDIES IN WORD ASSOCIATION

(2) Current phrases. Examples:

| hunger | to suffer | something | more |
| house | and home | force | to apply |
| of age | to come | bread | to earn |
| goods | and chattels | head | to bow |
| thanks | to give | bird | bush |
| gallant | to be | water | to drink |
| trials and tribulations | to swim | to be able to |
| world | and people | tram | to ride |
| old | frail | to go | for a walk |
| right | to do | revulsion | to arouse |
| to come | (and) go | cat | mouse |
| place | time | to break | the news |

(β) Proverbs and quotations. Examples:

- everywhere and nowhere war and peace
- liberty equality more light
- everywhere I am at home meat drink
- eye tooth
do's and don'ts

(γ) Compound words.
(1) The reaction-word complements the stimulus-word and forms a compound word. Examples:

| table | leg | frog | blood |
| needle | case | book | marker |
| mat | hanging | head | scarf |
| piano | player | tooth | ache |
| vengeance | to thirst for | institute | women's |

The reaction may also be such that the stimulus-word is repeated in the reaction, e.g.:

| tears | tearduct | foot | football |
| to knock | to knock at | star | starlight |
| to hear | to hear out | sweet | sweetmeat |

20 [In German, Grund/und Boden (bottom/and ground), an expression referring to the hospital grounds.]
21 [In German, Kind/Kegel (child/bastard); Kind und Kegel is a folk expression for "the whole family."]
22 [Goethe's dying words.]
23 [Matte/Hänge = Hängematte, 'hammock,' originally a hanging mat. Some of these compounds are untranslatable.]
24 [Referring to someone who is "cold-blooded."]
25 [The actual example, Tränensack, refers to the lacrymal sac.]
THE ASSOCIATIONS OF NORMAL SUBJECTS

(2) The reaction is essentially only a grammatical variation of the stimulus-word (Wreschner:28 "Association with inflectional form").

<table>
<thead>
<tr>
<th>to die</th>
<th>dead</th>
<th>to find</th>
<th>found</th>
</tr>
</thead>
<tbody>
<tr>
<td>kindling</td>
<td>to kindle</td>
<td>love</td>
<td>to love</td>
</tr>
<tr>
<td>to hammer</td>
<td>hammer</td>
<td>cab</td>
<td>cabby</td>
</tr>
<tr>
<td>school</td>
<td>scholar</td>
<td>murderer</td>
<td>to murder</td>
</tr>
</tbody>
</table>

(8) To this should be added a small group of reactions that can be termed anticipatory. Examples:

<table>
<thead>
<tr>
<th>dark red</th>
<th>light</th>
<th>grandiose</th>
<th>small</th>
</tr>
</thead>
<tbody>
<tr>
<td>slow</td>
<td>short</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(e) Interjections, which only rarely occur, have been placed in the category of "linguistic-motor connections" although, as Aschaffenburg stresses, they represent a predicate. We justify our interpretation by pointing out the highly imperfect linguistic form of the reaction, which moreover contains a very strong motor component. Examples:

<table>
<thead>
<tr>
<th>grand</th>
<th>ah!</th>
<th>to love</th>
<th>oh!</th>
</tr>
</thead>
<tbody>
<tr>
<td>to stink</td>
<td>pooh!</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

C. Sound Reactions29

The content of this group corresponds to Aschaffenburg's group of "stimulus-words acting only by sound."

(a) Word completion. We interpret these words in agreement with Aschaffenburg, only including here reactions that together with the stimulus-word, form an indivisible word. Examples:

<table>
<thead>
<tr>
<th>wonder</th>
<th>-ful</th>
<th>modest</th>
<th>-y</th>
</tr>
</thead>
<tbody>
<tr>
<td>love</td>
<td>-ly</td>
<td>friend</td>
<td>-ly</td>
</tr>
</tbody>
</table>

---

26 [The German, aufhören, means to listen attentively.]
27 [In the German language there is the generic term Spielball, meaning a ball used for any game.]
29 ["Sound" = German Klang, also translated in the Coll. Works as "clang."]
I. STUDIES IN WORD ASSOCIATION

We also consider addition to the stimulus-word, to form a name, as word-completion. Example:

Canter -bury
Winter -bourne

(b) SOUND. The reaction is conditioned solely by the sound of the whole stimulus-word or its beginning. Examples:

enchain enchant intention intestine
mercenary merciful to roast roast beef
humility humidity

(c) RHYME. Examples:

dream cream king ring
heart smart crank plank
leave smart
leave

To divide sounds and rhymes into "meaningful and meaningless," as Aschaffenburg does, is not worthwhile, owing to the rarity of the "meaningless" ones. We have therefore refrained from doing this.

D. Miscellaneous

This not very large group comprises reactions for which no place can be found in the rest of the schema, but which have only a very limited connection with each other.

(a) INDIRECT Association. Aschaffenburg, as is well-known, contrasts the indirect mode of reaction with all other reactions, which he regards as "direct" ones. We have rejected this quantitatively most disproportionate contradistinction, because with uneducated subjects one can never know how many different contents of consciousness stand between stimulus-word and reaction. We cannot even ourselves always state how many conscious, half-conscious, or unconscious constellations affect our reactions. We will not enter here into the academic contro-

30 [The examples given by Jung are Laufen (to run)/burg and Winter/thur, both giving the name of a town.]
31 [Jung's examples (except for to roast/roast beef), being untranslatable, have been replaced by similar pairs of English words.]
32 [Some of the rhyming pairs have been replaced by English equivalents.]
verses about indirect association (that is, whether the intermediate link is conscious or unconscious) but confine ourselves to stating the phenomenon of the indirect mode of reaction within the framework of our cases. We call "indirect association" that mode of reaction that is intelligible only on the assumption of an intermediate link different from the stimulus-word and the reaction. We distinguish five forms:

83 (a) Connection by common intermediate concept. Examples:

- white  far  dozen  144
- snowfield  heap
- false  blonde  turbid  shallow
- Miss X is false and blonde  water
- repentance  black  red  scent
- mourning  flower
- to close  round  bicycle  round
- to turn  wheel
- to disgust  odourless  to walk  pear
- to stink  under pear-trees
- fast  to whistle  to turn  earth
- locomotive  to rotate
- hay  green  rich  5-franc piece
- grass  roll of money

84 It must be noted that in these associations the intermediate link is usually clearly conscious. Such reactions are very rare and occur almost entirely in individuals of markedly visual type.

85 (b) Centrifugal sound-shift (Aschaffenburg's "paraphasic indirect association"). There is an inner reaction that is to a greater or lesser extent clear and meaningful, which, however, in the process of articulating it, is replaced by a canalized association with a similar sound. We therefore designate this
1. STUDIES IN WORD ASSOCIATION

group of indirect associations as "centrifugal sound-shift." Examples:\textsuperscript{33}

\begin{center}
\begin{tabular}{ll}
decision & to slide \\
\quad (to decide) & \\
stubborn foolish & to dress excessive \\
\quad (mulish) & \quad (overcoat) \\
to quarrel to shoot & earth house \\
\quad (dispute) & \quad (heap) \\
hair blue & medal fastness \\
\quad (blonde) & \quad (fastened) \\
sacrifice to castrate & love crate \\
\quad (casket, sacristy) & \quad (hate) \\
ears typhus & pairhoot \\
\quad (tubes) & \quad (boot)
\end{tabular}
\end{center}

\textsuperscript{86} Cordes wants to exclude these reactions from the indirect ones, admittedly, from his point of view, with some justification. The direct inner association appears to be a genuine association and not a sound reaction; so there exists an entirely appropriate and direct intention which, however, at the moment of enunciation, is shifted towards a similarity of sound to the detriment of the meaning. Such shifts can only occur when the inner image to be expressed does not command the intensity of attention necessary to set going the appropriate speech-mechanism. Deviations into by-ways only occur when what has to be enunciated is not intense enough, i.e., it does not reach a sufficient degree of consciousness. Therefore we also assume that, in spite of correct intention, the intermediate link has remained abnormally obscure, which agrees completely with the accounts of subjects who can observe themselves. Some had no more than a feeling that they had not said the right thing, without being able to point to the intermediate link. Whether in such cases the shift towards similarity of sound occurs at the sending station or the receiving station seems to us irrelevant to the evaluation of the reaction.

\textsuperscript{87} (γ) Centripetal sound-shift. The stimulus-word is internally replaced by a sound similarity, which in its turn determines the reaction. Usually the intermediate link is in that case half-con-

\textsuperscript{33} [Most of the original examples are not translatable, so equivalents have been found.]
THE ASSOCIATIONS OF NORMAL SUBJECTS

scious or unconscious. It must be noted that in all cases here classified the stimulus-word has been correctly understood, so that it is not merely a case of misunderstanding. Examples:

- to ride slip (slide)
- to swallow bird (swallow)
- strong sin (wrong)
- malt pepper (salt)
- politics hefty (policeman)
- stroke knot (string)
- to hit to bite (to smite)
- malt vinegar (salt)
- lazy mist (hazy)
- to rust fair (just)
- room to caw (rook)
- stroke cigar (smoke)
- to wallow throat (swallow)
- to love turtle (dove)
- pleasure tape (measure)

88 In our experience by far the largest number of indirect associations are shifts through sound similarity. What we have said in the preceding paragraph about the consciousness of the intermediate links also applies here. The occurrence of a sound association points to a stimulus-word with an inadequate feeling-tone. Reaction to the intermediate sound-link is likewise a result of insufficient feeling-tone of the stimulus-word. In this case the sound association is, in our experience, as indistinct as the stimulus-word, and at first the subject is even unsure of the kind of stimulus-word. The reaction is innervated before the act of apperception has taken place.

34 [Many of the original examples, being untranslatable, have been replaced by English equivalents.]
35 Intensity of attention; see above, par. 86.
36 Münsterberg maintains that, in order to stimulate associations, the external excitation does not first have to be converted into a conscious process, but that, between external excitation and conscious central excitation, there is a non-conscious stage in which an association-process takes place that does not reach consciousness (Beiträge zur experimentellen Psychologie, IV (1892), p. 7). Nevertheless, Münsterberg denies the occurrences of indirect associations through conscious intermediate links (ibid., p. 9).
(§) Centrifugal and centripetal shift through word-completion or linguistic-motor association. Examples:

<table>
<thead>
<tr>
<th>Standard filter</th>
<th>Head block</th>
</tr>
</thead>
<tbody>
<tr>
<td>(solution)</td>
<td>(blockhead)</td>
</tr>
<tr>
<td>False faithfulness</td>
<td>Angel heart</td>
</tr>
<tr>
<td>(faithful)</td>
<td>(hard)</td>
</tr>
<tr>
<td>Rats poisonous</td>
<td>Clean flea</td>
</tr>
<tr>
<td>(poison)</td>
<td>(unclean)</td>
</tr>
<tr>
<td>To cook coachman</td>
<td>Painter beautiful</td>
</tr>
<tr>
<td>(the cook)</td>
<td>(painting)</td>
</tr>
<tr>
<td>Avarice patient</td>
<td>Lockjaw teeth</td>
</tr>
<tr>
<td>(pathological)</td>
<td>(jaw)</td>
</tr>
<tr>
<td>Armlet foot</td>
<td>Permanently to certify</td>
</tr>
<tr>
<td>(arm)</td>
<td>(deranged)</td>
</tr>
<tr>
<td>Horrible grey</td>
<td>To roll round</td>
</tr>
<tr>
<td>(gruesome)</td>
<td>(roller)</td>
</tr>
<tr>
<td>Look-out strike</td>
<td>Fox finger</td>
</tr>
<tr>
<td>(lock-out)</td>
<td>(foxglove)</td>
</tr>
</tbody>
</table>

(ε) Shift by several intermediate links. The intermediate links may be associations that are mechanical yet of high valency. The reactions in this category are very rare and are mostly of abnormal origin. All the types described above can of course be found among these reactions. Examples:

<table>
<thead>
<tr>
<th>Ink</th>
<th>Acid</th>
<th>Revenge</th>
<th>Rector</th>
</tr>
</thead>
<tbody>
<tr>
<td>(red)</td>
<td>litmus</td>
<td>(right)</td>
<td>rectify</td>
</tr>
<tr>
<td>Bird</td>
<td>Mouse</td>
<td>Tough</td>
<td>Headache</td>
</tr>
<tr>
<td>(flutter)</td>
<td>bat [Fledermaus]</td>
<td>(tooth)</td>
<td>Ache</td>
</tr>
<tr>
<td>Lithe</td>
<td>Big</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(lice)</td>
<td>Small</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

We shall not at present look further into the theory of indirect association in acoustic-verbal experiments. For the moment let us simply say that these associations are closely connected with variations in concentration.

(b) Meaningless reactions. In moments of emotion or embarrassment reactions are sometimes given that are not words or are not associations.

We of course separate assonances as sound reactions from...
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