

# THE METHODS OF KURT LEWIN IN THE PSYCHOLOGY OF ACTION AND AFFECTION

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With the translation into English of books by Professor Köhler<sup>1</sup> and Professor Koffka<sup>2</sup> and the publication of papers by them in American journals,<sup>3</sup> the American psychologist has had sufficient opportunity to become acquainted with some aspects of Gestalt psychology. The papers of Helson<sup>4</sup> have also greatly helped to further the chief tenets of this school among us. At the same time there are several fields of Gestalt investigation almost unknown in America today. The purpose of this paper is to call attention to the work being done under the direction of Professor Kurt Lewin in the fields of action and affection. From the standpoint of the Gestalt psychologists very interesting results are being obtained, only a part of which have as yet been published.<sup>5</sup>

The experimental psychologist, particularly in the field of

<sup>1</sup> 'The Mentality of Apes,' New York, 1925.

<sup>2</sup> 'The Growth of the Mind,' New York, 1925.

<sup>3</sup> 'The Psychologies of 1925,' Clark University publication.

<sup>4</sup> 'The Psychology of Gestalt,' *Amer. J. Psychol.*, 1925, 36, 342-370, 494-526; 1926, 37, 25-62, 189-223. Also printed in assembled form.

<sup>5</sup> This paper is concerned chiefly with 'Untersuchungen zur etc.' (Titles 1-4 of the appended bibliography). A complete bibliography of Lewin's psychological papers is, however, appended for those who wish to trace Lewin's work leading up to these problems.

The writer, who was working in the Berlin laboratory while most of the investigations were at an experimental stage, has been able to obtain the proof sheets or the manuscripts of such as have not yet been published, and has thus through the kindness of Professor Lewin been enabled to include the most recent material in his survey. Such experiments as are reported without definite reference are taken from manuscripts or proof sheets and cannot be referred to directly.

The plan of this paper will be to outline Lewin's methods and concepts as developed on his program papers (1), (2) and show how these methods are working out in concrete experimental problems. It will be necessary to follow the argumentation of the program papers rather closely, developing in some detail the ideas to which Lewin gives much careful and thorough analysis.

the higher mental processes has up till now been inclined not to insist upon an absolute validity for his psychical laws. He has tended rather to a set of laws which are qualitatively limited, open to constant exception. Let the subject have a headache, let his attention wander, or his emotional balance be upset, and the law no longer applies in the particular instance. We have scarcely ever had laws as the scientist understands laws, but rather statistical regularities. Lewin's first point is that we must look for laws that hold under all conditions, both quantitatively and qualitatively. We must firmly restate the possibility of absolute laws in psychology. By so doing we can put the psychological experiment on a firmer basis and greatly increase its possibilities.

In the last generation the psychologist, thus dealing merely with statistical regularities, chose as his criterion of the successful experiment, verification through repetition.<sup>6</sup> In sciences which are based on true laws, experimentation is not limited to finding repeatable experiments. A single individual case suffices to prove or disprove an hypothesis providing that the conditions governing this case are sufficiently controlled. Moreover such a limitation obliged the psychologist to deal largely with situations far removed from everyday experience. What we really are, or should be, interested in psychologically is not the exceptional but rather the everyday phenomenal experience. Emphasis of the extraordinary which has persisted into the psychology of today is a remnant of a psychology that was more a collection of curiosities than a systematic science.

Another characteristic of psychology of the past was its essential atomism. All former experimentation on will, action and affection was done in an attempt to find the elements at work in such processes. When found they were put together additively as so many mere parts or items of an accidental whole. We know now that many acts are of a unitary nature and the first task of the experimenter is to see if the act he is dealing with is of such a unitary or Gestalt type.

<sup>6</sup> For a more thorough discussion of the scientific theoretical aspects see 'Gesetz' etc. (5).

To do this he must turn from the microscopic to the macroscopic type of experimentation. In the act of writing, the response shows certain definite Gestalt qualities in the way the lines are formed, the rhythm in placing the letters on the page, and so forth; an attempt to reduce writing to  $a + b + c$ —different microscopic movements—loses the essential in the process. From the standpoint of Gestalt theory the total activity, as well as the surrounding field in which it is embedded has to be taken into consideration.<sup>7</sup> Equally important moreover is the make-up of the inner or psychic field. A person attempting to copy a fancy Spencerian handwriting and then sitting down and writing off a letter to a friend is performing two completely different acts. Writing a letter is not writing in the former sense at all. The actual hand movements are more like the movements of the mouth in speaking, something merely accessory to the real act—*i.e.* the imparting of information. The motor components here represent no independent moment in the total act. They are embedded rather in the whole psychic act of imparting information. These psychic processes are also usually of a Gestalt nature.

Other complications have to be considered. Similar results by no means imply similar activities in achieving them. Performances where practice plays a part, can by no means be considered as in every case identical. Typewriting, to give an instance, demands from the beginner and from the finished typist two completely different types of motor action. The actual seeking of letters by the beginner and the touch method of the adept are different single moments in the whole process. The same achievement, then, does not imply the same psychical process.

Lewin now comes to an important distinction which must be made in considering behavior. Psychologists in the past were constantly confusing the phenomenal and the conditional-genetic sides of acts. Two acts can be phenotypically quite different and genotypically identical—or the reverse.

<sup>7</sup> The term 'Umfeld,' 'surrounding field,' is used by the Gestalt theorists to denote this setting of outward conditions and larger activities, without a knowledge of which we cannot determine the significance of an act.

Thus an embarrassed child may exhibit its shyness in blushes and confusion, or it may become loud-voiced and assertive—the two modes of behavior are genotypical equivalents. On the other hand the play-acting of emotion and real emotion may be said to resemble each other phenotypically, although genotypically quite opposite.<sup>8</sup>

In any science real laws are descriptions of the conditional genetic type. That is, a law is simply a description of a genotype. Former psychologists have confused the phenomenal with the conditional-genetic in that they have used externalities, mere adhesions, as causal factors. The contiguity of *a* and *b* was the supposed cause of *a* reproducing *b* in the basic law of association. The same holds for the coupling together of the conditioned and the unconditioned stimulus in the conditioning process. The fact that the unconditioned becomes adequate is by no means a causal explanation for any response. There must be definite sources of energy to refer back to. Lewin finds these in psychic tensions which govern the whole act in the sense of energetics. Such a tension striving towards discharge supplies the energy for, and is thus the cause of the behavior. In the intensity of the stimulus itself is to be found no source of energy. For this the stimulus is inadequate. The energy which will cause a starving man to quicken his footsteps at sight of a loaf of bread, to seize it and devour it, is clearly not to be looked for in the loaf of bread itself. On the other hand without the loaf of bread there would have been no such quickening of the footsteps, no such display of energy. The function of the stimulus is to influence and control the energy supplied by the tension. The manner in which it may do this is three-fold. It may cause a tension to be set up, it may bring an already existing tension into play, or thirdly, it may control the motor action by acquiring a stimulating character, positive or negative (*positive oder negative Aufforderungskarakter*). When a stimulus is of this character it has the function of directing or steering the

<sup>8</sup> Lewin goes somewhat more fully into the concepts of genotype and phenotype for all the sciences in 'Gesetz' etc. (5).

action in the field of behavior. When the particular action is fulfilled, the tension is discharged and the psychic energy returns to a state of equilibrium. An example will make this clear. A child, absorbed in its play, suddenly espies a piece of chocolate on the table out of its reach. A tension is induced by the perception of the chocolate which acquires a positively stimulating character.<sup>9</sup> The child puts its hand out for it but cannot reach it. The table is too high. Its actions, as we see, are directed entirely by the forces in the field of behavior (*Feldkräfte*). The stimulus is the chief of these, but other forces, obstacles, act as barriers which prevent its reaching it directly. It runs *away* from the table, tries to attract its mother's attention, fails, finally drags a chair across the room, climbs on to it, and in this way reaches the desired piece of chocolate. Follows a reduction of the tension and a return of the system to equilibrium. A moment later the child may perceive its Teddy Bear or some other toy, and the whole story will start over again until this tension too is discharged and equilibrium is again restored.

Thus we see that psychic tensions, like physical ones, tend to come to a state of equilibrium. This tendency need only be exhibited by the system as a whole. Parts of the system can progress towards a heightening of the tension in those parts, but the final stage is always equilibrium.<sup>10</sup> Then again tensions become stable and lose—phenomenologically, that is—their tendency to discharge. Wishes and half-finished acts represent tensions of this type. But as soon as the proper situation arises, fulfillment of the wish will occur and the unfinished act will be resumed. We will meet definite experimental evidence for these views later on.

On first view this theorizing resembles certain behavioristic concepts in American psychology. Such resemblance is,

<sup>9</sup>The case of the starving man and the loaf may be taken as an example of the second way in which a stimulus may function. The tension, due to hunger, is already in existence, and is brought into play by the perception of the stimulus, in this case the loaf of bread.

<sup>10</sup>That such systems exist purely physically has been shown by Köhler, 'Die physischen Gestalten,' Erlangen 1924. Cf. also v. Bertalanfy, 'Die Bedeutungen, etc.,' *Biol. Zent.*, 1927, 47.

however, only superficial. In the first place Lewin is making no attempt to establish a physiological correlation. The tensions are not physiological tensions. Whether or not they have physiological parallels or are ultimately to be referred back to the physiology of the organism are not questions which here interest him. He is dealing with purely psychic tensions, operating in a definite psychical field.<sup>11</sup> The tendency within this field towards a reduction of tension and to a state of equilibrium is the cause of behavior. Moreover, the reaction, instead of being a mere mechanical response to the stimulus, is governed by all the forces in the field of behavior. It is dependent—and here we see the Gestalt pattern—on the field forces and on the changing field relationships between subject and stimulus, here let us say between the child and its candy. Indeed, once a child is ‘satiated’ and has had as much candy as it can eat, ten pieces of chocolate in the ‘surrounding field’ will have no power to induce a new tension; the chocolate has lost its stimulating character. It may even in fact develop a negatively stimulating character, and what before attracted may now repel.<sup>12</sup>

Lewin we see is here introducing a causal dynamic factor which is missing from behaviorism, and which enables him to treat his facts from a conditional-genetic standpoint instead of recounting them as so many examples of phenotypes. These tensions moreover cannot be dismissed by the behaviorists as mere inventions of Lewin’s, introduced by him to support his theories, to be regarded, if not exactly in the same category as their own concepts of visceral tension, at

<sup>11</sup> By this must not be understood phenomenological field. The two are not even always parallel. The strength of a psychic tension by no means corresponds with the strength of phenomenological desire. Many tensions are indeed unconscious. I will in passing pick up a book from the floor or straighten a cover without even realizing I am doing so. Lewin is no mere introspectionist.

<sup>12</sup> Another word of warning is perhaps here necessary lest we should imagine that Lewin in making use of such concepts as force, system, tension, is necessarily referring these back to physics. Such a question he leaves open. He points out that such dynamic concepts are valid outside physics and are being used today in other sciences, such as the science of economics. He maintains indeed that they are rather to be considered as the basic concepts of a new logical system—the Logic of Dynamics.

any rate as parallel suppositions, equally remote from actual proof. Lewin is able, in direct experiment both to show the existence of psychic tensions and to measure their intensity.<sup>13</sup> This is his great advance. He has opened up a new experimental field, amenable to direct and tangible investigation and proof. Along the lines of memory, habituation, volition—almost all paths of activity—he has started investigations which substantiate his theories and besides disclosing further facts with regard to their own functioning, suggest new problems to explore. He no longer merely describes, he experiments.

In summarizing Lewin's first paper we see that as causal factors governing behavior we must find sources of energy which cannot be mere couplings nor the stimulus alone. These energies are to be found in psychic tensions which tend to discharge so that the psychical field returns to equilibrium. Their influence, in a causal-dynamic sense, extends into phenomenological, physical and physiological fields, without however their belonging directly to any one of them. The energy due to the tension is the actual cause of the behavior which is governed in its course by the forces in the outer field as well as the inner.

In Lewin's second paper (2) we find further theoretical considerations and the first experimental results. He begins by attacking the problem of volition. Here we have hitherto had few satisfactory investigations because under the term Will has been placed a very heterogeneous group of phenomena. Lewin drops all inquiry into the phenomenology of willing and proceeds to study dynamic causes. The process of intention or purpose is usually considered to fall into a motivating process, an imagined solution, and the carrying out of the imagined solution, due to its association with the real opportunity of carrying it out.<sup>14</sup> Such was the association theory of voluntarily controlled behavior. The actual motor for carrying out any act—let us say, posting a letter—

<sup>13</sup> Cf. Zeigarnik's experiments, in which the strength of the tension is measured by its influence upon memory in the retention of acts performed.

<sup>14</sup> For a review of the literature on the Will, Purpose, etc. see Lindworsky, 'Der Wille.'

was due to the association of a real mail-box with the posting rehearsed in the imagination. That such a coupling cannot be a causal factor Lewin has shown both theoretically and experimentally in the problem of measuring will against association.<sup>15</sup> Furthermore, the association theory will not stand in face of everyday obvious facts. In the first place, after the act is fulfilled, we find no tendency to attempt another fulfillment when confronted with a new opportunity. The association hypothesis would imply a strengthening of the association and hence a tendency to repetition. Thus, I have a letter to mail and decide to mail it when I pass the post-box on my way to the office. I do so and pass the same post-box ten times again that day without even thinking of the mailed letter. Secondly, the act of fulfillment may vary decidedly from the original imagined one; a friend may drop into my room and I give him the letter to mail. Once again I find no tendency to mail the letter as I pass the box. One more criticism of the many that Lewin advances may be mentioned. I decide to give the letter to my friend whom I am expecting. He fails to keep his appointment and on my way to the office I mail the letter myself. Here we have a simple case of 'preconceived act' (*Vornahme*) which may or may not be executed in the intended manner. Lewin believes that a psychic tension is set up upon the occasion of writing the letter, which like all tensions is a force in the direction of discharge. The line of discharge will be governed by internal and external field forces.

Thus Lewin has developed a dynamic psychological concept which we may take as the starting-point of experiment. Moreover we are attacking the problem from the conditional-genetic side, instead of, with the behaviorists and reflexologists, becoming confused on the study of phenotypes. The experimental work to prove the existence of this tension and to measure it, we will deal with later. (Cf. the experiments of Ovsiankina which show that when an act is interrupted the tension behind it remains to cause its resumption.)

<sup>15</sup> See Lewin's papers on this problem (6), (7). To be sure more modern investigators have supposed 'determining tendencies' and other dynamic factors to help out association, but as Lewin points out, the critique can be carried on to them with little difficulty.

Forgetfulness in the sense of failure to carry out an intended act, due to what is popularly thought of as absent-mindedness, can also be more adequately explained by Lewin than by his predecessors. As a usual thing the intended act is not forgotten when the system in which it is embedded is active. Forgetting may be due to a compensatory fulfillment of the intended act. For instance, I make a note of something I wish particularly to remember and forthwith dismiss it completely from my mind. Here we have a compensatory fulfillment. The 'writing it down' has compensated for the actual fulfillment. 'Forgetting' in the Freudian sense (*Vergessen*) is accounted for in that the intended act comes into direct collision with tensions built up on 'genuine needs' (*echte Bedürfnisse*). The tensions built up upon these 'needs' are dynamic structures which are open to measurement and investigation.

I leave unmentioned other theoretical implications to go on to Lewin's concepts of genuine (*echte*) and derived-needs (*quasi-Bedürfnisse*) which are the sources of energy in volitional behavior. Our reactions, contrary to some sensationalistic viewpoints, are to real things and situations. Certain things in our environment have or acquire the stimulating character (*Aufforderungscharakter*) already mentioned. This stimulating character varies and may be negative as well as positive. It is, as we have pointed out, nothing inherent in the stimulus itself, but is due to the relationship between tensions and the forces in the field of behavior. The mirror which constantly stimulates me positively to go and admire myself in it loses this character absolutely when I require it as a piece of apparatus. I do not so much as glance in it. Through satiety (*Sättigung der Bedürfnisse*) the positively stimulating character of a situation may become negative. From the standpoint of energetics we have a complete discharge of the tension, with a new tension built up in the opposite direction. Thus the need and the stimulating character are different aspects of the same general dynamic concept. We can measure the amount of the need by the stimulating character of the stimulus with which it is connected.

The 'genuine needs' are due to upsets in the equilibrium of the organism and are manifested by tensions which exert real forces. These are something more than the drives of other dynamic psychologies. They may be measured on actual physiological change in the organism concerned, but in many cases we can show their existence psychologically and deal with them experimentally, while physiological changes are, with our available instruments, quite immeasurable. The needs may be of an outright physiological nature such as hunger or sex, or they may be socially conditioned such as the need to follow a certain career, the need of the artist for a certain type of self-expression.

The tension back of a preconceived act is termed a derived need by Lewin. This is not to be understood in the old sense of a mere coupling between the stimulating character of a situation and the need. Factually the derived need represents a tension as real as that of a genuine need. The execution of the preconceived act leads to a discharge of this tension and the disappearance of the derived need. When the tension is too great, it may break out before the actual intended situation presents itself. In the same way a genuine need may suddenly discharge in overt behavior. The stimulating value of a situation is, as we have seen, dependent on the need and increases in proportion to the same. A starving man will eat with avidity things that would repel him in his normal condition. Fixation is important. The stimulating character of the situation in which the first discharge of a function occurs, *i.e.*, the first satisfaction of a need, tends to become strangely positive. This is well known in genuine needs (as for instance in sex) but it can also be shown to occur in the fulfillment of preconceived acts. The tension then discharges automatically under certain situations. The jump from here to habit is not a great one.

Compensatory fulfillment (*Ersatz-Erledigung*) plays an important rôle. Lewin distinguishes between three types of compensation. In the first case fulfillment is brought about by some difference arising in the intended situation. I meet my friend and give the letter to him instead of mailing it

personally. Or there may be a *pars-pro-toto* compensation. I go upstairs to fetch something and forget to bring it down with me. Thirdly, we have substituted compensation (*Surrogat-Erledigung*). Jilted by his best girl, the disappointed lover is all too often 'caught on the rebound.' Or the baby cries for the moon and is content with a penny whistle. This type of compensation is closely related to the symbolism of Freud. Of the possibility of testing Freudian mechanism experimentally, we shall speak later. (*Cf.* Dembo's experiments.)

There is furthermore an essential relationship between the genuine and the derived need. The derived need as manifested by the preconceived act is always built up on some genuine need. I write my friend a letter out of an actual desire for his company. When the intended act stands in direct opposition to some genuine need it can never be fulfilled. This is particularly illuminating in certain facts about hypnosis. Thus we cannot instruct a subject to commit murder. That the derived need is built up on a genuine need, we shall see later. Indeed the difference between the two is, in the last resort, only a difference in degree. The derived need must have its foundation in the genuine need.

With such evidence as he has here gathered together, Lewin sees the importance of reconsidering our volitional concepts. In the first place the rôle of the 'preconceived' act is a much smaller one than is generally supposed. How often in real life do we intend—that is, with the accompanying imaginative processes—to do things before we actually do them. Such terms as will and purpose Lewin discards and draws a distinction instead between controlled and uncontrolled behavior (*beherrschte und unbeherrschte Handlungen*). 'Uncontrolled' behavior is guided entirely by the forces in the field in which it occurs—thus including internal psychical as well as external physical forces. Thus an outburst of rage is due to inner psychic forces but is an example of uncontrolled behavior. 'Controlled' acts are also subject to field forces, but here the organism as a coherent system

has the upper hand. 'Volitional behavior' can thus be placed in neither category exclusively. It may be controlled or uncontrolled; a child makes up its mind to go past a dog but scuttles by in an uncontrolled and purely instinctive manner. The driver on the other hand who by a skillful swerve avoids sudden catastrophe exhibits controlled behavior without any preceding 'intention.'

Here we have Lewin's own description of the essence of intention. "In an intention the individual so transforms the outer and inner field for a future moment, that he will then, even though his behavior may be uncontrolled, accomplish what he has now in mind. Preconceiving only occurs when the individual foresees that a situation will arise where he would otherwise instinctively behave differently." The child resolves not to take more than two pieces of cake at the party. One's daily tasks are performed without any such preconceived intentions.

Thus we can account for every possible variation in the method of execution of an intended act, which as we have seen the association theory cannot do. In a separate category belongs absolute decision (*Entschluss*). This occurs when the entrance to the motor component for a tension is made possible in a way that did not exist before. The *fiat* of James accompanies this, clearing the path.

The intended act and the derived need are not isolated mental phenomena but are embedded in different complexes and stand in communication with other derived and genuine needs. A tension due to a genuine need discharges when the need and a definite situation come together. Thus the actual type and execution of intended acts depends largely on field forces.

We have now covered the essential points of Lewin's program papers. We find developed dynamic concepts such as tension and field that are conditional-genetic at the same time. Essentially Lewin views behavior as tensions discharging in definite fields. It now remains for him to give us his actual evidence for the existence of these tensions and his manner of measuring them.<sup>16</sup> We come then to the

<sup>16</sup> The other side of the question—How do the tensions in the organism actually arise?—Lewin admittedly leaves for the present unanswered.

experimental work on these problems, and take up Zeigarnik's paper 'on the retention of completed and incompletely acts' (3).

We have seen that it is not necessary for the imagined opportunity to present itself before the preconceived act shows a tendency in the direction of discharge. Instead of that, the intended act is characterized by the derived need and its dynamically equivalent tension. This tension will make itself felt in every possible direction, and the purpose of Zeigarnik's experiments is to show its presence when an act has not been completed and to show the effect of such a tension upon memory performances related to the act.

She sets out to measure the difference in the retention of interrupted and completed acts. The tension in the first place remains, in the second it is discharged through the fulfillment.

The experiments were performed on 164 subjects, children, students, teachers; and two group experiments, over 40 to the group, were held.

The procedure was to give the subject twenty-two simple tasks to perform and allow him to finish one-half of these, to interrupt him in the other half. Immediately afterwards he was asked to list them. The order was unessential to the listing. Needless to say the acts were interrupted in chance order, different ones interrupted in different experiments and the usual repetition controls used.

I give a few of the acts called for:  
To write down a poem from memory.  
To draw one's monogram.  
To draw a plan of a particular section of Berlin.  
To string beads.  
To count backwards from 55.  
To solve simple match puzzles.  
To find two triangles (out of thirty all different) which fitted together to form a square.

The subject's introspection was taken after the list was made. Thus there was a control over the subject's insight into the purpose of the experiment, his attitude towards

it, the degree of indifference, etc. The results of the experiments are given in terms of the quotient  $RI/RC$  that is retained interrupted retained completed. The first experiment showed that the arithmetic mean of  $RI/RC = 1.9$ , i.e. the interrupted tasks were retained much better (90 per cent) than the completed acts; the single subjects showed quotients varying from 6 to .75. The results of the individuals showed that in 17 cases  $RI/RC > 1$ , in two cases = 1, and in only three cases  $< 1$ . A repetition with different subjects and different tasks gave practically identical results. Also the group experiments showed for adults a.m. of  $RI/RC = 1.9$ , for children a.m. of  $RI/RC = 2.1$ .

The introspection showed that very rarely did a subject see the point of the experiments. They were usually assumed to be intelligence tests or something entirely different from what they really were. The motivation was usually discovered to be (1) ambition to excel, (2) feeling of duty towards experimenter, (3) interest in the task itself.

It is interesting to note that subjects often objected to the interruption and attempted to resume the interrupted acts.

To show that the retention is not due to the shock of interruption, experiments were performed where half of the experiments were interrupted and later allowed to be completed, the other half remaining unfinished.

In this case the quotient  $\frac{R(I + C)}{RI}$  i.e.

$$\frac{(\text{Retained interrupted and later completed})}{(\text{Retained interrupted})} = 1.9.$$

The same results, we see. A further experiment with the same subjects in which the two methods were combined correlates for the individual subjects  $\rho = 90$  (Spearman rank difference method).

To meet the explanation that the interrupted are better retained than the completed because the subject might expect to finish them later, experiments were conducted in which the subject was told at each interruption 'we'll finish

that later,' with such emphasis on the finishing later that we should expect  $RI/RC$  to rise. It becomes, however, lower than formerly, 1.7.

All other possibilities are considered and controlled, and we must find the cause of the retention in the tension set up by the derived need behind the intended act. These tensions persist and become evident in the better retention of  $RI$ .

The results so far are not astounding. It is to be noticed, however, that  $RI$  for all cases stands at about 7. The variation in  $RI/RC$  is localized in  $RC$ . Introspection showed that certain subjects viewed the listing as a memory test, others as merely the final task of a series. When these groups are separated,  $RI/RC$  for those that viewed the listing as merely another task, rises to 3.8! Thus, besides the tension due to the quasi-need we have others in force. These others work in different degrees and further experimental analysis exhibits them. In cases where the subject is not satisfied with the completion a very high percentage is returned, those interested in the experiments show an increase in  $RC$  while  $RI$  remains constant. Other controls and analyses we do not mention through lack of space.

Zeigarnik comes to the following conclusions. There is an actual tension present due to the derived need, that works towards the completion of an act begun and also affects the retention of this act. The amount of this retention is dependent on the intensity. When the subject's ambition is aroused, that is, when a genuine need is raised,  $RI/RC$  grows enormously. Acts which naturally have a definite completion point, arouse a much stronger tension than those which have no such definite end position. Tensions are not set up unless there is a certain stability in the whole psychic field. In cases of fatigue and excitability no tensions are set up. Subsequent emotional upsets can cause existing tensions to explode (thus making  $RI = RC$ ). After a certain lapse of time, *i.e.*, in the course of a few days, the tension also disappears from natural causes, again making  $RI = RC$ . Children show a greater tendency to develop tensions than adults. Lewin through Zeigarnik's work has been able to

prove the existence of psychic tensions and measure them in different situations.

The second paper of the series, by Schwarz, deals with 'Regressions in Rehabituation.' The former studies of regression, among others those of Münsterberg, have all been from the standpoint of quantitative performances, such questions as the possibility of rehabituation, the time necessary, etc., being those considered. Lewin is interested from the conditional genetic side. What are the tensions operating, how do they operate, what is the nature of the process of rehabituation?

The experiments set up by Schwarz require the subject to go through a series of acts, which form a connected whole (*Handlungsganzheit*). One of these acts in the series is varied in its method of execution. It is in this act that we find regressions (reversions to an habitual type of behavior). The apparatus used was very simple. A marble is placed in a trough and drops into a closed box. It is then ejected from the box by pressing a lever, caught in the hand, and placed in a tray. The variation was in the lever component, which could be set by the experimenter so that instead of pressure, lifting was required.

To summarize briefly the results of these experiments. When one develops in the subject the habit of pressing the lever in carrying out the whole act and then changes the arrangement so that the lever must be lifted, a certain number of performance errors result. These fall under two heads, errors due to regression where there is an actual drive towards carrying out the habitual act, and errors due to confusion where there is no drive but merely doubt in the subject's mind as to which to do. In both cases these errors are graded from actually executed errors to a mere tendency towards error.

That either type of error occur, the change must be made in a part of a total act, that is, in one part of an act that can be viewed as an integrated whole. In other cases there is no tendency towards regression or confusion errors. The part changed cannot be the chief act or there is also no regression.

In other words errors only occur when a dependent part of a Gestalt act is changed.

We have to distinguish between habits based on instinct or drive, as in the case of the drug fiend, and mechanical habits of action, such as we acquire, for instance, in the way we switch on or off the electric light. The case in hand is an example of the latter. The energy responsible for the execution of the part action, whether it is the correct re-habituation or the regression, is obtained from the derived need which is responsible for the total act. There is no independent source of energy. The reason why mistakes occur is that this part action has become embedded as an absolutely dependent part in the Gestalt of the total action; there is no other source of energy present to correct this until it is finally overcome by an increasing amount of self-control, which enables the parts of the total-action to become more directly dependent on the derived need and less embedded in the Gestalt of the total act.

When we change the act back to the old original habit act, *i.e.*, in our example pressing instead of lifting, the reversion errors become decidedly less. Theoretically we are dealing now with a two-track structure. There are two possible motor tracks over which the tension may discharge; after changing the original act to the rehabituated act several times, the tendency to regression is zero.

At this level there are no longer errors of regression, but confusion errors often manifest themselves. This occurs when the two-track motor system is thoroughly built up. If one greatly increases the positively stimulating character of the lever either as pusher or lifter, the action right from the beginning proceeds smoothly and without error.

When we summarize the results, we find that we are not dealing psychologically with a mere summary of movements,  $a + b + c + d + e$ , but that the total integrated act is of a Gestalt nature. When we have developed habitual response of the pushing type, we can represent this as follows,  $a(b.c.d.)e$ . *A* represents choosing a marble, *b.c.d.* throwing it in the trough, pushing the lever, catching it, and *e*, placing it in the tray.

When we change  $c$  (pushing) to  $c_2$ , lifting, the general Gestalt nature is changed. Hitherto  $a$  and  $e$  were relatively independent part actions as against the relatively interdependent group of the three actions  $b.c.d$ . To enable  $c$  to be successfully replaced by  $c_2$ , this Gestalt formation must be broken up and  $c$  becomes emphasized, so that the total act now looks like this ( $ab$ )  $c_2$  ( $de$ ); in this way the other variant  $c$  is kept suppressed. Additional experiments not yet published serve to bring out further the Gestalt nature by showing that no regression errors occur when all the parts of the middle act are changed and when it is no longer a case of a difficult transformation (*Umgestaltung*), or isolating a part act that has become deeply embedded in another configuration. Lewin, we see, is thus able to attack the problem of re-habituation from the conditional-genetic side and we gain some insight into its nature.

Another paper, by Ovsiankina 'On the resumption of interrupted acts' is now in the process of publication. It deals with further manifestations of the derived needs and tensions in experiments similar to those of Zeigarnik. Whenever an act is begun, a tension is set up. What happens to this tension when the act is interrupted? That it remains to influence memory is shown by the Zeigarnik experiments. Ovsiankina shows that when an act is interrupted there remains in the subject a natural tendency towards resumption. Tasks similar to those in the Zeigarnik experiment were set. The interruptions were either 'disturbance' interruptions such as deliberate requests from the experimenter to start something new or 'chance' interruptions. There were several kinds of chance interruptions. The lights went off automatically, the experimenter dropped a drawer and requested the subject to help pick up the contents, etc. The subjects were occasionally interrupted by being asked to give introspections; several other such devices were also made use of. The tasks set were also divided into end acts, or those with a definite finished point, and continuous acts, those upon which an indefinite amount of time could be spent. A puzzle belongs to the first type, while drawing lines at a certain

distance from each other on a piece of paper is an example of the second. The procedure was simply to note whether or not the subject resumed or showed any tendency to resume the interrupted act. Only twenty seconds were allowed for the resumption.

The first experiment showed that of the C.I. (chance interruptions) 100 per cent were resumed. Of the D.I. (disturbance interruptions) 91 per cent were resumed. Needless to say only about half of the tasks were interrupted.

That the resumption was not due to mere boredom with the situation, was shown by the insertion of a pause for rest after completed acts. No desire for mere activity was exhibited. When the experimenter expressly forbade resumption, resumptions of an underhand nature occurred. That is, the subject took up the task again in a sly manner when the experimenter was not looking. That it was not mere interest which caused the activity, was shown by the introspections of the subject. The acts in themselves (*cf.* list in Zeigarnik) are not of the type to arouse interest in adults. In addition, acts positively unpleasant to the subject were often undertaken.

Experiments were also done on the influence of the time of interruption. It was found that tasks interrupted towards the beginning were invariably resumed. This 100 per cent falls occasionally to 60 per cent around the middle of the task, but rises again to 80 per cent in the end spurt. Experiments also yielded examples of compensatory and crude fulfillment.

Actual fulfillment, as we have seen in the Zeigarnik experiments, discharges the tension. Ovsiankina found there was no tendency to resume a task which had once been completed. Acts which normally have no interest for the subject acquire a positively stimulating character when the derived need and tension towards completion is once set up. Thus we have additional proof of the validity of Lewin's concept of psychic tension.

From the other investigations in this series which have not been published I choose a few that give clear results.

Birnbaum finds that 'forgetting' in the sense of failing to carry out an intended act can be experimentally shown at times to be due to compensatory fulfillment. Thus in a series of tasks the subjects were instructed after completion of each task to write their names on the papers. The task of monogram writing served usually as compensation and with this task the name was forgotten with astounding regularity. Other examples of marked compensatory fulfillment have been found by Dembo. The subject was required to throw rings over a bottle (an almost impossible task) and a certain amount of satisfaction and hence discharge was found to occur when these were thrown over hooks or near-by articles. In instructing the subject to obtain certain flowers that could not be reached, it was found that others which could, but which from the standpoint of the experimenter were worthless, served to discharge tension.

Lewin's general manner of attacking a problem is worthy of a few words. The experimental situations chosen, as we have seen, make use of total acts. Rather than validity through repetition Lewin stresses validity through careful control and variation. Careful records of the course of each experiment are made. After each experiment a complete introspection is taken. The interpretation is always, however, from the descriptive protocol. The introspections are only treated as decisive when, all other factors being equal, the results are capable of a two-fold interpretation. Particularly useful is Lewin's use of the film to secure as thorough a record as possible. Whenever practical he secures a cinematographic record of the course of behavior.<sup>17</sup>

Let us now sum up what Lewin has actually accomplished. At this point the American psychologist may at first be inclined to be dubious. Surely, he will say, the outcome of such experiments as those of Zeigarnik, Schwarz and Ovsiankina are statistical regularities of no very marked predictive value. Where are the absolute psychological laws of which Lewin has made so much? Such a criticism would

<sup>17</sup> For Lewin's use of film see particularly 'Filmaufnahmen' etc. (9) and 'Kindlicher Ausdruck' (10).

mean a complete misunderstanding of Lewin's attitude. He is not yet able to set up his laws, but is simply in a position to show the material from which they must eventually come. That is, he has shown that any law must be a genotypic description of behavior, that the associationists and behaviorists have confused the genotypic and the phenotypic. He is able logically to prove the existence of tensions, to measure them roughly and indicate that dynamic laws must be in terms of energy exchanges and field equations. His most important contribution is methodological rather than factual.

His factual contribution, however, should not be underestimated. The investigations are also pedagogically interesting. Certain results tend to corroborate and shed light on the Freudian and Adlerian mechanisms. These concepts, behind which a great deal of value undoubtedly lies, have hitherto received no adequate experimental criticism from the laboratory psychologists. Roughly speaking, Freud, too, is dealing in genotypes. Thus we can see compensation experimentally investigated by Dembo. From Zeigarnik's experiments we see certain corroboration of the Freudian doctrine of memory. In pointing out the possibility of laboratory experimentation on psychoanalytic mechanisms, Lewin has done something that will tend to clarify our heterogeneous science. That he is not yet able to measure with great exactness lies in the newness of real dynamic concepts for psychology. One remembers that the first electric potentials were measured on the legs of a frog, that the clock was not possible as a time-piece before the days of Galileo. Lewin is certainly able to set up, measure and predict psychic energies with as much accuracy as the physicist used in the early days of dynamic concepts in his science. Like all pioneers, his work, rather than to dictate finished laws, has been to indicate directions and open up new paths of experiment from which the laws must eventually come.

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