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A LABORATORY STUDY OF FEAR: THE CASE OF PETER

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As part of a genetic study of emotions¹, a number of children were observed in order to determine the most effective methods of removing fear responses.

The case of Peter illustrates how a fear may be removed under laboratory conditions. His case was selected from a number of others for the following reasons:

1. Progress in combating the fear reactions was so marked that many of the details of the process could be observed easily.

2. It was possible to continue the study over a period of more than three months.

3. The notes of a running diary show the characteristics of a healthy, normal, interesting child, well adjusted, except for his exaggerated fear reactions. A few descriptive notes show something of his personality:

Remarkably active, easily interested, capable of prolonged endeavor A favorite with the children as well as with the nurses and matrons . . . Peter has a healthy passion for possessions. Everything that he lays his hands on is his. As this is frequently disputed by some other child, there are occasional violent scenes of protest. These disturbances are not more frequent than might be expected in a three-year-old, in view of the fact that he is continually forced to adjust to a large group of children, nor are they more marked in Peter's case than in others of his age. Peter's I. Q. at the age of 2 years and 10 months was 102 on the Kuhlmann Revision of the Binet. At the same time he passed 5 of the 3 year tests on the Stanford Revision. In initiative and constructive ability, however, he is superior to his companions of the same mental age.

4. This case is a sequel to one recently contributed by Dr. Watson and furnished supplementary material of interest in a genetic study of emotions. Dr. Watson's case illustrated how a fear could be produced experimentally under laboratory conditions². A brief review follows: Albert, eleven months

¹The research was conducted with the advice of Dr. John B. Watson, by means of a subvention granted by the Laura Spelman Rockefeller Memorial to the Institute of Educational Research of Teachers' College.

²Watson, J. B., and R. R. Studies in Infant Psychology, Scientific Monthly, December 1921.

of age, was an infant with a phlegmatic disposition, afraid of nothing "under the sun" except a loud sound made by striking a steel bar. This made him cry. By striking the bar at the same time that Albert touched a white rat, the fear was transferred to the white rat. After seven combined stimulations, rat and sound, Albert not only became greatly disturbed at the sight of a rat, but this fear had spread to include a white rabbit, cotton wool, a fur coat, and the experimenter's hair. It did not transfer to his wooden blocks and other objects very dissimilar to the rat.

In referring to this case, Dr. Watson says, "We have shown experimentally that when you condition a child to show fear of an animal, this fear transfers or spreads in such a way that without separate conditioning he becomes afraid of many animals. If you take any one of these objects producing fear and uncondition, will fear of the other objects in the series disappear at the same time? That is, will the unconditioning spread without further training to other stimuli?"

Dr. Watson intended to continue the study of Albert in an attempt to answer this question, but Albert was removed from the hospital and the series of observations was discontinued.

About three years later this case, which seemed almost to be Albert grown a bit older, was discovered in our laboratory.

Peter was 2 years and 10 months old when we began to study him. He was afraid of a white rat, and this fear extended to a rabbit, a fur coat, a feather, cotton wool, etc., but not to wooden blocks and similar toys. An abridgment of the first laboratory notes on Peter reads as follows:

Peter was put in a crib in a play room and immediately became absorbed in his toys. A white rat was introduced into the crib from behind. (The experimenter was behind a screen). At sight of the rat, Peter screamed and fell flat on his back in a paroxysm of fear. The stimulus was removed, and Peter was taken out of the crib and put into a chair. Barbara was brought to the crib and the white rat introduced as before. She exhibited no fear but picked the rat up in her hand. Peter sat quietly watching Barbara and the rat. A string of beads belonging to Peter had been left in the crib. Whenever the rat touched a part of the string he would say "my beads" in a complaining voice, although he made no objections when Barbara touched them. Invited to get down from the chair, he shook his head, fear not yet subsided. Twenty-five minutes elapsed before he was ready to play about freely.

The next day his reactions to the following situations and objects were noted:

Play room and crib	Selected toys, got into crib without protest
White ball rolled in	Picked it up and held it
Fur rug hung over crib	Cried until it was removed
Fur coat hung over crib	Cried until it was removed
Cotton	Whimpered, withdrew, cried
Hat with feathers	Cried
Blue woolly sweater	Looked, turned away, no fear
White toy rabbit of rough cloth	No interest, no fear
Wooden doll	No interest, no fear

This case made it possible for the experiment to continue where Dr. Watson had left off. The first problem was that of "unconditioning" a fear response to an animal, and the second, that of determining whether unconditioning to one stimulus spreads without further training to other stimuli.

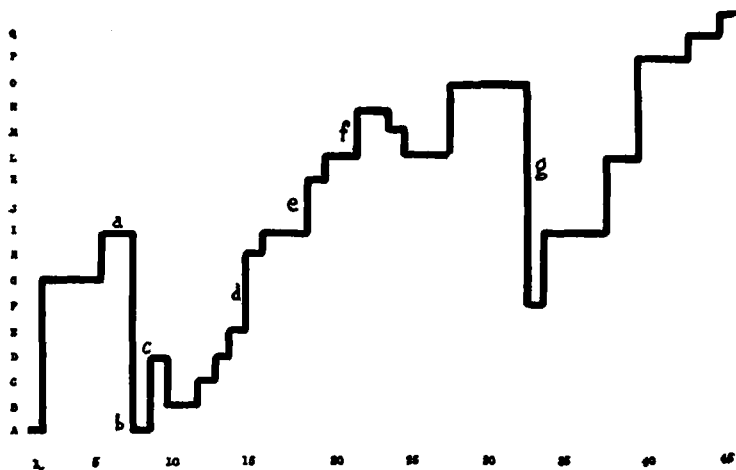
From the test situations which were used to reveal fears, it was found that Peter showed even more marked fear responses to the rabbit than to the rat. It was decided to use the rabbit for unconditioning and to proceed as follows: Each day Peter and three other children were brought to the laboratory for a play period. The other children were selected carefully because of their entirely fearless attitude toward the rabbit and because of their satisfactory adjustments in general. The rabbit was always present during a part of the play period. From time to time Peter was brought in alone so that his reactions could be observed and progress noted.

From reading over the notes for each session it was apparent that there had been improvement by more or less regular steps from almost complete terror at sight of the rabbit to a completely positive response with no signs of disturbance. New situations requiring closer contact with the rabbit had been gradually introduced and the degree to which these situations were avoided, tolerated, or welcomed, at each experimental session, gave the measure of improvement. Analysis of the notes on Peter's reactions indicated the following progressive steps in his degrees of toleration:

- A. Rabbit anywhere in the room in a cage causes fear reactions.
- B. " 12 feet away in cage tolerated.
- C. " 4 " " " " "
- D. " 3 " " " " "
- E. " close " " "
- F. " free in room tolerated.
- G. " touched when experimenter holds it.
- H. " touched when free in room.
- I. " defied by spitting at it, throwing things at it, imitating it.

- J. Rabbit allowed on tray of high chair.
- K. Squats in defenseless position beside rabbit.
- L. Helps experimenter to carry rabbit to its cage.
- M. Holds rabbit on lap.
- N. Stays alone in room with rabbit.
- O. Allows rabbit in play pen with him.
- P. Fondles rabbit affectionately.
- Q. Lets rabbit nibble his fingers.

These "degrees of toleration" merely represented the stages in which improvement occurred. They did not give any indications of the intervals between steps, nor of the plateaus, relapses, and sudden gains which were actually evident. To show these features a curve was drawn by using the seventeen steps given above as the Y axis of a chart and the experimental sessions as the X axis. The units are not equal on either axis, as the "degrees of toleration" have merely been set down as they appeared from consideration of the laboratory notes with no attempt to evaluate the steps. Likewise the experimental sessions were not equi-distant in time. Peter was seen twice daily for a period and thence only once a day. At one point illness and quarantine interrupted the experiments for two months. There is no indication of these irregularities on the chart. For example, along the X axis, 1 represents the date December 4th when the observation began. 11 and 12 represent the dates March 10 A. M. and P. M. (from December 17 to March 7, Peter was not available for study).



The question arose as to whether or not the points on the Y axis which indicated progress to the experimenter represented real advance and not merely idiosyncratic reactions of the subject. The "tolerance series" as indicated by the experimenter was presented in random order to six graduate students and instructors in psychology to be arranged so as to indicate increase in tolerance, in their judgment. An average correlation of .70 with the experimenter's arrangement was found for the six ratings. This indicates that the experimenter was justified from an a priori point of view in designating the steps to be progressive stages.

The first seven periods show how Peter progressed from a great fear of the rabbit to a tranquil indifference and even a voluntary pat on the rabbit's back when others were setting the example. The notes for the seventh period (see a on chart) read:

Laurel, Mary, Arthur, Peter playing together in the laboratory. Experimenter put rabbit down on floor. Arthur said, "Peter doesn't cry when he sees the rabbit come out." Peter, "No." He was a little concerned as to whether or not the rabbit would eat his kid-die car. Laurel and Mary stroked the rabbit and chattered away excitedly. Peter walked over, touched the rabbit on the back, ex-ulting, "I touched him on the end."

At this period Peter was taken to the hospital with scarlet fever. He did not return for two months.

By referring to the chart at (b), it will be noted that the line shows a decided drop to the early level of fear reaction when he returned. This was easily explained by the nurse who brought Peter from the hospital. As they were entering a taxi at the door of the hospital, a large dog, running past, jumped at them. Both Peter and the nurse were very much frightened, Peter so much that he lay back in the taxi pale and quiet, and the nurse debated whether or not to return him to the hospital. This seemed reason enough for his precipitate descent back to the original fear level. Being threatened by a large dog when ill, and in a strange place and being with an adult who also showed fear, was a terrifying situation against which our training could not have fortified him.

At this point (b) we began another method of treatment, that of "direct conditioning." Peter was seated in a high chair and given food which he liked. The experimenter brought the rabbit in a wire cage as close as she could without arousing a response which would interfere with the eating.

Through the presence of the pleasant stimulus (food) whenever the rabbit was shown, the fear was eliminated gradually in favor of a positive response. Occasionally also, other children were brought in to help with the "unconditioning." These facts are of interest in following the charted progress. The first decided rise at (c) was due to the presence of another child who influenced Peter's reaction. The notes for this day read:

Lawrence and Peter sitting near together in their high chairs eating candy. Rabbit in cage put down 12 feet away. Peter began to cry. Lawrence said, "Oh, rabbit." Clambered down, ran over and looked in the cage at him. Peter followed close and watched.

The next two decided rises at (d) and (e) occurred on the day when a student assistant, Dr. S., was present. Peter was very fond of Dr. S. whom he insisted was his "papa." Although Dr. S. did not directly influence Peter by any overt suggestions, it may be that having him there contributed to Peter's general feeling of well being and thus indirectly affected his reactions. The fourth rise on the chart at (f) was, like the first, due to the influence of another child. Notes for the 21st session read:

Peter with candy in high chair. Experimenter brought rabbit and sat down in front of the tray with it. Peter cried out, "I don't want him," and withdrew. Rabbit was given to another child sitting near to hold. His holding the rabbit served as a powerful suggestion; Peter wanted the rabbit on his lap, and held it for an instant.

The decided drop at (g) was caused by a slight scratch when Peter was helping to carry the rabbit to his cage. The rapid ascent following shows how quickly he regained lost ground.

In one of our last sessions, Peter showed no fear although another child was present who showed marked disturbance at sight of the rabbit.

An attempt was made from time to time to see what verbal organization accompanied this process of "unconditioning." Upon Peter's return from the hospital, the following conversation took place:

E.: (experimenter) What do you do upstairs, Peter? (The laboratory was upstairs).

P.: I see my brother. Take me up to see my brother.

E.: What else will you see?

P.: Blocks.

Peter's reference to blocks indicated a definite memory as he played with blocks only in the laboratory. No further response of any significance could be elicited. In the laboratory two days later (he had seen the rabbit once in the meantime), he said suddenly, "Beads can't bite me, beads can only look at me." Toward the end of the training an occasional "I like the rabbit," was all the language he had to parallel the changed emotional organization.

Early in the experiment an attempt was made to get some measure of the visceral changes accompanying Peter's fear reactions. On one occasion Dr. S. determined Peter's blood pressure outside the laboratory and again later, in the laboratory while he was in a state of much anxiety caused by the rabbit's being held close to him by the experimenter. The diastolic blood pressure changed from 65 to 80 on this occasion. Peter was taken to the infirmary the next day for the routine physical examination and developed there a suspicion of medical instruments which made it inadvisable to proceed with this phase of the work.

Peter has gone home to a difficult environment but the experimenter is still in touch with him. He showed in the last interview, as on the later portions of the chart, a genuine fondness for the rabbit. What has happened to the fear of the other objects? The fear of the cotton, the fur coat, feathers, was entirely absent at our last interview. He looked at them, handled them, and immediately turned to something which interested him more. The reaction to the rats, and the fur rug with the stuffed head was greatly modified and improved. While he did not show the fondness for these that was apparent with the rabbit, he had made a fair adjustment. For example, Peter would pick up the tin box containing frogs or rats and carry it around the room. When requested, he picked up the fur rug and carried it to the experimenter.

What would Peter do if confronted by a strange animal? At the last interview the experimenter presented a mouse and a tangled mass of angleworms. At first sight, Peter showed slight distress reactions and moved away, but before the period was over he was carrying the worms about and watching the mouse with undisturbed interest. By "unconditioning" Peter to the rabbit, he has apparently been helped to overcome many superfluous fears, some completely, some to a less degree. His tolerance of strange animals and unfamiliar situations has apparently increased.

The study is still incomplete. Peter's fear of the animals which were shown him was probably not a directly conditioned fear. It is unlikely that he had ever had any experience with white rats, for example. Where the fear originated and with what stimulus, is not known. Nor is it known what Peter would do if he were again confronted with the original fear situation. All of the fears which were "unconditioned" were transferred fears, and it has not yet been learned whether or not the primary fear can be eliminated by training the transfers.

Another matter which must be left to speculation is the future welfare of the subject. His "home" consists of one furnished room which is occupied by his mother and father, a brother of nine years and himself. Since the death of an older sister, he is the recipient of most of the unwise affection of his parents. His brother appears to bear him a grudge because of this favoritism, as might be expected. Peter hears continually, "Ben is so bad and so dumb, but Peter is so good and so smart!" His mother is a highly emotional individual who can not get through an interview, however brief, without a display of tears. She is totally incapable of providing a home on the \$25 a week which her husband steadily earns. In an attempt to control Peter she resorts to frequent fear suggestions. "Come in Peter, some one wants to steal you." To her erratic resorts to discipline, Peter reacts with temper tantrums. He was denied a summer in the country because his father "forgets he's tired when he has Peter around." Surely a discouraging outlook for Peter.

But the recent development of psychological studies of young children and the growing tendency to carry the knowledge gained in the psychological laboratories into the home and school induce us to predict a more wholesome treatment of a future generation of Peters.

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