THE CONDITIONED REFLEX AND EXPERIMENTAL NEUROSIS

"Without doubt, the outstanding finding in Pavlov's experiments on differentiation [discrimination] is the tremendous value of this inhibitory power in the life of a dog. Without his "braking power"[his ability to discriminate between one stimulus and another] the dog would be unable to choose or select [or adapt well to his world]. He would respond hit or miss to every stimulation, unimportant as well as important; in short, his existence would be a riotous confusion of events.

What happens when the dog loses his ability to discriminate is clearly shown in a case of "experimental neurosis" produced by Pavlov and his group in a dog. [Ms.?] Krestonikova, one of Pavlov's students, conditioned a dog so that saliva was secreted whenever a circle of light was thrown upon a dark screen. As in previous experiments, the CR [conditioned reflex] was built up by giving the dog food[the UCS] whenever the circle appeared[the CS] and continuing this combination, food plus circle, until at last saliva flowed to the circle alone[the learned CR]. Next the dog was shown a small ellipse again and again, no food ever being given along with it. Eventually, the point was reached when the saliva flowed at the sight of the circle, but never at the sight of the ellipse. To test the dog's differentiating ability, he was now shown larger and more circular ellipses, always without food, until finally he could distinguish--as shown by the appearance of the reflex--between the circle and an ellipse whose axes were in the relation 7:8. This would seem to have been a sufficient feat in itself, but the experimenter was not yet satisfied, and attempted to have her dog distinguish between the circle and an ellipse whose axes were as 8:9--a figure scarcely different from a perfect circle. This task proved to be too much for the dog's inhibitory ability [i.e., his ability to discriminate, he lost it]. Saliva flowed first at sight of the ellipse, then at the circle, then at sight of either or both without any distinction. *The dog began to whine, barked fiercely at the screen, tore at his restraining apparatus with his teeth, and attempted to jump down from the table. After this experiment, the dog was useless as an experimental animal. Saliva would flow at the sight of the experimenter, or at the sight of the experiment room, or at almost any stimulus. Apparently what had happened was an almost complete collapse of the dog's differentiating ability due to too great of strain being placed upon the brake. When finally the brake gave way, response became general and riotous* [italics inserted].

Experimental neurosis had been produced in other animals, as well as in the dog. For example, nervous and disorganized behavior appeared in sheep when (1) the difference between positive and negative stimuli was *decreased* (as in Pavlov's experiment), and (2) when the *number* of presentations was increased (with shifts back and forth from the positive to the negative stimulus) without decreasing the difference between the stimuli. Electric shock was the unconditioned stimulus, and the "defense reaction"--withdrawal by flexion of the foreleg--the reflexive response. Neurotic behavior has also been produced experimentally by the conditioned reflex technique in pigs and in rats. Apparently, the essential element in such behavior when produced by the conditioned reflex method is the clash between mutually incompatible responses. Faced by a dilemma, the animal either reacts violently and without discrimination, or refuses to act at all.

A loss of discriminative ability in human beings, as in animals, is often associated with nervous diseases or neurosis [today known as anxiety disorders of one sort or another]. The neurotic individual cannot discriminate between really dangerous and really harmless objects [as would be the case with a person with a phobia… an irrational fear]. Hence he is afraid of cats or dark rooms or crossing bridges or of a thousand and one other things intrinsically harmless. Nor can he choose between really important and really unimportant tasks, and so he is impelled to perform useless acts such as washing his hands ten times a day, touching every other lamp post, going up the stairs two steps at a time, and the like [as in obsessive compulsive disorder]. Possibly a considerable share of the fatigue characteristic of neurasthenia [literally nerve weakness] comes from the large amount of lost motion indulged in.

To be sure, even in normals, conflict and confusion (neurosis) may arise if undue strain is placed upon the discriminatory ability. A little child is allowed to shout and play roughly at one time (is even encouraged and laughed at) and is punished for doing the same thing on another occasion because mother is tired or "company" is present. Again a child is punished for "lying" but hears his mother tell "social lies" over the phone--say she's ill or not home and hence is unable to see an unwanted caller. Many children cannot see the difference between behavior (ostensibly the same), which is sometimes right, and sometimes wrong. Unable to fathom such inconsistencies, they are faced by a dilemma as real as that which confronted Pavlov's dog when it was unable to distinguish the ellipse from the circle.

Conflicts due to the interference of competing stimuli often arise in the classroom. Teaching a child French and Spanish at the same time, or alternative methods of subtracting or dividing, and for a time at least efficiency in both tasks will be impaired. Although relatively mild, such conflicts are emotionally disturbing and are destructive of morale. Intelligent behavior in the child depends upon a judicious choice and selection from among the many competing stimuli which assail his sense organs. It is the task of the teacher to emphasize those stimuli to which responses should be made, and to prevent needless and wasteful conflicts whenever possible." [1]

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[1] Garrett, Henry E. *Great experiments in psychology*. New York: Appleton-Century Company, 1941, pp. 139-141. Comments in [ ] added by Anthony A. Walsh, Ph.D., March 29, 2003.