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Effect of Electric Convulsive Therapy on Memory.

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Electric shock therapy is one of the therapies that is being used currently in the treatment of mental disease. The technic utilized at the New York State Psychiatric Institute has been described¹ and the exact procedure together with the clinically observed sequelae were carefully noted. One of the most striking psychological concomitants of this treatment is the characteristic impairment of the patient’s memory.

In order to obtain objective evidence of the degree of memory impairment, it was determined to teach 10 patients a series of tasks before treatment and note the influence of the treatment on the retention of this material.

The materials used in this experiment were paired word associates composed of common household commodities like sugar or coffee paired with pseudo-brand names consisting of two-syllabled nonsense material.

A week before treatment was begun the patient was given a control series consisting of a learning session in the morning followed by a retention test in the afternoon. The criterion of success was 2 consecutive correct repetitions. During the shock week the same procedure was followed on the shock days (Monday, Wednesday and Friday) as well as on the alternate non-shock days. At the end of the course of treatment, several of the patients were given a post-treatment series of tests.

Results. The effect of shock on memory was analyzed in ac-

cordance with the 3 methods available for testing retention: re-
learning, recall and recognition. The data for each patient were
analyzed separately and after the consistency of the individual results
was established they were combined. When no shock intervenes
between learning and relearning, the number of trials saved is sig-
nificant when compared to its standard error. However, when a
shock is interpolated between learning and relearning, there is no
significant saving, and indeed there is a slight, but non-significant
loss. It should be noted, however, that learning ability is no poorer
after shock than before shock.

The first trial in each relearning series was regarded as the recall
trial, and the number of correctly recalled items in that trial
constituted the recall score. The recall after shock was significantly
less than the recall after the control and non-shock periods. It is
interesting to note that the highest recall is shown in the post-treat-
ment testing.

In addition to the evidence of memory impairment given by the
saving and recall methods, the recognition method also yielded an
index of memory loss. The afternoon before each shock day a series
of paired associates was taught and in the morning immediately
before shock, another series of paired associates was taught in
which the commodities were identical with those taught the pre-
vious night. There were thus, two associates to each commodity,
a "remote" one, learned the night before and a "recent" one,
learned immediately before shock. After shock, when the patient
had regained his composure, a recognition test was given to the
patient. This test consisted of the commodity name followed by 4
choices, 2 of which were the learned brand names.

Under control conditions, the patients were able to recognize
correctly both paired associates ("recent" and "remote") nearly
94% of the time. Under shock conditions, this percent dropped to
81.5. This represents a drop of 12.5 points which is found to be
statistically significant. It should be noted, however, that shock
interferes only slightly with recognition, for the post-shock recogni-
tion is 87% as strong as the post-control recognition. The recogni-
tion under non-shock conditions is very similar to the performance
under shock conditions. It should be noted that even under shock
conditions the performance is significantly greater than chance. This
holds true not only of the group results, but also of the results for
each individual.

It is interesting to note that under control conditions "recent"
learning is stronger than "remote" learning for, in 5.8% of the
items the recent associate was recognized while the remote associate failed to be recognized. Under shock conditions, the differential between "recent" and "remote" learning disappears, as shown by the fact that the proportions in the "recent only" and "remote only" categories are about the same. Apparently the shock affects the learning acquired immediately before shock more than the learning acquired less recently before shock.