

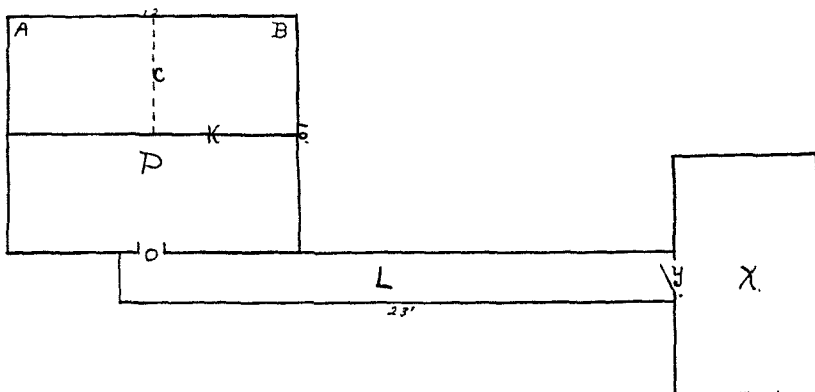
THE IMPORTANCE OF PRIMACY IN THE LEARNING OF A PIG

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During the summer of 1911 the writer performed some experiments on an eight-week old pig. While there are many obvious imperfections in the experiments the records emphasize an important aspect in the learning process, namely, the tendency of the first of a series of habits to possess a relatively high persistency.

The apparatus was very simple. When not fed the pig was shut in a pen X from which a door Y led into a lane L 23 feet in length. Near the end of the lane was an opening O which led into the general pen P whose measurements were 10 x 12 feet. Five feet from either side of P was a board K 7 inches high, parallel to the lane. This board was so high that the pig could not naturally see over it. In either of the corners of P farthest from O and equally distant from it was placed a food receptacle which could be transferred from one corner (A) to the other corner (B).



In the first instance the pig was released at Y and found his way into A where he soon found the food, morning noon, and

evening of the first day. On the second and third feedings he ran directly to A without hesitancy. Each time, as soon as his meal had ended, he was shut up in X.

The food always was put into the receptacle before the pig was released so that he could not see it until he had crossed K.

Second Day

Fed every 2 hours. Food was put regularly into B.

First feeding. When released the pig ran directly to A as on the first day, not finding food he rambled about much disturbed for several minutes. Finally he ran a little farther to the right than before and found the food at B.

Second feeding. The same procedure as in the first, but in about half the time.

Third feeding. He ran as before, directly into A; then immediately to B.

Fourth feeding. Same as third feeding, but in less time. Each time when he had consumed the food at B he would return to A looking for food there. He was never fed to satiety.

Fifth feeding. Before he was released, a partition C, 8 inches high was placed mid-way between the two feeding places. He entered the A side directly then, with almost no hesitancy, jumped over the partition toward B. There he was so disturbed he did not get the food at B but jumped out over K. After a number of quick false movements he jumped back over K to B and ate the food. There was no more running to A after the food was eaten.

Sixth feeding. Jumped directly into the A side, came out over K and with no false moves turned to the right and jumped over K to B.

Seventh feeding. Same as sixth.

Third Day (Still fed at B)

First feeding. He made a bee-line from O to A, back over K, to the right, and to B over K.

Second feeding. He made a bee-line for A but only raised his head and looked over K, paused a few moments, turned and jumped over K near partition, into B side.

Third, fourth, and fifth feedings. Made a bee-line from O to B.

Fourth Day

He was fed only three times, morning, noon and evening, when he always made a bee-line from O to B.

Fifth Day (Feeding place changed to A)

First feeding. He made a bee-line for B, searched for food with restless movements, jumped out over K, then scarcely moving to left at all, jumped over K to A.

Second feeding. He jumped into B, then with practically no pause, over partition to A.

Third feeding. Started for B side, but looked over, paused, then into A. In going to B side, however, his pathway diverged a little toward the partition, a decided modification of old pathway from O to B side.

Fourth feeding. Same as third but divergence greater, i. e., nearer partition.

Fifth feeding. He ran directly toward A side but very close to partition, paused without looking over, and jumped directly into A side.

Sixth and Seventh feedings. Made a bee-line to A.

Sixth Day (Feeding place changed to B)

First feeding. He made a bee-line to A but jumped over partition quickly to B, as if planned, with no appreciable pause. Now another board of 6 inches was added to partition C, making it 14 inches high.

Second feeding. He made a bee-line to A but this time he came out of A over K, then to right into B side.

Third and fourth feedings. Same as second.

Fifth feeding. In bee-line to A side but near partition looked over, then turned and jumped into B.

Sixth feeding. He ran directly into B side, but near partition. No pause.

Seventh Day (Morning. Feeding place changed to A)

First feeding. He ran in a bee-line into B out over K, and into A.

Second feeding. He ran directly to B side near partition looked over and very quickly jumped into A.

Third feeding. Bee-line to A.

Seventh Day (Afternoon. Feeding place changed to B)

First feeding. He ran directly to A looked over cautiously, then jumped into B.

Second feeding. He ran to B side, near partition, looked over and jumped into B side.

Third feeding. Directly over B side near partition.

Fourth and fifth feeding. Same as third.

Sixth and Seventh feedings. Bee-line from O to B.

Eighth Day (Morning. Feeding place changed to A)

First feeding. In bee-line toward B, looked over K, and put fore feet over K, then drew back and jumped into A.

Second, third, fourth, and fifth feedings. Bee-line from O to A.

Eighth Day (Afternoon. Feeding place changed to B)

First feeding. Bee-line for A, quickly out and into B.

Second feeding. Directly to A side, looked over, then into B.

Third feeding. Same as second.

Fourth feeding. Directly to B side near partition and into B.

Fifth feeding. Bee-line from O into B.

The following figures show the number of times the pig was fed A and B respectively and the number of right and wrong trips to each.

	No. times fed in A	Wrong trips to A	No. times fed in B	Wrong trips to B
First Day.....	3	0	0	0
Second Day.....	0	7	7	0
Third Day.....	0	2	5	0
Fourth Day.....	0	0	3	0
Fifth Day.....	7	0	0	4
Sixth Day.....	0	5	6	0
Seventh Day (Morning).....	3	0	0	2
Seventh Day (Afternoon).....	0	1	7	0
Eighth Day (Morning).....	5	0	0	1
Eighth Day (Afternoon).....	0	3	5	0
	18	18	33	7

While in all, the pig was fed 18 times in A and 33 times in B, he wrongly entered B (i. e. when the food was placed in A), 7 times and wrongly entered A 18 times or, 33.3 per cent. and 54.5 per cent of the responses, respectively, were wrong.

It took only the first feeding to establish a direct pathway from O to A, but after two repetitions of this trip it took ten

trials before the subject learned to go directly from O to B. After going directly to B three successive times it took only five trials to learn to go directly from O to A again. To make the next transition of the pathway (from OA to OB) it took six trials. Hence, while primacy tends to persist throughout it decreases somewhat with time.

The modification in the learning is worthy of note. The excited, random movements so obvious in the earlier new situations which successively appeared with the alternation of feeding places, decreased as the experiment progressed. On the other hand the responses to the later situations were characterized by hesitancy and by attempts to use the eyes to help determine, before jumping over the board K, which was the right way to go. To illustrate, on the twelfth feeding which was the second feeding of the third day, after having gone from A to B eight successive times, he paused at K at a point on a straight pathway to A from O, raised his head high enough to look over K, then turned and jumped over K near the partition into the B side. Likewise at the third and fourth feeding of the fifth day, after making two wrong trips to B, he paused at K, looked over and turned and jumped into A. His pathway, moreover, instead of being in a straight line from O to B diverged a little toward the partition, and on the succeeding trip diverged still more, so that the next time he jumped directly into the A side but near the partition. At the fifth feeding of this same day, instead of looking over K, he ran to it in line with A, paused, and jumped into the A side. These gradually shifting pathways seem to indicate the resultant of two antagonistic impulses. It must be remembered here that although the subject often took the wrong pathway from O, eventually he always found the food; but in finding the food after first entering the wrong side the subject never went back to O for a new start, but sought the food by the shortest way he could find from where he was. No doubt the transitions from one pathway to another, from O, could have been completed with fewer errors if the corrections could have been made from O. Even then, theoretically, there would have been some tendency to make the wrong trip again and to return to O rather than to go to the food directly. In any event, the mere recency of the appeal of the stimulus where it once was, does not so much account for the tendency to con-

tinue to take the wrong pathway as the persistency of the impulse to go from O by the pathway that last was successful from O to the food. It is interesting to note that the pathway taken at the first feeding of each morning was always the same as the pathway taken last on the previous day.

An example from the writer's experience of an attempt to break a certain habit of forgetting may help explain the principle involved. On two successive evenings he forgot to extinguish the gas light in the cellar after he had made the fire. On the third evening as he closed the cellar door behind him, on entering the kitchen he remembered that he had left the light burning and he at once returned to extinguish it. For about a score of evenings he went through exactly the same process of forgetting and correcting. Just as soon as the thought of the light suggested itself when the fires had been made, the proper reaction to the light was elicited. Again, it is not so much the attraction of a stimulus that determines a certain reaction as it is the precedence and strength of that reaction to that stimulus.

The results of this experiment are significant in showing the tremendous force and persistency of the first of a series of habits. Of course humans are not pigs but fundamentally the methods of learning for pigs and people are about the same. Therefore, these records suggest the gravity of the "first impression," and emphasize the importance of correct reactions at the outset in any kind of learning.

It is to be regretted that the time for each reaction was not recorded and that some device was not provided whereby the exact part of K over which the pig jumped in his search or the food could be determined, and that the experiment was not continued for a much longer time. While these results are not at all conclusive they probably suffice to warrant further study along the same lines on small children as well as on animals.