with a simple avoidance task nor with a simple black-white discrimination, suggesting that whatever underlies the improvement in acquisition must have to do with the complex analysis involved in pattern discrimination. It is, therefore, paradoxical that facilitation did not occur when the pattern discrimination was learned after the black-white discrimination, for this should be the purest case of specific pattern-discrimination learning. Two hypotheses could account for this finding. First, it might be that "general" learning (as we have described it earlier) somehow interacts with the mechanism of pattern analysis in producing the enhancement effect. If, for example, the lesion improved the saliency of pattern cues, the S might find it easier to abandon incorrect hypotheses, such as position hypotheses, that normally slow pattern acquisition. When pattern training followed black-white training, position hypotheses would already have been eliminated, so lesion-induced saliency of cues might be of little or no value. The second hypothesis stems from the finding that no marked tendency toward enhancement with striate ablation occurred during second-problem acquisition. The second problem is learned so quickly that it might well be difficult to improve on those performances. It would not be unreasonable to suppose that similar considerations apply to the black-white problem, since black-white discriminations are commonly more easily acquired than are pattern discriminations. However, black-white was acquired no more quickly than was the horizontal-vertical task in the present experiment.

The finding of powerful interproblem facilitation between the two types of problems confirms the earlier finding of Levinson & Sheridan (1967), that these discrimination tasks include, besides the aspects specific to the problem type, a general component that is found in both the black-white and the pattern problem. It would be interesting to know to what extent these two problem components react differently to various independent variables. In the present study, any enhancing effects of unilateral striate ablations would appear to be restricted to the specific component of the pattern problem, since the effects are restricted to the latter problem type. Nevertheless, the finding that enhancement failed to occur when the pattern problem was second, coupled with the assumption that second-problem learning is primarily specific-component learning, suggests that both general and specific components somehow interact in the production of such enhancement effects.

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The effect of a stranger's presence on the exploratory behavior of rats*

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A two-group randomized design was used to evaluate the exploration of a five-path elevated maze by 40 male rats in the presence of Ss' caretaker and in the presence of a stranger. Ss explored the maze more in the presence of the caretaker than in the presence of the stranger ($p < .01$). Further analysis indicated that Ss avoided the paths of the maze adjacent to the stranger ($p < .01$), but did not approach the paths adjacent to the caretaker ($p > .01$). The data suggest that the caretaker effect in rats is a function of the presence of a stranger, rather than the presence of S's caretaker, during exploration.

McCall, Lester, & Dolan (1969) reported that rats exploring a modified Hebb-Williams maze spent a greater proportion of the exploration time on the side of the maze adjacent to their caretaker than the side adjacent to a stranger. This effect was attributed to some undetermined characteristic of the caretaker. Further investigation by McCall, Lester, & Corter (1969) indicated that this "preference" for the area of the maze adjacent to the caretaker was mediated by olfactory but not visual cues.

In the McCall et al investigations, both the caretaker and the stranger were present during all exploration trials. Under those conditions it was impossible to determine whether it was the stranger's or the caretaker's presence that was influencing the rat's exploratory behavior. The present experiment was designed to determine if the caretaker effect described in the McCall et al investigations was caused by a tendency of the rats to approach the caretaker, avoid the stranger, or both.

SUBJECTS

The Ss were 40 male 70-day-old rats obtained from Holtzman. Upon receipt, Ss were housed four per cage and placed in an isolated room on ad lib food and water under a 12-h-on/12-h-off lighting schedule. The Ss were handled briefly by the caretaker when approximately 102 days old, but were not exposed to the experimental apparatus prior to testing at 120 days of age.

APPARATUS

The exploration apparatus consisted of a five-path elevated maze similar to that used by Lachman (1965). The five paths, each 1.5-m long and 6.6-cm wide were attached to five adjacent sides of an equilateral dodecagon 38.1 cm in diam.

Because rats tend to explore partially enclosed paths more than completely open paths (Lester, 1969), each path was converted into a tunnel approximately 7.6 cm wide and 22.8 cm high by enclosing the path with 1.2-cm mesh hardware cloth. A piece of wood, 30.4 cm high x 6.6 cm wide, was attached vertically to the end of each path, and guillotine doors were mounted 45.7 cm from the distal ends of the paths to prevent Ss from returning to the start area once a path had been explored.

The entire maze was elevated 91.41 cm above the floor and centered in an empty 5.48 x 2.89 m room located approximately 45 m from the animal colony. A lab stool was placed 76.20 cm from each side of the 12-sided start platform on an imaginary line passing through the center of the platform and running perpendicular to the center path. The room was illuminated by a 60-w red light bulb suspended 96.5 cm over the center of the elevated maze.

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Table 1
Scoring System for Exploration of Five-Path Maze

Number of Different Paths Chosen	Degree of Divergence																
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
0	0																
1	1																
2		2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
3			18	19	20	21	22	23	24	25	26	27	28	29	30	31	
4				32	33	34	35	36	37	38	39	40	41	42			
5					43	44	45	46	47	48	49	50					

Note–Exploration score values are given in the body of the table.

A small cage, used for holding Ss between "runs," was positioned behind the maze in one corner of the room. A top and bottomless opaque plastic waste container, measuring approximately 15.2 x 10.1 x 30.4 cm, was used as a startbox.

PROCEDURE

A two-group randomized design was used. In the caretaker-present treatment condition (CPTC), only the caretaker was present during the exploration test; in the stranger-present treatment condition (SPTC), only the stranger was present. The side of the maze from which the caretaker or stranger observed S's behavior was balanced across Ss, but held constant within Ss. Treatment conditions were administered in alternate order starting with the SPTC. The caretaker wore the same white lab coat worn while caring for the Ss, but the stranger wore a recently laundered white lab coat. All Ss were tested during the dark active portion of the light cycle.

The exploration test consisted of five separate "runs" for each S. A run started when S was released from the startbox on the starting platform, and ended when S's pinnae passed under one of the guillotine doors. The sequence of runs (i.e., the order of the five paths chosen for exploration during the test) was recorded. The path closest to the E was arbitrarily designated Path 1, while the path furthest away was designated Path 5.

In the SPTC, with the stranger seated on the appropriate stool, the caretaker removed S from the holding cage and placed S in the startbox on the starting platform. After the caretaker left the room, the stranger removed the startbox and placed it directly under the platform, then quietly observed S's behavior. At the end of the run, the stranger lowered the guillotine door thereby retaining S at the end of the path. The caretaker returned to the room, removed S from the path, and placed S in the holding cage. After the guillotine door had been reset, the urine and feces cleaned from the maze, and the startbox positioned on the start platform, the caretaker prepared for the next run by moving S from the holding cage to the startbox and leaving the room. The handling procedure under the CPTC was the same as in the SPTC.

Table 2
Percent of Times Each Path Was Chosen

Treatment Condition	Path 1	2	3	4	5
SPTC	2	15	18	36	29
CPTC	20	20	16	17	27

Note–Path 1 was the path closest to the caretaker and stranger. Path 5 was the furtherest away.

The scoring system used to evaluate exploration of the five-path maze took into consideration both the number of different paths explored by S and the degree of divergence (variability) exhibited in the sequence of paths chosen. Lachman (1965, 1966) has developed and described in detail a method of measuring the degree of divergence of any sequence of paths chosen on the five-path maze. To compute the degree of divergence for any sequence of paths chosen, the "spaces" between the successive choices are counted and summed. The sequence of choices (1-5-2-4-5), for example, has 10 deg of divergence: four between the first and second choice, three between the second and third choice, two between the third and fourth choice, and one between the fourth and fifth choice. This measure of exploration is probably not confounded with activity since it depends only on the number of different paths chosen and the degree of divergence exhibited in the choice sequence. The scoring system used to evaluate exploration in the present experiment is presented in Table 1.

RESULTS AND DISCUSSION

The mean exploration score under the CPTC of 30.4 was significantly greater than the mean exploration score of 17.6 under the SPTC ($t = 3.07$, $df = 38$, $p < .01$). The Ss explored the maze more in the presence of their caretaker than in the presence of a stranger. The percent of times each path was chosen is presented in Table 2.

In order to test the hypothesis that rats avoid being in close proximity to strangers, the mean of the path numbers chosen under the SPTC (3.75) was compared to the mean of the path numbers that would be expected if the paths had been chosen completely at random (3.0). The difference was significant ($t = 6.09$, $df = 19$, $p < .01$). The Ss tended to avoid the portion of the maze adjacent to a stranger.

To test the hypothesis that rats tend to approach their caretaker, the mean of the path numbers chosen under the CPTC (3.11) was compared to the mean expected on the basis of chance alone (3.0). The difference was not significant ($t = -.60$, $df = 19$, $p > .01$). The Ss did not choose the paths of the maze adjacent to the caretaker more than would be expected by chance.

It appears that the "caretaker effect" can be attributed almost entirely to the stranger, whose most obvious characteristic with respect to the Ss was that of being a novel stimulus. Montgomery (1955) reported that in some situations fear, as measured by avoidance behavior, may be elicited by a novel stimulus. Montgomery & Monkman (1955) found that fear produced by buzzer and shock stimulation during an exploration period reduced the amount of exploration observed during that period. It would seem that the caretaker effect reported in the McCall et al investigations may be explained in terms of a fear-eliciting novel stimulus present during exploration, i.e., the stranger.

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