CONFLICT AND THE "EXPERIMENTAL NEUROSES" OF CATS

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Major professor

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ABSTRACT

CONFLICT AND THE "EXPERIMENTAL NEUROSES" OF CATS

By

Victor Matthew Dmitruk

Eight groups of 7 cats, 4 groups under each of 2 food-deprivation/shock-intensity conditions (18 hrs deprived, 2.5 mA, and 42 hrs deprived, 4.0 mA) were run to evaluate (1) the phenomenon of "experimental neurosis" in cats, and (2) Masserman's contention that conflict is necessary for the development of the "neuroses."

Baseline measures of the behavior of the Ss were taken on 5 consecutive days to determine the "normal" activities of cats confined in a conditioning apparatus. This was done prior to any experimental manipulations. The baseline-measure (BLM) days were followed by 2-3 shock (SH) days.

Food was placed in the apparatus on the SH days for a group of conflict (CON) Ss in both the low-deprivation/low-shock (LL) and the high-deprivation/high-shock (HH) conditions, and the Ss were free to eat at will. They were, however, shocked each time they did so to create a conflict situation analogous to Masserman's. The time intervals separating successive shocks were recorded for each CON S.

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according to the same schedule as its CON mate, but was not exposed to food in the shock-chamber. Hence, there was no conflict. A non-conflict predictable littermate (NCP) was also shocked according to the pattern established by its CON mate, again in the absence of food. Shock was made "predictable" for these Ss, however, by preceding its onset with a 10 sec buzzer CS. Finally, a confinement (CNF) littermate simply spent an equivalent amount of time in the shock-chamber, being neither shocked nor fed.

It was hypothesized that the results would be explicable in terms of existing knowledge of the effects of punishment and non-contingent aversive stimulation. This meant that shock should have acted "selectively" on the response being punished (i.e., the consummatory response) in the CON Ss, resulting in the suppression of feeding, while leaving other behaviors relatively unaffected. Exposure to non-contingent aversive stimulation in the case of the NC and NCP Ss should have resulted in a more general decrease in all ongoing activity.

The groups were then compared on a number of measures considered to be indications of "neurosis" by previous investigators, including those specified by Masserman. These "symptoms" were observed from the first day of the BLM period and their incidenc

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and their incidence did not change in the CON Ss from the BLM to the SH days. In addition, the CON Ss which, according to Masserman, should have been "neurotic" did not differ from the CNF Ss on any of the measures taken.

The only significant differences observed in the activities of the groups were the result of decreases in the incidence of the "symptoms" in the NC and NCP Ss, as predicted. Thus, neurotic behaviors were not observed, and the effects of punishing the consummatory behavior of the CON Ss were consistent with the punishment literature and the hypotheses forwarded above. Food was introduced into the shock-chamber for all groups following the suppression of eating in the CON Ss and feeding latencies and the time required to ingest 60 gms of wet mash were recorded.

The CON Ss required significantly more time to begin eating than the remaining groups ($p. < .001$), which did not differ. This was not surprising, and is not necessarily "neurotic." First, the CON Ss learned to avoid food and, at most, this avoidance persisted for 3 days. This is not an inordinately long period for the retention of such a response. Secondly, feeding inhibitions were assumed to be an index of "fear." The CON Ss were exposed to food in the shock-chamber on each of the SH days, and introduction of a second container of food did not al

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of food did not alter the stimulus situation appreciably for these Ss. The Ss in the remaining groups had never experienced food in the shock-chamber and introduction of food constituted a significant stimulus change. Hence, greater stimulus generalization decrement would result in reduced fear and shorter feeding latencies in the NC, NCP, and CNF Ss.

It was concluded that cats do not become "neurotic" and suggested that Masserman's results could be explained as artifacts of the procedures he employed. Masserman's cats were first trained to operate a lever to obtain food. This training required more than 100 trials for some Ss. Selective reinforcement of this operant would result in the inhibition of behaviors unrelated to obtaining food, and these responses may have been subsequently disinhibited when shock was introduced to create a "motivational conflict."

Since Masserman took his baseline measures <u>after</u> his Ss had learned to operate the lever, he could have mistakenly identified these disinhibited "normal" reactions as indications of "neurosis." The present findings suggest that Masserman may have drawn different conclusions had he taken his baseline measures prior to the introduction of <u>any</u> experimental manipulations.

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The author wi

Ray Denny, Chairm

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The amount of interest displayed in the experimentally-induced "animal neuroses" has declined significantly in the past two decades. It appears, however, that these phenomena are little understood, and a great deal remains to be learned about the various "pathologies" of animals.

Although the initial observations of "abnormal" behavior in animals were reported by students in Pavlov's laboratory, the bulk of the experimental work in this area was conducted by American psychologists and physiologists. The results obtained in the early studies of Anderson and his associates (Anderson, 1939; Anderson and Liddell, 1935), Cook (1938, 1939c), Dimmick, et al. (1938), and Dworkin (1938) led to a great increase in the amount of research devoted to the investigation of a variety of phenomena conveniently subsumed under the rubric of "experimental neurosis."

This interest persisted throughout the 1940s, but began to wane considerably during the 1950s. Very little research is currently being conducted in this area, and papers pertaining to the "experimental neuroses" appear but infrequently in the professional literature.

The disturbances referred to collectively as the "experimental neuroses" are purportedly quite easily produced in a variety of organisms. "Neurotic" reactions have been reported in cats (Dimmick, et al., 1938; Dworkin, 1938; Karn, 1943;

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Masserman, 1943; Masserman and Yum, 1946; Smart, 1965; Wolpe, 1952), dogs (Anderson and Parmenter, 1941; Dworkin, 1938; Gantt, 1944; James, 1943), sheep (Anderson, 1939; Anderson and Parmenter, 1941; Liddell, et al., 1936), goats (Liddell, 1942), pigs (Curtis, 1937), monkeys (Masserman and Pechtel, 1953a, 1953b), and in children (Darrow, 1953). Apparently analogous behaviors have even been attributed to the ant by Hoagland (1953).

A substantial number of reports also suggest that "neurotic" reactions are common in rats (Gentry and Dunlap, 1942; Humphrey and Marcuse, 1939; Maier, 1940, 1944, 1948). It appears, however, that the abnormalities manifested by the rat (e.g., audiogenic seizures, position fixations) differ qualitatively from those considered "neurotic" in other species.

The behaviors identified as "neurotic" have been discussed by Gantt (1944), Cook (1939a), Masserman (1943), and Lubin (1943). Gantt (1944) suggested that all of the reactions of dogs in situations designed to produce "neurosis" can be placed into four broad categories. Certain of these reactions were considered "normal," while others were not. The categories specified by Gantt were

1. Active-defensive reactions. These reactions are not "neurotic" and involve attempts to escape from the experimental situation.

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2. Passive-defensive reactions. These responses are maladaptive, involving chronic immobility and a variety of motor disturbances.

3. "Neurotic" reactions. The descriptions provided by Gantt of the behaviors to be included in this category were vague, at best. He simply stated that they consist of "entirely unrelated and extraneous symptoms." They do not resemble appropriate responses in any way, nor do they possess any active or passive defensive value.

4. "Occult" physiological reactions. These consist of autonomic reactions which "are not directly observable." Gantt's description of these reactions was also vague, and they are difficult to specify.

Masserman (1943) also identified four types of reaction to his experimental procedures. Working with cats, Masserman reported

1. Characteristic changes in spontaneous activity. Normally active subjects became hypoactive, while normally inactive subjects became hyperactive.

2. "Phobic" reactions. Certain stimuli came to elicit behavior "suggestive of extreme anxiety."

3. "Bizarre counterphobic" reactions. Subjects placed in conflictual situations developed stereotyped modes of responding (e.g., pacing, rubbing, pawing). Masserman concluded that these behaviors, "...while biologically frustraneous.../constituted/...defensive adaptations to contrary motivations" (1943, p. 69).

4. "Regressive substitutive" behaviors. These behaviors were characterized by "...fairly well-marked tendencies to preoccupation and autistic indulgence." Masserman was apparently suggesting that these behaviors were some sort of "displacement" activity which functioned as "...substitutive satisfaction for drives rendered impossible of direct consummation" (1943, p. 69).

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a review of the literature dealing with the "neuroses" of several species. The "symptoms" mentioned were

1. Loss of a previously acquired habit. CSs which previously elicited a response lost their effectiveness. The magnitude of this effect was reported to be a function of the initial strength of the response.[1]

2. Disinhibition. Negative stimuli which were previously highly effective in inhibiting a response lost their effectiveness.

3. Impairment of learning ability. Many subjects were reported to lose the ability to reacquire the responses in 1 and 2 above. The learning ability of the subjects was somehow impaired by the experimental procedures to which they were exposed.

4. Changes in general activity. This category included such things as "tension," restlessness, hypoactivity and hyperactivity.

Lubin (1943) provided the most comprehensive summary of the characteristics of "neurotic" animals. Those he identified were

1. Hyperirritability. This included over-reaction to stimulation and restlessness of a chronic nature during experimentation.

2. Inhibitory reactions. These were characterized as some form of "catatonia."

3. Transfer of motor reactions. Patterns of motor behavior were "transferred" from one part of the subject's body to another. This was suggested to be analogous to the "transfer of neurotic pains" in humans.

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[1] It is interesting to note that this is what occurs in punishment situations. Reactions to the CS are suppressed and suppression is, in part, a function of the strength of the response (Church, 1963, 1969; Estes, 1944, 1969).

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4. Disturbances in respiratory rhythms.

5. Disturbances in diurnal neuromuscular activity. This was characterized primarily by insomnia.

6. Retention of urine and feces. Urine and feces were retained for the duration of the experiment and evacuation was frequent and uneven thereafter.

7. Disturbances of cardiac rate and rhythm.

8. Inappropriate and erratic social and emotional behavior.

Thus, a wide array of "symptoms" has been reported, and the validity of referring to these behaviors as "neurotic" seems questionable.

Animals are "neurotic," for example, if they are hyperactive. They are also "neurotic" if they are hypoactive. They are "neurotic" if they retain their urine and feces. They are also "neurotic" if they urinate and defecate in the experimental setting. More will be said of these "symptoms" below, but first an analysis of the conditions leading to their development appears to be in order.

Summaries of the procedures reported to lead to "neurotic" behavior have been provided by Pavlov (reported in Gantt, 1944), Gantt (1944), and Cook (1939a). Only the latter will be discussed, however, as Cook incorporated many of the views of Pavlov and Gantt into his summary. The experimental conditions specified by Cook included:

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behavior resulted in situations demanding new learning which inhibited, or was incompatible with, strong innate reactions. This is essentially a "conflict" situation best exemplified by Masserman's (1943) procedures, to be discussed in detail below.

2. Presentation of similar CSs which elicit mutually-exclusive responses. This was the procedure typically followed in Pavlov's laboratory. Pavlov's subjects were differentially conditioned to a distinctive CS+ and CS-. The CS- was then changed in the direction of the CS+ and his subjects (dogs) were reported to become "neurotic" when they could no longer discriminate between the two stimuli.

3. Rapid transition from one CS to another. This results in "neurosis" if the organism has been trained to emit antagonistic responses to the two CSs. In Cook's words, "...the reinforcement of a stimulus which previously had an inhibitory effect..." will result in neurosis.[2]

4. Delay of reinforcement. It was suggested that delay of reinforcement results in "neurotic" behavior in both classical and instrumental learning situations.[3]

5. Presentation of highly aversive stimuli.

6. Presentation of "novel" stimuli.[4]

Clearly, a variety of procedures have been employed in

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[2] This appears to be a simple discrimination-reversal procedure, and it is certain that many animals have managed such reversals without becoming "neurotic."

[3] There is a good deal of current interest in the effects of delay of reinforcement, but contemporary workers discuss reactions to delay in different terms. Amsel (1971) and Wagner (1969), for example, consider these responses "normal" reactions to "frustration" (i.e., frustrative nonreward).

[4] Cook was the only worker to suggest stimulus novelty as a cause of the "experimental neuroses," and the suggestion appears to have been of a purely speculative nature. No evidence was provided for this contention, and supporting studies have yet to be conducted.

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attempts to develop "neurotic" behavior in animals. Certain of these procedures involve common laboratory practices which, in the majority of instances, have not been reported to lead to "neurosis" (e.g., punishment, discrimination-reversal, delay of reinforcement).

This makes the interpretation of the literature dealing with the animal "neuroses" a difficult task. This, in turn, makes it difficult to evaluate the validity of the phenomenon. As the procedures used with a given species differ greatly, caution must be exercised in concluding that the resulting "symptoms" have anything in common, other than the fact that they are all labelled "neurotic."

Karn (1943), for example, claimed that he made cats "neurotic" by exposing them to a difficult alternation problem. Masserman (1943) made his cats "neurotic" by training them to perform a simple operant on signal to obtain food and then shocking them while eating. Dworkin (1939) reported that his cats were made "neurotic" by demanding they make a very fine pitch discrimination in a differential conditioning situation. It is difficult to see how common mechanisms, leading to similar reactions, could be operating in these situations. The problem is compounded when comparisons of the "neurotic" behavior of different species are attempted.

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evaluate the validity of the "neuroses." The typical experiment places the subject is a highly contrived situation. Cook (1939c), for example, compressed his rats between two pieces of foam rubber, and James (1943) attached heavy lead weights to the forelimbs of his dogs. What are the "normal" behaviors of rats and dogs in these situations?

In order to specify what is "neurotic" in animals, one should first determine the characteristic activities of the species under investigation. Most of the studies reported in the literature do not provide useful baseline data gathered prior to training for purposes of comparison. It is as though anything the animal does in a situation designed to produce "neurosis" is, by definition, "neurotic."

For these, and perhaps for other reasons as well, the "neurosis" literature has not been found wanting for critics. Finger (1945), for example, suggested that much of the work was conducted by

> "...investigators.../who/...simply applied the observational techniques of the psychopathologist to the study of animal behavior" (p. 231).

As a result, Finger found objectivity in this area of research to be "seriously lacking."

Mowrer (1950) was even more critical in remarking that "...it has appeared that the capacity for self-mysticism on the part of the experimenter was the principle desideratum for those working

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for those working with the animal neuroses" (p. 510). Similarly, Waters, _et al_. (1960) evaluated the work by suggesting that

> Our interest in the experimental neurosis has been derived in part from its relevance to an extremely serious social problem, the problem of how to deal with the ineffective and socially harmful behavior of the human patient. But it seems also to be derived in part from a rather childish and irresponsible delight in the bizarre and the mysterious. This delight may loom so large in our thinking as to convince us that any and all behavior that we do not understand is neurotic behavior (p. 300).

Thus, all are not convinced of the existence of "neurotic" behavior in animals.

The intent of the present investigation was to determine the presence or absence of "neurotic" behavior in cats. It was also intended to evaluate (1) the validity of the procedures employed by Masserman (1943) for the development of "neurosis" in these animals, and (2) the theoretical formulations forwarded in explaining his results.

Although Masserman's work represents but a small proportion of that available in the literature, it is significant in several respects. First, the work is limited in that data were not reported for the necessary control groups (Wolpe, 1952) even though they were run (Masserman, 1943). Secondly, this limitation not-withstanding, the results of Masserman's studies are frequently quoted by the dynamically-oriented in mustering support for "conflict" interpretations of neurosis in hu

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Masserman (1943) specified conflict as the most important causal factor in the development of animal "neurosis." Similar interpretations of these phenomena have been made by a number of other workers (Dworkin, 1939; Russell, 1950), and Bitterman (1946) concluded that

> It is probably true that all situations in which abnormal behavior has been observed in animals may be interpreted as conflictual...antagonistic adjustments are required of the animal simultaneously, or in rapid succession (p. 116).

A fine example of the reactions to such interpretations of the "neuroses" is provided in the following statement made by T. M. French, then President of the American Psychiatric Association:

> *We now see a beautiful proof of what we already expected*; that these experimental neuroses are the result of conflict, just as our clinical neuroses are (The Milbank Memorial Fund, 27th Annual Conference, 1953, p. 515, italics mine).

The widespread acceptance of conflict interpretations of the animal "neuroses" is probably one of the factors contributing to the current lack of interest in this area of research. This is unfortunate, since Masserman's (1943) work, the basis of most such interpretations, appears to be in need of re-evaluation (Smart, 1965; Wolpe, 1952). That his interpretation of the "experimental neuroses" is viable today, however, is evidenced by Masserman's (1967) recent contribution to t

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contribution to the literature, and a number of current references to his work (Manning, 1970; Sarason, 1972).

Masserman (1943) employed essentially the same technique in all of his work. His cats were food-deprived and trained to make a lever-pressing response on signal to gain access to the contents of a food box. The time required for this training typically ranged from 1-8 days. After the animals were trained to open the food box, electric foot-shock, an air-blast to the head, or a combination of these stimuli was delivered while they were eating.

Masserman (1943; Masserman and Yum, 1946) reported that these stimuli were equally effective in inhibiting the feeding response and precipitating the "neurotic" behaviors observed (the "symptoms" identified by Masserman were discussed on p. 4). 2-3 exposures to the aversive stimulus were typically sufficient to establish a "neurosis."

Masserman (1943) reported that mere exposure to aversive stimulation in the absence of "conflict" was not sufficient to precipitate a "neurosis." Subjects given the same number of shocks while engaged in activities other than eating did not become "neurotic." Masserman concluded, therefore, that an approach-avoidance conflict situation is prerequisite to the development of "experimental neurosis" in cats.

Wolpe (1952) challenged Masserman's interpretation of his data, pointir

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his data, pointing out that Masserman did not present any evidence to support the statement that non-contingent aversive stimulation does not result in "neurosis." Wolpe (1952) replicated Masserman's conflict (CON) condition and added a non-conflict (NC) group which was never fed in the conditioning apparatus. The NC animals were exposed to unsignalled shocks on a variable schedule, and the presentation of the shocks was independent of the behavior of these subjects.

Wolpe then tested his subjects using measures similar to those employed by Masserman (1943; Masserman and Yum, 1946) and found the incidence of "neurotic symptoms" to be the same in both groups. He also measured the extent to which the "neurotic" behaviors generalized to situations outside of the experimental setting. Once again, Wolpe found that the two groups did not differ. On the basis of these data, Wolpe concluded that Masserman's position was incorrect, and that conflict was not an essential condition for the development of "neurosis" in cats.

Unfortunately, Wolpe's (1952) procedures and conclusions were also open to question (Smart, 1965), and the issue of the relationship of conflict to the development of "neurosis" was not resolved. For a reason not specified, Wolpe's CON and NC subjects were not given the same number of shocks. The CON subjects received 2-9 shocks (though typically 2-3), while the NC sub

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while the NC subjects were exposed to 5-20 shocks. The CON and NC groups in Wolpe's study cannot be readily compared as the result of this discrepancy.

It is also difficult to compare Wolpe's (1952) results with those of Masserman (1943) as neither worker adequately specified the characteristics of the aversive stimuli employed. Masserman simply indicated that the shock source for his work was a "commercial fence-shocker." Wolpe was equally vague, stating that "...the current, being of high voltage but low amperage, was very uncomfortable to the human hand, but not conducive of tissue damage" (1952, p. 121). Wolpe's shock source was an induction coil.[5]

The most recent attempt to settle the conflict issue was made by Smart (1965). Recognizing the difficulties inherent in the work of Masserman (1943) and Wolpe (1952), Smart equated the number and the temporal distribution of the shocks he administered to three groups of subject (conflict-consummatory (CON), conflict-preconsummatory (CONP), and non-conflict (NC). Thirty subjects were randomly assigned to these groups and all were trained to operate a lever on signal to obtain food from a food box.

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[5] Seward (1969) suggested that the use of very intense aversive stimuli may result in a ceiling effect, disguising any differences which might otherwise be found between CON and NC subjects with lower shock intensities.

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Following lever-training, the subjects were given 4 shock sessions on consecutive days. 40 trials were run on each shock day, and shock was administered on 8 of the trials. The subjects were allowed to eat unmolested on the remaining 32 trials.

The animals were run in 10 "replications" of 3 subjects each. A replication consisted of 1 subject randomly selected from each of the 3 experimental groups. The trials on which shock was delivered were chosen randomly on each shock day, and the subjects in a given replication received the same number of shocks each day, on the same trials.

The CONP subject in a replication was run first and the number of shocks it received determined the number to which the remaining subjects in that replication would be exposed. The number of shocks the subjects in the various replications received ranged from 3-7, with a mean of 5.2. The shock intensity specified was 3.5 mA.

The CONP subjects were shocked as they approached the food, but prior to eating. The subjects in the CON group were shocked 1 sec after they began eating, and the NC subjects were not shocked within 30 sec of eating on a given trial.

Smart (1965) hypothesized that the major determinants of "neurotic" behavior were the conditioned aversive stimuli developing in the

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Of 48 intergroup comparisons made, the 3 groups of subjects were found to differ on only 2 measures ("Reaction to feeding signal," and "Attraction to caged mice"). These results were consistent with Smart's hypothesis. As the groups did not differ on any of the remaining measures, Smart concluded that the 3 groups of subjects became equally neurotic, and that conflict was not necessary for the development of "neurosis" in cats.

Smart's (1965) conclusions are interesting in several respects. First, he did not question the validity of the phenomenon that he was investigating, though several previous workers had (Finger, 1945; Mowrer, 1950; Waters, et al., 1960). An equally valid (and certainly more parsimonious) conclusion derived on the basis of Smart's data is that none of his subjects became "neurotic." Also, although he did find 2 differences consistent with his hypothesis, one might expect to find 1-2 differences on the basis of chance when making 48 comparisons.

Smart's work is also of interest in that it provides excellent support for the position he was attacking.

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Bitterman (1946) concluded that all instances of "neurotic" behavior reported in the literature developed in situations of a conflictual nature; situations in which "...antagonistic adjustments are required of the animal simultaneously, or in rapid succession" (p. 116).

It is difficult to see how Smart's NC condition differs in any essential way from Bitterman's description of situations which are conflictual. The intermingling of shock and feeding trials demanded "antagonistic adjustments" on the part of the NC subjects "in rapid succession." The restriction that shock not be administered within 30 sec of feeding certainly did not remove the element of conflict from the situation.

For example, the NC subjects were given unsignalled shocks, and one would expect this procedure to lead to the development of a conditioned emotional response (CER) to the situational cues.[6] The CER elicited by these cues would be present when food was made available to the NC subjects, resulting in conflict. At any rate, the position could be successfully defended that Smart actually ran 3 <u>conflict</u> groups of subjects, and one might be forced to conclude on the basis of his data that conflict <u>is</u> the critical factor

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[6] McAlister and McAlister (1971) emphasized the importance of situational cues as CSs for this type of conditioning in a recent review of the CER literature.

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Clearly, the question of the relationship of conflict to the development of the animal "neuroses" has not been resolved. Doubt also remains with respect to the very existence of the phenomenon. The present investigation was directed to both of these questions.

It seems that the only logical way to seperate the influence of conflict from the influence of mere exposure to aversive events is to assess the incidence of "neurotic" behavior in both conflict and non-conflict situations. In addition, a truly "non-conflict" situation can only be created by the removal of one of the "antagonistic response tendencies" referred to by Bitterman (1946). This can be accomplished by observing the incidence of "neurotic" behavior in subjects that are shocked, but never fed, in the experimental situation.

To evaluate the validity of the phenomenon itself, it is necessary to have some conception of the "normal" activities of the subjects prior to the introduction of <u>any</u> experimental manipulations. Masserman (1943), Smart (1965), and Wolpe (1952), for example, took certain measures for purposes of comparison following lever-training for food reward. It is possible that the responses emitted by cats in situations in which they are being rewarded for a single operant are not representati

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not representative of their customary behavioral repertoire. That is, non-reinforced responses would tend to be inhibited in the course of lever training. These responses may have increased in frequency once again following the suppression of feeding, and Masserman (1943), Smart (1965) and Wolpe (1952) could have mistaken these "normal" reactions for "neurosis."

Both of these considerations entered into the design of the present investigation. The element of conflict was removed by exposing animals to shock in a situation in which they had never been fed. The incidence of "neurotic" activity in these subjects was then compared with the incidence of "neurosis" in subjects given the same number and temporal distribution of shocks while eating.

Two groups of subjects were run in addition to the conflict (CON) and non-conflict (NC) groups. Seligman (1968) found that the "predictability" and "control" of shock were important determinants of the reactions of rats and dogs to aversive stimulation. Animals exposed to unpredictable and uncontrollable shocks became chronically emotional and, in the case of rats, developed gastric lesions. These reactions were not observed if the shock was made predictable and/or controllable.

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The third group of subjects was also a non-conflict group as they were never exposed to food in the experimental situation. However, the shock was made "predictable" for these subjects by preceding its onset with a 10 sec buzzer CS. Thus, the CON group was exposed to predictable/controllable shock, the NC group to unpredictable/uncontrollable shock, and the non-conflict predictable (NCP) group was exposed to predictable/uncontrollable shock.[7]

The fourth group of subjects was a confinement (CNF) control suggested by the intensely negative reactions to confinement observed in the course of pilot work. Confinement appears to be highly aversive to cats, but it has not been included as a control in previous investigations. This is surprising as it appears to be the only factor most studies have in common, and several investigators have suggested that confinement and restriction of motor activity might be related to the development of "neurotic" behavior (Karn, 1940;

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[7] It is interesting to note that, on the basis of Seligman's (1968) work, the CON subjects would be expected to become the <u>least</u> "neurotic" of these 3 groups of animals.

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In order to reach a conclusion concerning the validity of the phenomenon itself, the subjects in the present investigation were observed in the training situation on 5 seperate occasions prior to the start of training. The behaviors noted following shock-training were then compared with this "base-rate" of responding to determine the extent of any existing "neurotic" tendencies.

Finally, independent groups of CON, NC, NCP, and CNF subjects were run under one of two shock-intensity/food-deprivation conditions to test Seward's (1969) contention that differences between CON and NC subjects might be masked by a "ceiling effect" when high shock-intensities are employed. In addition, this procedure provided another test useful in evaluating the significance of conflict to the "neuroses." An attempt was made to select values of shock-intensity and food-deprivation which would result in an equivalent degree of conflict in high-intensity/high-deprivation (HH), and low-intensity/low-deprivation (LL) subjects.

If conflict was the critical factor in the development of "neurotic" behavior, the incidence of "neurosis" should then have been the same in the HH and LL CON subjects. If, on the other hand, mere exposure to aversive stimulation was the primary determinant of "neurotic" behavior, the HH subjects should

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To summarize briefly, conclusive evidence does not exist with respect to either (1) the presence of "neurotic" behavior in cats, or (2) the significance of conflict in the development of "neurosis." The procedures employed by Masserman (1943), Smart (1965), and Wolpe (1952) were common laboratory procedures which, in the majority of instances, have not been reported to result in "neurosis." The most significant of these is the punishment paradigm used with the CON subjects in these studies. In addition, adequate baseline measures were not taken for purposes of assessing the incidence of "neurotic" behavior.

In light of this, it is appropriate to proceed with caution. The assumption was made in the present investigation that the procedures employed by Masserman (1943), Smart (1965), and Wolpe (1952) <u>do not</u> lead to "neurosis," and that the changes in behavior observed can be explained (1) in terms of the existing knowledge of the effects of punishment and exposure to aversive stimulation, or (2) as artifacts of the experimental procedures employed.

The following conclusions derived from the literature dealing with punishment and the effects of non-contingent aversive stimulation appear to be relevant to the question at hand:

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1. Punishment generally has the effect of suppressing the response upon which it is contingent. That is, it acts "selectively" upon the behavior of the organism being punished, given that the aversive stimulus employed is not too intense (Church, 1963, 1969; Estes, 1944, 1969; Hunt and Brady, 1955; Myers, 1971).

2. Intense punishing stimuli have more general suppressive effects, affecting much of the ongoing behavior of the punished subject (Estes, 1944, 1969).

3. Non-contingent aversive stimulation, in contrast with punishment of the same intensity, has a quite general suppressive effect on behavior (Church, 1969; Hunt and Brady, 1955; Myers, 1971).

4. A direct relationship exists between the intensity of non-contingent aversive stimulation and the degree of suppression of ongoing activity observed (Church, 1969; Myers, 1971).

Given that these conclusions are valid, the following hypotheses appear to be in order:

1. The CON subjects in both the HH and LL conditions will appear more "neurotic" than the NC and NCP subjects when "active" measures of "neurosis" are taken (e.g., Masserman's "changes in activity," "regressive" and "bizarre" responses).

2. The NC and NCP subjects in both conditions should appear more "neurotic" when inactive measures of "neurosis" are taken (e.g., decreases in activity and "catatonia").

3. The LL CON subjects will appear more "neurotic" than the HH CON subjects when active measures of "neurosis" are taken.

4. The HH CON subjects will appear to be more "neurotic" than the LL CON subjects when inactive measures of "neurosis" are taken.

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and the LL CON subjects will be very similar to that of the CNF subjects irrespective of the measures taken, with the greatest similarity observed between the LL CON and the CNF subjects.

6. Both the HH and the LL NC and NCP subjects will appear to be more "neurotic" than the CNF subjects when measures of inactivity are taken.

7. The LL NC and NCP subjects will appear to be more "neurotic" than the HH NC and NCP subjects when measures of activity are taken.

8. The HH NC and NCP subjects will appear to be most "neurotic" when measures of inactivity are taken.

In general, when active measures of "neurosis" are considered, the CNF subjects are expected to appear most "neurotic" followed, in order of decreasing incidence of "neurosis," by the CON, NCP, and NC subjects. Exactly the opposite result is expected when inactive measures of "neurosis" are considered.

METHOD

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Subjects

The Ss were 56 cats, unselected for strain and sex, ranging in age from 11-28 weeks at the time of their arrival to the animal colony. The Ss were obtained from random sources in the Grand Rapids, Michigan Metropolitan Area in litters of at least 4 animals. All of the Ss were "wormed" as soon as they were obtained, which was the only conditioning procedure employed.

The Ss were maintained in cages in pairs on a diet of Purina Cat Chow and *ad lib* water. All of the Ss were given a 30 min "exercise" period each day, which simply consisted of allowing them to roam freely within the confines of the animal colony room. Each of the Ss was weighed daily throughout the course of the experiment.

Apparatus

Weight measures were determined with a Chatillon Model 350 hanging scale. The capacity of the scale was 30 lbs, calibrated in 1/4 oz units. Vocalizations were recorded with 2 Panasonic Auto-stop portable cassette tape recorders, running on house current.

A 29 gal aquarium fitted with a 1/4 in glass plate top was used as an observation chamber in determining the Ss' reactions to caged mice. The mice were contained in a 1 gal glass aquarium, which was also fitted with a 1/4 in glass

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A large "cricket" toy was used to produce the novel stimulus employed in testing the Ss for "neurotic hypersensitivity." The object used to test the Ss' reactions to a manipulandum was a styrofoam ball, 2 in in diameter, and attached to a 17 in nylon cord. When lowered into the apparatus, the ball was 2 in above the floor of the shock-chamber.

The shock-chamber measured 20 in on each side. The sides of the chamber were constructed of 3/8 in unfinished plywood, and the top, front, and back of the chamber consisted of 1/2 in hardware cloth. The inside walls of the chamber were lined with 1/8 in clear plexiglas. A detachable 8 oz metal cup was attached to one corner of the shock-chamber, and the top of the cup was 4 in above the floor of the chamber. The buzzer used as a CS was attached to the wall of the shock-chamber in the corner opposite the food cup, 2 in below the top of the chamber. The intensity of the buzzer CS was 96 db.

The UCS was scrambled electric shock with an intensity of either 2.5 or 4.0 mA, delivered through a grid floor consisting of 1/2 in steel tubes, placed 1/2 in apart. The shock source was an Applegate Model 250 DC stimulator, and the shock was scrambled with a relay-sequencing device for scrambling grid-shock designed by Hoffman and Fleshler (1962).

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The duration of the CS and UCS presentations was controlled by 2 Industrial Timers. All other time intervals were measured with a stopwatch.

An Esterline-Angus Model AW multiple-channel recorder was used to record the activities of the Ss in the shock-chamber. A keyboard containing 8 keys was mounted in front of the shock-chamber. Each key corresponded to a particular activity, and depression of a given key deflected one of the pens on the recorder. The paper tape on the recorder advanced at a speed of 1.5 in per min.

Procedure

14 litters of Ss were randomly assigned to either a low-deprivation/low-intensity shock (LL, 7 litters, N=32), or a high-deprivation/high-intensity shock (HH, 7 litters, N=34) condition. They were then placed on a 6 day feeding regimen. The HH Ss were given free access to food for 6 consecutive hrs every 2 days. The LL Ss were given access to food for the same period of time each day. Thus, the HH Ss were approximately 42 hrs deprived at the start of each session, and the LL Ss were approximately 18 hrs deprived. This feeding schedule was maintained throughout the course of the experiment.

Following the 6 day feeding regimen, the size of each litter was reduced to 4 Ss by randomly discarding the excess animals. The Ss

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animals. The Ss in both the HH and LL conditions were run in 7 "replications" (Smart, 1965) of 4 Ss each. A replication consisted of the 4 Ss from a given litter, randomly assigned to the 4 experimental groups (conflict, non-conflict, non-conflict predictable, and confinement).[8]

The experiment was conducted in 3 phases: (1) a baseline measure (BLM) period, (2) shock (SH) training, and (3) a test period.

Baseline procedures and measures taken: Following the assignment of the Ss in the HH and LL conditions to the 4 experimental groups, and prior to the start of shock ("neurosis") training, the Ss were observed on 5 seperate occasions to determine the base-rates of occurrence of the various behaviors that were subsequently employed as indices of "neurosis." The baseline measures for the LL Ss were taken each day for 5 consecutive days, while the Ss in the HH groups were run every 2 days.

The measures taken during the BLM period included a modified version of a "behavior check-list" developed and reported by Masserman and Yum (1946). The items included in the checklist used in the present study were

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[8] The Ss were run in replications consisting of littermates in order to control for the possible effects of early experience, which would be expected to influence certain of the measures taken (e.g., "Attraction to caged mice").

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B. Reaction to the experimenter,
C. Attraction to the apparatus,
D. Escape behavior,
E. "Neurotic" hypersensitivity,
F. "Neurotic" motor disturbance,
G. Autonomic changes,
H. Regressive substitutive behavior, and
I. Reaction to manipulandum.

All of these measures, except "I", were taken by Masserman (1943) and Smart (1965). These workers took several additional measures as well, but these were not possible in the present study because of procedural differences (e.g., "Reaction to feeding signal").[9]

The attraction of the Ss to caged mice (A) was the first measure taken each day. The S was placed in the large aquarium for a period of 2 min. The small aquarium containing 2 common house-mice (Mus) had previously been placed in one corner of the large aquarium. The S's reactions to the mice were observed and recorded during the 2 min confinement period, following which the S was released.

The reaction of each S to the experimenter (B) was determined while the S was being carried (by hand) from the animal colony to the experimental room, a distance of approximately 60 ft. Attraction to the apparatus (C) was determined as the S was being placed into the shock-chamber.

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[9] The checklist items, scoring criteria, and checklist data for the individual Ss are provided in Appendix B.

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Escape behavior (D) was measured by giving each S 3 successive opportunities to leave the shock-chamber. The door to the chamber was opened and it remained open for 15 sec. on each occasion. The initial opening occurred after the S had been in the chamber for 30 sec, with the succeeding openings occurring at 45 sec intervals.

"Neurotic" hypersensitivity (E) was measured by introducing a novel stimulus while the S was in the shock-chamber. The novel stimulus consisted of 3 "clicks" produced by the "cricket" toy. The clicks were presented at the begining of the 7th min of confinement in the shock-chamber, and successive clicks were seperated by an interval of approximately 2 sec.

Evaluation of "neurotic" motor activity (F), autonomic changes (G), and regressive substitutive behavior (H) was based upon observation of the S during the 10 min period of confinement in the shock-chamber which followed the determination of escape behavior (D).

The S's reaction to the manipulandum (I) was recorded just before his removal from the shock-chamber at the end of the 10 min confinement period. The styrofoam ball was lowered into the chamber and left in position for 1 min. The S was then removed from the shock-chamber and returned to its home cage.

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Shock training

Each S remained in the shock-chamber for 10 min following the determination of its escape behavior (D) on each of the BLM days. The activities of the S during this time were recorded using 8 channels of the Esterline-Angus multiple-channel recorder. The behaviors recorded on the 8 channels were

1. Inactivity,
2. General activity and exploration,
3. Escape,
4. Pacing,
5. Rubbing,
6. Trembling,
7. Piloerection, and
8. "Novel" reactions.

Channel #8 was used to record any behaviors that could not be included under the other 7 channels. The nature of these activities was noted on the paper tape as they occurred. The "novel" behaviors observed were

8a. Grooming,
b. Kneading and pawing,
c. Playing,
d. Quivering, and
e. Approach to the food cup (CON Ss, SH days only).

Finally, the number of vocalizations emitted by the Ss during the 10 min confinement period were recorded using the Panasonic tape recorders.

All of the measures above were taken on each day of the BLM period, and they were also noted during the shock training sessions.

Shock training: Shock training was begun either 1 (LL Ss) or 2 (HH Ss) day

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or 2 (HH Ss) days after the determination of the baseline rates of responding. The length of the shock-chamber confinement period during shock training was also 10 min. The Ss in the LL Condition were exposed to a varying number of 2.5 mA shocks, each with a duration of 2.0 sec. The Ss in the HH Condition were exposed to a varying number of 4.0 mA shocks, also with a duration of 2.0 sec.[10]

The number and temporal distribution of the shocks received by the Ss in a given replication were determined by the conflict (CON) S in that replication. The procedures for the various groups were as follows.

Conflict: The CON member of a replication was run first. The S was removed from the shock-chamber following the determination of its escape behavior (D), and the metal food cup containing 4 oz of Tabby-Treat Mackeral Cat Dinner was attached to the wall of the chamber. The S was then placed in the chamber once again and the stopwatch was started. The S was free to approach the food and to eat at will, but was given a shock each time it did so. The amount of time elapsing between the introduction of the S into the shock-chamber and the receipt of each shock was recorded. The S was removed

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Confinement: The confinement (CNF) member of a replication was treated identically in both the baseline and the shock training sessions. The S was never exposed to food in the shock-chamber and was not shocked.

The Ss in each replication were run under shock training conditions until the CON member of the replication failed to eat for an entire 10 min shock training session. The session

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Subjects

The Ss were 56 cats, unselected for strain and sex, ranging in age from 11-28 weeks at the time of their arrival to the animal colony. The Ss were obtained from random sources in the Grand Rapids, Michigan Metropolitan Area in litters of at least 4 animals. All of the Ss were "wormed" as soon as they were obtained, which was the only conditioning procedure employed.

The Ss were maintained in cages in pairs on a diet of Purina Cat Chow and ad lib water. All of the Ss were given a 30 min "exercise" period each day, which simply consisted of allowing them to roam freely within the confines of the animal colony room. Each of the Ss was weighed daily throughout the course of the experiment.

Apparatus

Weight measures were determined with a Chatillon Model 350 hanging scale. The capacity of the scale was 30 lbs, calibrated in 1/4 oz units. Vocalizations were recorded with 2 Panasonic Auto-stop portable cassette tape recorders, running on house current.

A 29 gal aquarium fitted with a 1/4 in glass plate top was used as an observation chamber in determining the Ss' reactions to caged mice. The mice were contained in a 1 gal glass aquarium, which was also fitted with a 1/4 in glass

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A large "cricket" toy was used to produce the novel stimulus employed in testing the Ss for "neurotic hypersensitivity." The object used to test the Ss' reactions to a manipulandum was a styrofoam ball, 2 in in diameter, and attached to a 17 in nylon cord. When lowered into the apparatus, the ball was 2 in above the floor of the shock-chamber.

The shock-chamber measured 20 in on each side. The sides of the chamber were constructed of 3/8 in unfinished plywood, and the top, front, and back of the chamber consisted of 1/2 in hardware cloth. The inside walls of the chamber were lined with 1/8 in clear plexiglas. A detachable 8 oz metal cup was attached to one corner of the shock-chamber, and the top of the cup was 4 in above the floor of the chamber. The buzzer used as a CS was attached to the wall of the shock-chamber in the corner opposite the food cup, 2 in below the top of the chamber. The intensity of the buzzer CS was 96 db.

The UCS was scrambled electric shock with an intensity of either 2.5 or 4.0 mA, delivered through a grid floor consisting of 1/2 in steel tubes, placed 1/2 in apart. The shock source was an Applegate Model 250 DC stimulator, and the shock was scrambled with a relay-sequencing device for scrambling grid-shock designed by Hoffman and Fleshler (1962).

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The duration of the CS and UCS presentations was controlled by 2 Industrial Timers. All other time intervals were measured with a stopwatch.

An Esterline-Angus Model AW multiple-channel recorder was used to record the activities of the Ss in the shock-chamber. A keyboard containing 8 keys was mounted in front of the shock-chamber. Each key corresponded to a particular activity, and depression of a given key deflected one of the pens on the recorder. The paper tape on the recorder advanced at a speed of 1.5 in per min.

<u>Procedure</u>

14 litters of Ss were randomly assigned to either a low-deprivation/low-intensity shock (LL, 7 litters, N=32), or a high-deprivation/high-intensity shock (HH, 7 litters, N=34) condition. They were then placed on a 6 day feeding regimen. The HH Ss were given free access to food for 6 consecutive hrs every 2 days. The LL Ss were given access to food for the same period of time each day. Thus, the HH Ss were approximately 42 hrs deprived at the start of each session, and the LL Ss were approximately 18 hrs deprived. This feeding schedule was maintained throughout the course of the experiment.

Following the 6 day feeding regimen, the size of each litter was reduced to 4 Ss by randomly discarding the excess animals. The Ss

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animals. The Ss in both the HH and LL conditions were run in 7 "replications" (Smart, 1965) of 4 Ss each. A replication consisted of the 4 Ss from a given litter, randomly assigned to the 4 experimental groups (conflict, non-conflict, non-conflict predictable, and confinement).[8]

The experiment was conducted in 3 phases: (1) a baseline measure (BLM) period, (2) shock (SH) training, and (3) a test period.

Baseline procedures and measures taken: Following the assignment of the Ss in the HH and LL conditions to the 4 experimental groups, and prior to the start of shock ("neurosis") training, the Ss were observed on 5 seperate occasions to determine the base-rates of occurrence of the various behaviors that were subsequently employed as indices of "neurosis." The baseline measures for the LL Ss were taken each day for 5 consecutive days, while the Ss in the HH groups were run every 2 days.

The measures taken during the BLM period included a modified version of a "behavior check-list" developed and reported by Masserman and Yum (1946). The items included in the checklist used in the present study were

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[8] The Ss were run in replications consisting of littermates in order to control for the possible effects of early experience, which would be expected to influence certain of the measures taken (e.g., "Attraction to caged mice").

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A. Attraction to caged mice,
B. Reaction to the experimenter,
C. Attraction to the apparatus,
D. Escape behavior,
E. "Neurotic" hypersensitivity,
F. "Neurotic" motor disturbance,
G. Autonomic changes,
H. Regressive substitutive behavior, and
I. Reaction to manipulandum.

All of these measures, except "I", were taken by Masserman (1943) and Smart (1965). These workers took several additional measures as well, but these were not possible in the present study because of procedural differences (e.g., "Reaction to feeding signal").[9]

The attraction of the Ss to caged mice (A) was the first measure taken each day. The S was placed in the large aquarium for a period of 2 min. The small aquarium containing 2 common house-mice (Mus) had previously been placed in one corner of the large aquarium. The S's reactions to the mice were observed and recorded during the 2 min confinement period, following which the S was released.

The reaction of each S to the experimenter (B) was determined while the S was being carried (by hand) from the animal colony to the experimental room, a distance of approximately 60 ft. Attraction to the apparatus (C) was determined as the S was being placed into the shock-chamber.

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[9] The checklist items, scoring criteria, and checklist data for the individual Ss are provided in Appendix B.

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Escape behavior (D) was measured by giving each S 3 successive opportunities to leave the shock-chamber. The door to the chamber was opened and it remained open for 15 sec. on each occasion. The initial opening occurred after the S had been in the chamber for 30 sec, with the succeeding openings occurring at 45 sec intervals.

"Neurotic" hypersensitivity (E) was measured by introducing a novel stimulus while the S was in the shock-chamber. The novel stimulus consisted of 3 "clicks" produced by the "cricket" toy. The clicks were presented at the begining of the 7th min of confinement in the shock-chamber, and successive clicks were seperated by an interval of approximately 2 sec.

Evaluation of "neurotic" motor activity (F), autonomic changes (G), and regressive substitutive behavior (H) was based upon observation of the S during the 10 min period of confinement in the shock-chamber which followed the determination of escape behavior (D).

The S's reaction to the manipulandum (I) was recorded just before his removal from the shock-chamber at the end of the 10 min confinement period. The styrofoam ball was lowered into the chamber and left in position for 1 min. The S was then removed from the shock-chamber and returned to its home cage.

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Each S remained in the shock-chamber for 10 min following the determination of its escape behavior (D) on each of the BLM days. The activities of the S during this time were recorded using 8 channels of the Esterline-Angus multiple-channel recorder. The behaviors recorded on the 8 channels were

1. Inactivity,
2. General activity and exploration,
3. Escape,
4. Pacing,
5. Rubbing,
6. Trembling,
7. Piloerection, and
8. "Novel" reactions.

Channel #8 was used to record any behaviors that could not be included under the other 7 channels. The nature of these activities was noted on the paper tape as they occurred. The "novel" behaviors observed were

8a. Grooming,
b. Kneading and pawing,
c. Playing,
d. Quivering, and
e. Approach to the food cup (CON Ss, SH days only).

Finally, the number of vocalizations emitted by the Ss during the 10 min confinement period were recorded using the Panasonic tape recorders.

All of the measures above were taken on each day of the BLM period, and they were also noted during the shock training sessions.

Shock training: Shock training was begun either 1 (LL Ss) or 2 (HH Ss) day

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following that on which this criterion was satisfied was a test session to determine the extent to which feeding inhibitions had developed in the Ss in the various groups. All Ss, in all groups, were treated identically during the test period.

Test period: Prior to the introduction of the S into the shock-chamber, a small glass bowl 4 in in diameter was placed into the chamber. The bowl contained 60 gms of a wet food mash consisting of Purina Cat Chow and water.

The original metal food cup was in place when the CON Ss were tested, but was absent when the Ss in the remaining groups were run. Two measures were taken following the introduction of the S into the shock-chamber. First, the S's latency to feeding was recorded. Then the time required to ingest the food mash was determined.

The test sessions were 10 min long and were conducted on successive days for both the HH and the LL Ss. Testing of a given S was complete once it had ingested the food mash. The Ss were placed on a total food-deprivation schedule following the criterion shock training day (SH-C), and food was available to them only in the shock-chamber.

RESULTS

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The reliability of the "Behavior Checklist" data was determined by a comparison of the independent ratings made by 2 observers for 6 Ss. The observers agreed on 44 of the 48 ratings made.[11] The data from the checklist were submitted to contingency analyses to determine if the Ss' ratings changed reliably from the final baseline measure day (Day BLM-5) to the criterion shock day (Day SH-C). The data for the LL and the HH Ss were pooled for these analyses to obtain more substantial cell frequencies.

Only 1 of 8 analyses conducted resulted in a significant difference between the groups. This was obtained for checklist item "I", "Reaction to manipulandum," and was only marginally significant (X^2=8.23, df=3, $p. < .05$).[12] It should be noted, however, that all of the changes observed were not in the same direction. Several Ss that manipulated the ball on Day BLM-5 failed to do so on Day SH-C, and *vice versa*. The ratings of the Ss in the various groups (Appendix B) were otherwise quite similar and consistent throughout the BLM and SH days.

The vocalization data (Table 1) were analyzed using the Kruskal-Wallis one-way analysis of variance by ranks. The

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[11] This is similar to the extent of agreement reported by Smart (1965) for essentially the same items.
[12] Checklist item "F", "Neurotic motor disturbance," was not analyzed as activity is treated extensively below.

Table 1 Means and Standard Deviations of Vocalization Scores.

BLM-5	SH-C

Table 1 Means and Standard Deviations of Vocalization Scores.

		BLM-5				SH-C			
		CON	NC	NCP	CNF	CON	NC	NCP	CNF
HH Groups	Mean	18.71	34.29	21.85	56.14	22.29	27.14	18.86	65.14
	S.D.	21.11	32.24	25.40	48.29	28.98	58.03	23.50	59.92
LL Groups	Mean	72.14	116.14	54.86	64.00	60.86	38.29	3.29	40.43
	S.D.	50.54	75.98	43.45	65.01	48.42	49.24	8.69	42.83

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data for the LL and the HH Ss were treated seperately, as were the data for Days BLM-5 and SH-C. The total number of vocalizations emitted by the 4 groups of LL Ss did not differ on Day BLM-5 (H=4.48, df=3, p. > .20), but a highly reliable difference was found between the groups on Day SH-C (H= 11.87, df=3, p. < .01). A look at the vocalization data in Table 1 suggests that this difference can be attributed largely to decreases in the vocalizations of the NC and NCP Ss. The vocalizations of the HH Ss did not differ on either day (H=6.41 and 6.31, respectively, df=3, p. > .10).

The frequency of occurrence of each behavior measured in the shock-chamber was noted and the total frequency scores of the Ss in the various groups were submitted to the same analysis as the vocalization data. In this case, however, the median frequency scores of the Ss on the BLM days (BLM-M) were used instead of the total number of responses made on Day BLM-5.[13] The results indicated that the frequency scores (Table 2) of the LL Ss did not differ on Day BLM-M (H=1.36, df=3, p. >.70), but a significant difference was found on Day SH-C (H=14.59, df=3, p. < .01). The frequency scores of the HH groups of Ss did not differ on either day (H=6.78 and 5.15, respectively, df=3, p. > .10).

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[13] The frequency data for each S can be found in Appendix C. The frequency scores are those enclosed in parentheses.

Table 2 Means and Standard Deviations of Frequency Scores.

	BLM-M				SH-C			
	CON	NC	NCP	CNF	CON	NC	NCP	CNF

Table 2 Means and Standard Deviations of Frequency Scores.

		BLM-M				SH-C			
		CON	NC	NCP	CNF	CON	NC	NCP	CNF
HH Groups	Mean	50.29	43.57	56.43	38.86	37.57	22.43	22.29	25.57
	S.D.	15.22	11.73	22.31	18.86	20.10	24.38	19.02	9.80
LL Groups	Mean	46.00	52.57	44.42	38.14	52.00	23.29	7.57	22.86
	S.D.	18.64	23.82	23.39	21.61	31.46	21.27	7.87	6.36

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All of the activity measures taken in the shock-chamber were analyzed using the augmented form of the Cornfield-Tukey Algorithm (described by Dayton, 1970). The Algorithm is a factorial analysis of variance in which Ss are "nested" within the treatment levels of one dimension, and crossed on the second dimension. In this case, the Ss were nested within groups and crossed with respect to days.

The use of the Algorithm permitted the testing of group differences, changes in behavior over days, and the groups x days interactions. However, since the nesting of Ss within groups resulted in an n=1 per cell, the appropriate error term was not available for testing the effects of Ss and the Ss x days interactions.

Only the data for the first 540 sec of shock-chamber confinement were analyzed. The total time spent engaged in the various activities of interest was recorded, as was the frequency of occurrence of the behaviors.[14]

Masserman (1943) identified several "neurotic symptoms" in his cats, and these formed the bases for the analyses of the shock-chamber activity data. Among the symptoms mentioned by Masserman were (1) changes in spontaneous activity, (2) bizarre counterphobic responses, and (3) regressive substit-

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[14] The shock-chamber activity data for each S is also available in Appendix C.

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utive behaviors. Pacing, rubbing, and kneading of the paws were considered to be bizarre counterphobic responses, and playing and grooming were identified as regressive substitutive behaviors. Masserman's specification of these "symptoms" led to the analysis of the following shock-chamber activities:

1. Total activity. This measure was obtained by subtracting the S's inactivity score from 540 sec. All of the activities listed below are included in this measure.

2. General activity. This measure indicates the amount of time spent in activities which could not be incorporated into any other category.

3. Escape behavior. This was simply the total amount of time the S spent trying to get out of the shock-chamber.

4. Regressive substitutive behaviors. This measure was based on the amount of time a given S spent grooming and/or playing.

5. Bizarre counterphobic responses. This score was based on pacing, rubbing, and kneading and was obtained by subtracting all of the other activity scores for a given S from 540 sec. This was necessary because the behaviors are not mutually exclusive and simple addition of the individual scores would have resulted in values which exceeded the total time spent in the shock-chamber for some Ss.

The data obtained from the LL and the HH groups of Ss were analyzed seperately. The analogous groups under the 2 deprivation/shock conditions were then compared as well. The data for each of the measures described above were analyzed under each deprivation/shock condition for Days BLM-1 through BLM-5 to determine if any

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to determine if any changes in behavior resulted from confinement or habituation to the apparatus (Tables 3-7). The baseline performance of the Ss in the various groups was then compared with their behavior on Day SH-C (Tables 8 and 9). The Ss' median scores for each of the measures taken during the baseline period were assumed to be representative of their baseline performance, and these were the scores (BLM-M) compared with the Ss' post-shock behavior.

The LL groups of Ss did not differ in total activity on the BLM days ($F=.177$, $df=3,24$, $p. > .75$) and their activity level remained fairly constant throughout the baseline period ($F=.910$, $df=4,96$, $p. > .75$).[15] The LL groups also did not differ in general activity ($F=2.063$, $df=3,24$, $p. > .10$), escape ($F=1.19$, $df=3,24$, $p. > .25$), regressive substitutive behaviors ($F=2.033$, $df=3,24$, $p. > .10$), or in the incidence of bizarre responses ($F=.174$, $df=3,24$, $p. > .75$).

Significant changes in the behavior of the LL groups were obtained as a function of days, however, for escape ($F=3.89$,

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[15] Homogeneity of variance and homogeneity of covariance requirements must be satisfied in using the Algorithm. Where heterogeneity pertains, a "conservative" testing procedure involving an adjustment in degrees of freedom is used (Dayton, 1970). The F-ratios obtained in the analyses to be reported were evaluated using both the customary and the conservative df. All but 3 of these ratios were significant by both standards. Analysis of the variance-covariance matrices in these 3 instances indicated that the homogeneity requirements were fulfilled.

Table 3 Means and Standard Deviations of Total Activity Scores: Days BLM 1-5.

		Day				
Group		BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
CON	Mean	424.43	476.00	457.00	427.14	368.57
	S.D.	103.10	49.37	92.50	100.92	167.20

Table 3 Means and Standard Deviations of Total Activity Scores: Days BLM 1-5.

Group			Day				
			BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
HH Groups	CON	Mean	424.43	476.00	457.00	427.14	368.57
		S.D.	103.10	49.37	92.50	100.92	167.20
	NC	Mean	436.86	457.57	461.71	428.43	397.14
		S.D.	41.89	95.44	107.99	142.61	112.57
	NCP	Mean	417.86	431.86	449.57	435.29	405.86
		S.D.	101.55	99.29	101.91	141.76	166.86
	CNF	Mean	292.00	397.00	431.43	424.14	412.57
		S.D.	170.95	83.16	43.97	72.88	46.78
LL Groups	CON	Mean	465.86	466.14	446.86	419.14	433.43
		S.D.	45.55	58.95	121.84	185.16	194.58
	NC	Mean	408.71	417.14	427.00	436.86	441.29
		S.D.	188.65	150.26	157.03	179.55	149.82
	NCP	Mean	368.71	419.43	380.71	459.14	518.57
		S.D.	200.14	191.85	186.98	103.98	18.16
	CNF	Mean	418.57	392.43	374.71	414.14	378.00
		S.D.	152.18	137.64	129.98	118.31	144.80

Table 4 Means and Standard Deviations of General Activity Scores: Days BLM 1–5.

Group		Day				
		BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
CON	*Mean*	126.00	151.57	140.14	158.29	69.57
	S.D.	58.94	63.27	90.53	52.53	65.94
				[illegible]	[illegible]	158.14

Table 4 Means and Standard Deviations of General Activity Scores: Days BLM 1-5.

Group			Day				
			BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
HH Groups	CON	Mean	126.00	151.57	140.14	158.29	69.57
		S.D.	58.94	63.27	90.53	52.53	65.94
	NC	Mean	138.29	186.00	185.43	219.86	158.14
		S.D.	77.42	78.31	84.87	88.60	81.76
	NCP	Mean	121.14	152.14	159.14	178.57	141.00
		S.D.	79.99	113.96	48.42	79.95	81.79
	CNF	Mean	93.14	121.86	145.43	163.57	130.71
		S.D.	64.29	64.00	45.83	76.37	86.19
LL Groups	CON	Mean	256.86	202.43	219.00	180.57	217.14
		S.D.	141.71	98.67	111.44	103.88	126.76
	NC	Mean	164.43	124.14	159.43	121.14	158.43
		S.D.	137.43	95.46	63.84	89.38	70.14
	NCP	Mean	177.71	120.71	108.57	148.43	182.14
		S.D.	110.47	92.38	72.65	79.34	101.69
	CNF	Mean	126.71	95.86	163.29	137.14	118.29
		S.D.	55.61	96.22	158.81	108.19	92.26

Table 5 Means and Standard Deviations of Escape Scores: Days BLM 1-5.

Group			Day				
		BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
CON	Mean	95.86	78.71	83.00	41.43	40.71
	S.D.	105.44	83.66	103.49	54.63	60.90

Table 5 Means and Standard Deviations of Escape Scores: Days BLM 1-5.

Group			Day				
			BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
HH Groups	CON	Mean	95.86	78.71	83.00	41.43	40.71
		S.D.	105.44	83.66	103.49	54.63	60.90
	NC	Mean	152.86	84.14	129.00	66.57	69.43
		S.D.	156.66	144.42	115.82	91.44	94.50
	NCP	Mean	161.71	83.43	111.43	94.71	71.14
		S.D.	172.38	89.50	114.14	69.21	71.24
	CNF	Mean	77.71	51.71	70.86	56.29	29.14
		S.D.	80.89	44.83	93.80	56.98	32.09
LL Groups	CON	Mean	96.00	92.43	43.43	50.86	19.43
		S.D.	163.74	136.70	58.51	45.54	26.66
	NC	Mean	119.14	96.00	74.86	66.29	57.14
		S.D.	167.50	135.31	45.85	51.70	55.26
	NCP	Mean	93.14	19.71	49.14	67.29	29.86
		S.D.	121.48	25.41	48.51	56.71	24.18
	CNF	Mean	52.00	24.00	16.57	18.57	2.57
		S.D.	49.47	31.94	16.63	43.95	5.59

Table 6 Means and Standard Deviations of Regressive Responses Scores: Days BLM 1–5.

Group		BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
		Day				
CON	Mean	118.00	144.14	153.43	141.29	133.71
	S.D.	162.49	124.50	132.98	100.76	138.39

Table 6 Means and Standard Deviations of Regressive Responses Scores: Days BLM 1-5.

Group			Day				
			BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
HH Groups	CON	Mean	118.00	144.14	153.43	141.29	133.71
		S.D.	162.49	124.50	132.98	100.76	138.39
	NC	Mean	82.00	133.71	106.57	74.00	112.86
		S.D.	102.45	126.95	50.60	73.12	82.15
	NCP	Mean	96.14	80.14	107.14	58.43	137.57
		S.D.	101.15	112.19	94.41	73.72	144.60
	CNF	Mean	110.43	198.00	175.86	167.43	227.14
		S.D.	70.84	133.74	112.57	179.92	157.94
LL Groups	CON	Mean	41.86	65.14	41.00	41.29	89.14
		S.D.	45.99	63.25	51.88	51.98	79.46
	NC	Mean	19.43	70.86	60.57	69.57	45.86
		S.D.	21.65	74.16	54.04	83.38	51.81
	NCP	Mean	18.00	150.86	67.00	99.00	109.71
		S.D.	14.31	175.60	109.78	90.00	77.40
	CNF	Mean	135.14	151.29	118.57	147.29	167.29
		S.D.	163.14	117.65	135.22	167.83	171.32

Table 7 Means and Standard Deviations of Bizarre Responses Scores: Days BLM 1-5.

Group		Day BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
CON	Mean	86.00	101.57	80.43	84.71	124.57
	S.D.	132.27	146.29	108.61	88.35	154.96

Table 7 Means and Standard Deviations of Bizarre Responses Scores: Days BLM 1-5.

Group			Day				
			BLM-1	BLM-2	BLM-3	BLM-4	BLM-5
HH Groups	CON	Mean	86.00	101.57	80.43	84.71	124.57
		S.D.	132.27	146.29	108.61	88.35	154.96
	NC	Mean	72.71	53.71	41.57	71.29	56.57
		S.D.	64.57	63.81	58.08	103.71	104.45
	NCP	Mean	53.14	114.00	71.86	103.71	56.14
		S.D.	110.04	145.32	91.98	107.10	88.49
	CNF	Mean	15.29	25.43	39.29	37.14	24.14
		S.D.	20.56	38.05	29.22	47.67	34.44
LL Groups	CON	Mean	69.71	106.86	143.43	146.43	107.71
		S.D.	103.89	164.54	180.15	125.88	103.98
	NC	Mean	104.29	126.14	130.71	179.86	179.86
		S.D.	128.04	129.88	91.57	176.91	182.75
	NCP	Mean	80.71	128.14	156.00	144.43	196.86
		S.D.	123.22	160.52	187.88	172.51	113.41
	CNF	Mean	108.86	122.29	76.29	96.86	89.86
		S.D.	137.42	173.07	144.42	164.46	140.24

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16 Sheffe's metho

df=4,96, p. < .05), and bizarre responses (F=3.446, df=4,96, p. < .05). These differences were of marginal significance, however, and individual comparisons using the conservative Sheffe technique did not yield any significant contrasts.[16]

No differences were found over days for the LL Ss in total activity (F=.910, df=4,96, p. > .75), general activity (F=1.270, df=4,96, p. >.25), or regressive substitutive behaviors (F=1.327, df=4,96, p. > .25), and none of the groups x days interactions approached significance.

The HH groups of Ss did not differ on any of the measures taken over BLM days 1-5. The largest F-ratio obtained for these comparisons was 2.033 for regressive substitutive behaviors (df=3,24, p. > .10). Highly reliable differences were found over days for escape (F=7.374, df=4,96, p. < .001) and general activity (F=6.240, df=4,96, p. < .001), however, and a marginally significant result was obtained for total activity (F=2.63, df=4,96, p. < .05).

Further analysis of the baseline escape data indicated that the NC Ss engaged in significantly less escape behavior on Days BLM-4 and BLM-5 than they did on Day BLM-1 (F=8.873 and 8.295, respectively, df=4,34, p. < .05). The NCP Ss were also less prone to escape on Day BLM-5 than they were on Day BLM-1 (F=9.776, df=4,34, p. < .025). None of the individual

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16 Sheffe's method was used for all individual comparisons.

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comparisons of the general activity data yielded a significant result, and no significant groups x days interactions were found for the HH Ss on any of the measures.

Analyses of the behaviors of the LL groups of Ss on Days BLM-M and SH-C indicated that the groups differed in total activity ($F=4.73$, $df=3,24$, $p. < .01$), and that significant changes in activity occurred over days ($F=36.27$, $df=1,24$, $p. < .001$). These was also a significant groups x days interaction on this measure ($F=11.36$, $df=3,24$, $p. < .001$).

It was subsequently found that the effects of groups could be attributed to significant decreases in the activity of the NCP Ss on Day SH-C. This group was significantly less active than both the CON Ss ($F=19.003$, $df=3,27$, $p. < .001$) and the CNF Ss ($F=19.092$, $df=3,27$, $p. < .001$) on Day SH-C. None of the remaining contrasts were significant.

The days effect observed was a function of the activity of the NC and NCP Ss on Day SH-C, which differed significantly from their activity on Day BLM-M. Both of these groups of Ss were less active on Day SH-C ($F=20.068$ and 42.409, respectively, $df=1,13$, $p. < .001$).

The effect of groups was also significant for the LL Ss on the measure of general activity ($F=5.491$, $df=3,24$, $p. < .01$). Once again, the effect was attributable to a highly reliable difference between the NCP Ss and the CON and CNF

Table 8 Means and Standard Deviations of LL Shock-chamber Activity Scores.

		BLM–M				SH–C			
		CON	NC	NCP	CNF	CON	NC	NCP	CNF
	Mean	449.46	439.57	416.86	404.71	414.00	200.57	47.71	414.86
Total activity								[illegible]	[illegible]

Table 8 Means and Standard Deviations of LL Shock-chamber Activity Scores.

		BLM-M				SH-C			
		CON	NC	NCP	CNF	CON	NC	NCP	CNF
Total activity	Mean	449.46	439.57	416.86	404.71	414.00	200.57	47.71	414.86
	S.D.	121.33	162.95	188.23	112.88	69.28	194.96	62.89	39.16
General activity	Mean	181.86	158.43	132.29	126.00	231.29	119.86	33.57	229.29
	S.D.	96.40	66.18	89.02	81.35	107.17	121.57	56.29	99.29
Escape	Mean	43.29	64.43	48.43	5.14	56.29	21.71	1.00	28.29
	S.D.	56.03	49.96	41.17	7.29	90.66	38.82	2.65	34.72
Regressive Rs	Mean	43.57	43.86	68.71	146.14	77.43	18.57	12.00	160.57
	S.D.	51.61	47.86	92.86	153.72	95.93	40.99	17.50	151.85
Bizarre Rs	Mean	113.57	131.71	130.57	98.86	61.86	38.57	0.43	22.43
	S.D.	126.51	125.13	154.29	141.35	79.80	61.88	1.13	47.51

Table 9 Means and Standard Deviations of HH Shock-chamber Activity Scores.

		BLM-M				SH-C			
		CON	NC	NCP	CNF	CON	NC	NCP	CNF
Total activity	Mean	451.43	447.00	445.43	409.86	297.43	162.29	171.00	399.86
		[illegible]	[illegible]	[illegible]	47.27	204.43	213.10	173.28	90.63

Table 9 Means and Standard Deviations of HH Shock-chamber Activity Scores.

		BLM-M				SH-C			
		CON	NC	NCP	CNF	CON	NC	NCP	CNF
Total activity	Mean	451.43	447.00	445.43	409.86	297.43	162.29	171.00	399.86
	S.D.	40.56	98.87	99.42	47.27	204.43	213.10	173.28	90.63
General activity	Mean	138.86	165.43	149.86	128.00	83.43	71.71	98.43	142.57
	S.D.	45.82	56.96	62.68	64.25	57.42	131.98	117.92	43.23
Escape	Mean	63.00	86.14	89.14	41.85	3.86	0.00	3.29	2.71
	S.D.	65.50	118.07	86.13	49.82	10.21	0.00	8.69	7.18
Regressive Rs	Mean	129.71	89.43	90.43	166.00	56.71	60.71	25.43	183.86
	S.D.	104.29	60.84	90.00	117.25	79.67	97.11	50.56	112.14
Bizarre Rs	Mean	106.29	52.71	90.71	27.43	97.57	11.71	20.00	60.29
	S.D.	127.05	63.71	108.94	31.87	136.27	30.99	50.74	69.94

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groups. The NCP Ss were significantly less active than these groups on Day SH-C ($F=21.855$ and 21.415, respectively, $df=1, 13$, $p. < .001$).

The LL groups of Ss did not differ on the measures of escape and regressive substitutive behaviors, and the days effect was also unreliable for these measures. A significant groups x days interaction was obtained for the latter measure, however ($F=7.642$, $df=3,24$, $p. < .001$).

The LL groups also did not differ on the measure of bizarre responses ($F=.186$, $df=3,24$, $p. > .75$), but a significant change in the behavior of the Ss was observed from Day BLM-M to Day SH-C ($F=13.599$, $df=1,24$, $p. < .01$). A significant reuction in the incidence of bizarre responses was observed for both the NC and the NCP Ss on Day SH-C ($F=3.281$, $df=1,13$, $p. < .025$, and $F=7.460$, $df=1,13$, $p. < .001$, respectively).

A significant change in the total activity of the HH Ss was observed from Day BLM-M to Day SH-C ($F=27.96$, $df=1,24$, $p. < .001$), although the groups did not differ on either day ($F=1.37$, $df=3,24$, $p. > .75$). The groups x days interaction was also significant ($F=3.530$, $df=3,24$, $p. < .05$). The overall effect of days in this instance was the result of decreases in the total activity of the CON Ss ($F=5.073$, $df=1, 13$, $p. < .05$), the NC Ss ($F=17.338$, $df=1,13$, $p. < .001$), and the NCP Ss ($F=16.108$, $df=1,13$, $p. < .005$) on Day SH-C.

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A significant overall effect of days was also observed for the HH Ss on the measure of general activity ($F=4.487$, $df=1,24$, $p. < .05$), but none of the individual comparisons approached an acceptable level of significance. The HH groups also differed in escape behavior ($F=7.189$, $df=3,24$, $p. < .05$), and the extent of their escape activity decreased from Day BLM-M to Day SH-C ($F=28.73$, $df=1,24$, $p. < .001$).

Although the individual comparisons between groups failed to yield a reliable difference on either day, the escape activity of the CON ($F=5.503$, $df=1,13$, $p. < .05$), NC ($F=11.647$, $df=1,13$, $p. < .001$), and NCP ($F=11.597$, $df=1,13$, $p. < .001$) Ss decreased significantly from Day BLM-M to Day SH-C. A significant groups x days interaction was also obtained for the escape measure ($F=10.208$, $df=3,24$, $p. < .001$).

The HH Ss did not differ on the measure of bizarre responses ($F=1.158$, $df=3,24$, $p. > .25$), but a marginally significant result was obtained for regressive substitutive behaviors ($F=3.331$, $df=3,24$, $p. < .05$). Subsequent individual comparisons failed to yield a significant difference between the groups on either day.

Comparisons of the analogous LL and HH groups of Ss resulted in only one difference. The LL and HH CON Ss were found to differ on the measure of general activity ($F=14.093$, $df=1,12$, $p. < .001$). The HH CON Ss were significantly less

Table 10 Summary of Analyses of Shock-chamber Activity Scores: Days BLM-M and SH-C.

	Condition					
	HH			LL		
	Groups	Days	G x D	Groups	Days	G x D

Table 10 Summary of Analyses of Shock-chamber Activity Scores: Days BLM-M and SH-C.

	Condition					
	HH			LL		
	Groups	Days	G x D	Groups	Days	G x D
Total activity	ns	.001	.05	.01	.001	.001
General activity	ns	.05	ns	.01	ns	ns
Escape	.05	.001	.001	ns	ns	ns
Regressive behaviors	.05	ns	ns	ns	ns	.001
Bizarre responses	ns	ns	ns	ns	.01	ns

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active than the LL CON Ss on Day SH-C ($F=14.022$, $df=1,13$, $p. < .005$). None of the remaining groups effects or groups x days interactions approached significance.[17]

A two-way analysis of variance was applied to the feeding latency and feeding time scores (Table 11) of the LL and the HH Ss, and differences were found on both of these measures. Differences in feeding latencies were obtained between the LL and HH deprivation/shock conditions ($F=5.513$, $df=1,48$, $p. < .05$), and as a function of groups ($F=3.695$, $df=3,48$, $p. < .05$). The deprivation/shock condition x groups interaction was also significant ($F=3.715$, $df=3,48$, $p. < .05$).

Subsequent individual comparisons showed that the LL CON Ss required significantly more time to begin eating than all of the other groups of Ss, which did not differ. All of the comparisons were significant beyond the .01 level of confidence. The individual comparisons of the feeding time data did not result in any significant differences between the groups of Ss, although the overall analysis of variance was significant for deprivation/shock condition ($F=3.004$, $df=1, 48$, $p. < .05$).

The final analysis to be reported contrasted the number of shocks received by the LL CON and the HH CON Ss (Table 12).

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17 Several comparisons yielded significant effects of days, of course, but it would be redundant to mention them here as they were dealt with previously.

Table 11 Means and Standard Deviations of LL and HH Feeding Time and Feeding Latency Scores.

	Latency				Time			
	CON	NC	NCP	CNF	CON	NC	NCP	CNF

Table 11 Means and Standard Deviations of LL and HH Feeding Time and Feeding Latency Scores.

		Latency				Time			
		CON	NC	NCP	CNF	CON	NC	NCP	CNF
HH Ss	Mean	6.29	10.14	7.57	5.00	252.86	284.00	229.71	262.86
	S.D.	1.89	11.11	6.80	0.00	175.83	191.10	141.38	108.39
LL Ss	Mean	624.21	225.87	6.43	5.00	280.71	357.14	329.29	365.71
	S.D.	258.61	85.37	1.987	0.00	53.57	181.79	182.33	149.48

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The two groups of Ss were not found to differ on this measure ($t=1.27$, $df=12$, $p. > .90$).[18]

Table 12 Means and Standard Deviations of Shock Scores.

	LL CON	HH CON
Mean	10.00	7.43
S.D.	3.11	4.65

The weight measures taken throughout the course of the experiment were discarded, as they were not sufficiently reliable to warrent analysis.

[18] A summary of the results of the major analyses of the shock-chamber activity data can be found in Table 10, and summary tables for all analyses appear in Appendix A.

DISCUSSION

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Masserman (1943) identified a number of "neurotic symptoms" which were characteristic of his cats. These were subsequently noted, and apparently confirmed, by Smart (1965) and Wolpe (1952), although the explanations offered for the development of the "neuroses" differed among these workers. The "symptoms" noted by Masserman (1943) included (1) changes in spontaneous activity, (2) regressive substitutive behaviors, such as playing and grooming, (3) bizarre counterphobic responses, including pacing, rubbing and pawing, and (4) "neurotic" motor disturbances, such as convulsions and tics.

All of these behaviors, with the exception of convulsions, were observed in the course of the present investigation. However, they were observed from the very first baseline measure (BLM) day, prior to the introduction of the treatment which Masserman (1943) claimed was necessary to produce the "neuroses."

S LL-CON-1, for example, was active for 415 sec on Day BLM-1, and totally inactive on Day BLM-5.[19] S LL-NCP-6 played for 471 sec of the 540 sec shock-chamber confinement period on Day BLM-2. S HH-CNF-7 groomed for 510 sec on Day BLM-2, and S LL-NCP-2 paced for 297 sec on Day BLM-3. S

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19 The designation used for the Ss specifies condition (HH or LL), group, and litter, respectively.

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HH-CON-1 kneaded for 390 sec on Day BLM-2 and rubbed for 412 sec on Day BLM-3. A curious "jerking" of the rear limbs, which could possibly be called a "tic" was observed 55 times on Day BLM-4 in S HH-NC-2. Masserman (1943) also noted that some of his "neurotic" animals were characterized by "excessive loud vocalizing." S LL-CON-6 vocalized 375 times in a 10 min period on the first day of the BLM period.

At any rate, the behaviors specified by Masserman as "neurotic symptoms" are representative of "normal" animals confined in a conditioning apparatus. The examples given above are the extreme scores obtained for these measures, but they should not be considered negative instances of what was typically observed. A glance at the activity data for the individual Ss in Appendix C will verify this.

It was suggested earlier that Masserman's (1943) results may simply have been artifacts of the experimental procedures he employed, and the findings in this study suggest that this was the case. Masserman trained his Ss to manipulate a lever on signal to obtain the contents of a food box. He then made his baseline observations to be used for purposes of comparison with the behaviors observed following the introduction of the "motivational conflict" presumed necessary for the development of the "neuroses." This preliminary training required 1-8 days and, in the case of some Ss, more than 100 trials.

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One possible effect of this training would be the inhibition of responses unrelated to the procurement of food. Behaviors compatible with those necessary to obtain reward would, on the other hand, be strengthened. Masserman may have thus extinguished many of the responses customarily exhibited by cats by selectively reinforcing only those compatible with lever-pressing. Masserman's description of the behavior of his Ss seems to support this inference.

> Cats which developed normal feeding responses jumped into the experimental cage with apparent eagerness as soon as they were permitted to do so and strongly resisted being removed from it. <u>Such animals apparently awaited the feeding signals with equal avidity and showed in their behavior a definite capacity to anticipate accurately signals given at regular intervals of one or two minutes</u> (1943, p. 59, italics mine).

Ss anticipating feeding signals probably would not be engaged in activities unrelated to feeding, such as playing, grooming, kneading and rubbing.

Introduction of aversive stimulation to establish a conflict could then have disinhibited the responses which underwent extinction earlier in training. The result would be a "change in spontaneous activity" when contrasted with the quiet anticipation of the feeding signal, and the emergence of the behaviors inhibited previously.

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failure to obtain significant differences between the groups on the checklist items devised by Masserman (1943; Masserman and Yum, 1946). Masserman's cats were fed in his conditioning apparatus, and the situational cues probably acquired secondary reinforcing properties. His Ss jumped into it "with apparent eagerness...and strongly resisted being removed from it." As the Ss in the present investigation were never fed in the apparatus prior to the recording of baseline measures, the apparatus was probably aversive to the cats on both the BLM and the shock (SH) days. Hence, no differences were observed on the checklist items.[20]

It was hypothesized that the changes in behavior observed would be explicable on the basis of existing knowledge of the effects of exposure to aversive stimulation. It is well-documented that punishment has relatively specific effects upon the behavior of punished animals (Church, 1963, 1969; Estes, 1944, 1969), and Masserman's (1943) "conflict" situation involved the punishment of consummatory responses. One might expect, then, that consummatory responses would be suppressed while other ongoing activities would be relatively unaffected.

The results obtained supported this hypothesis. The

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[20] The only significant difference obtained was for item "I", "Reaction to manipulandum," which was not taken by Masserman.

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conflict (CON) Ss did not differ from the confinement (CNF) controls on any of the measures taken in either the LL or the HH deprivation/shock conditions. Furthermore, only one statistically reliable change in behavior was obtained for the CON Ss from Day BLM-M to Day SH-C. The escape activity of the HH CON, HH NC, and HH NCP Ss decreased significantly on Day SH-C, but this may have been the result of habituation to the apparatus rather than the effects of shock. The escape scores of the HH CNF Ss were also low and similar to those of the other groups. The pre- and post-shock performance of the CON Ss did not differ on any of the remaining measures.

The punishment literature also led to the hypothesis of greater response suppression in the HH CON Ss than in the LL CON Ss, as a direct relationship is reported to exist between the intensity of punishment and the degree and generality of response suppression (Church, 1969; Estes, 1944). This hypothesis was only partially supported, as the HH CoN Ss and the LL CON Ss differed on only 1 of the 5 measures taken. The HH CON Ss exhibited general activity scores that were significantly lower than the scores of the LL CON Ss. Both of the shock-intensities employed appeared to be quite aversive, however, and more differences might have been found if a wider range of intensity values had been employed.

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The results of other work suggest that non-contingent aversive stimulation leads to greater and more general suppression of behavior than punishment (Church, 1969; Hunt and Brady, 1955; Myers, 1971). It was thus hypothesized that the behavior of the NC and the NCP Ss would be suppressed to a greater extent than the behavior of the CON Ss.

The results provided some support for this hypothesis. The LL NCP Ss exhibited significantly lower total activity and general activity scores on Day SH-C than both the LL CON and the LL CNF Ss. There was also a significant decrease in the total activity and the general activity scores of the LL NC and the LL NCP Ss from Day BLM-M to Day SH-C. No such decrease was observed in the activity scores of the LL CON Ss.

The total activity of the HH NC and the HH NCP Ss also decreased from Day BLM-M to Day SH-C, while only a slight and unreliable decrease was observed in the HH CON Ss. A reduction in the incidence of bizarre responses was also observed in the LL NC and the LL NCP Ss on Day SH-C.

A significant difference supporting the hypothesized effects of non-contingent aversive stimulation was also obtained for the LL vocalization scores. The vocalizations of the LL CON Ss did not change appreciably from Day BLM-5 to Day SH-C, while a large decrease in vocalizations was observed in the LL NC and a

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Masserman (1943) also suggested that "neurotic" animals adopt "stereotyped" modes of responding in conflictual situations. If this is true, one might expect the total frequency of responses made by the CON Ss to decrease following exposure to conflict. This was not found to be the case. Analysis of the frequency data did indicate a difference in the total number of responses made by the LL groups on Day SH-C, but the LL NC and the LL NCP Ss exhibited the lowest frequency scores. This finding is, of course, consistent with the hypothesized effects of non-contingent aversive stimulation.

More generally, it was hypothesized that the incidence of "neurotic" behavior would be the greatest in the CNF Ss. The CON Ss were expected to exhibit somewhat less "neurotic" behavior, followed by the NCP and the NC Ss. The rankings actually obtained for the LL and the HH Ss on the 5 measures taken are presented in Table 13. As can be seen from the Table, the observed rankings are quite similar to those that were expected.

The CNF Ss were most "neurotic" in 6 instances, and the CON Ss were most neurotic on the remaining 4 measures. It should be emphasized, however, that the differences between the CON and the CNF Ss did not approach significance on any of the comparisons made. The NC and the NCP Ss occupy most of the lower rank

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Table 13 Rank-order of Incidence of "Neurosis."

T. activity	CNF, CON, NCP, NC	CNF, CON, NC, NCP
G. activity	CNF, NCP, CON, NC	CNF, CON, NC, NCP
Escape	CON, NCP, CNF, NC	CON, CNF, NC, NCP
Substitutive Rs	CNF, NC, CON, NCP	CNF, CON, NC, NCP
Bizarre Rs	CON, CNF, NCP, NC	CON, NC, CNF, NCP

Thus, the behavior of the NC and the NCP Ss was suppressed more than the behavior of the CON Ss.

The difference expected between the NC and the NCP Ss did not materialize. In fact, there appeared to be a trend in the opposite direction. The NCP Ss were less active than the NC Ss on all of the measures in the LL groups, and on 3 of the 5 measures in the HH groups. It was hypothesized that the NC Ss would exhibit greater response suppression than the NCP Ss. This prediction was based upon the work of Seligman and his associates (Seligman, 1968; Seligman and Meyer, 1970; Seligman, et al., 1969, 1971) who found that signalled shock had a less disruptive effect on behavior than unsignalled shock.

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Seligman (1968) postulated a "safety-signal" hypothesis to explain this effect. According to this hypothesis, Ss exposed to signalled shock are provided with a "warning" signal and are able to predict the occurrence of shock. In addition, the absense of the warning signal functions as a "safety-signal." Ss given signalled shock are reported to be less emotional in the presence of the safety-signal than they are in the presence of the warning signal. On the other hand, Ss exposed to unsignalled shock are not provided with a safety-signal and are, in effect, constantly in the presence of a warning signal. They should, therefore, be more emotional, and less active than "predictably" shocked Ss as emotionality is assumed to suppress behavior (McAlister and McAlister, 1971).

A number of explanations can be forwarded to explain the failure to obtain this effect in the present study. First, the small number of learning trials (3-17) was probably not sufficient to enable the NCP Ss to learn that the absence of the buzzer CS ($\overline{\text{CS}}$) indicated "safety." In his work with rats Seligman (1968) exposed his Ss to 210 CS-US pairings.

Secondly, the inter-trial-intervals seperating successive presentations of the CS and US in the present study were quite short. The temporal distribution of the shock to which the NCP Ss were exposed was determined by the eating behavior of their CON replica

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their CON replication-mates, and the CON Ss did most of their eating within the first few minutes of shock-chamber confinement on Day SH-1. In addition, the duration of the CS was only 10 sec. This meant that the $\overline{CS}$ occurred in close temporal contiguity with the US and may itself have become a "warning" signal.

Third, the buzzer CS employed was fairly intense and was probably aversive. The NCP Ss were, in effect, exposed to a "compound" aversive stimulus (i.e., CS and US) which may have been more unpleasant than shock alone. This could have resulted in more fear and greater response suppression in the NCP Ss relative to the NC Ss.

Finally, the results may have been a function of the responses elicited by the buzzer CS and the US (Bolles, 1969). Fowler (1971) suggested that "distal" aversive stimuli (e.g., visual and auditory inputs) characteristically elicit freezing responses, while "proximal" aversive stimulation such as shock typically elicits flight. If this is true, the decreased activity of the NCP Ss could be a function of persistent freezing responses originally elicited by the buzzer CS. Greater activity would be expected in the NC Ss relative to the NCP Ss as the "species-specific defensive reaction" elicited by shock alone (i.e., by proximal aversive stimulation) is flight or escape (i.e., heightened activity).

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The difference obtained between the groups on the feeding latency measure was the only one supporting the existence of "neurotic" behavior and Masserman's (1943) contentions. The LL CON Ss required significantly more time than the other LL groups of Ss to start eating. This is not surprising, however, and is not necessarily an indication of "neurosis." The CON Ss learned a passive-avoidance response as the result of being punished for eating, and 3 days is not an inordinately long time for such a response to be retained (Brush, 1971).

In addition, the CON Ss were exposed to food while in the shock-chamber on each of the SH days. The remaining groups of Ss had never encountered food in the chamber prior to the test session. Consequently, the introduction of a second container of food did not alter the stimulus situation as drastically for the CON Ss as it did for the Ss in the other groups. Assuming that the feeding inhibitions observed were the result of fear, one would expect longer feeding latencies in the CON Ss. Introduction of food on the test days resulted in greater stimulus generalization decrement in the NC, NCP, and CNF Ss relative to the CON Ss, less fear, and shorter feeding latencies. Thus, the results obtained in the feeding test are also quite easily explained in terms of known learning principles.

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It is interesting to note that Masserman (1943) reported some of his cats starved themselves for periods ranging from 8-22 days following exposure to his treatment. Nothing approaching this period of self-imposed deprivation was observed in the present study. At most, the length of "starvation" lasted only 3 days. In fact, 2 days of deprivation were sufficient to overcome the effects of "conflict" in the HH CON Ss, and all of the Ss in this group ate almost immediately on the first test day (Table 11).

A final point worthy of mention is the possibility that cats do, in fact, become "neurotic" and that the "neurotic" behaviors are responses to confinement and/or food-deprivation. These variables have confounded all of the studies employing Masserman's techniques (Smart, 1965; Wolpe, 1952), including the present effort. The animals in the present investigation were placed on a feeding regimen for 6 days prior to the start of the BLM period, and they may have become "neurotic" during this time. This seems unlikely, however, as the behavior of the Ss did not change over the BLM days. If something akin to "neurosis" was present on Day BLM-1, the "symptoms" should have intensified over the BLM days as a function of increased exposure to confinement and deprivation and the Ss should have been more "neurotic" on Day BLM-5. This obviously was not the case.

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Generally speaking, the results of the present investigation provide no evidence for the existence of "neurotic" behavior in cats following exposure to conflict. Masserman's (1943) findings are best explained as artifacts of the procedures he employed, and those following his lead (Smart, 1965; Wolpe, 1952) committed the same errors and observed the same "neurotic" changes in the behavior of their Ss. There is currently no basis in the literature for the unquestioning acceptance of the phenomenon of "experimental neurosis" in cats evident in certain current psychological works (Manning, 1970; Sarason, 1972).

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APPENDICES

Summary T

APPENDIX A

Summary Tables of the Statistical Analyses

Table A1 LL Act

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A2 HH Ac

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A1 LL Activity, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	46810.69	15603.56	.177
Ss	24	2110644.05	87943.50	
Within Ss				
Days	4	21671.54	5417.89	.910
Days x groups	12	111506.74	9292.23	1.560
Days x Ss	96	571198.52	5949.98	
Total	139	2861831.54		

Table A2 HH Activity, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	43793.57	14597.86	.470
Ss	24	746402.93	31100.12	
Within Ss				
Days	4	75863.48	18890.87	2.633
Days x groups	12	89009.03	7417.42	1.031
Days x Ss	96	689803.93	7185.46	
Total	139	1644572.94		

Table A3 LL Act

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A4 HH Act

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A3 LL Activity, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	350422.90	116807.63	4.733
Ss	24	593071.78	24711.32	
Within Ss				
Days	1	351553.02	351553.02	36.270
Days x groups	3	330163.20	110054.40	11.366
Days x Ss	24	232609.80	9692.08	
Total	55	1857819.98		

Table A4 HH Activity, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	103515.22	34505.07	1.373
Ss	24	604665.71	25194.40	
Within Ss				
Days	1	457568.64	457568.64	27.966
Days x groups	3	173093.07	57697.69	3.533
Days x Ss	24	392728.51	16363.69	
Total	55	1628055.93		

Table A5 LL And

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A6 LL An

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A5 LL And HH Activity, CON Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	18054.31	18054.31	.850
Ss	12	269124.15	22427.01	
Within Ss				
Days	1	72318.88	72318.88	8.011
Days x groups	1	30294.34	30294.34	3.355
Days x Ss	12	108325.28	9027.10	
Total	27	498116.96		

Table A6 LL And HH Activity, NC Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	1068.90	1068.90	.023
Ss	12	537617.71	44801.48	
Within Ss				
Days	1	468790.32	468790.32	29.911
Days x groups	1	4706.03	4706.03	.300
Days x Ss	12	188075.15	15672.93	
Total	27	1200258.11		

Table A7 LL An

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A8 LL An

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A7 LL And HH Activity, NCP Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	40356.03	40356.03	1.475
Ss	12	328113.72	27342.81	
Within Ss				
Days	1	724822.33	724822.33	58.907
Days x groups	1	15698.89	15698.89	1.275
Days x Ss	12	147652.28	12304.36	
Total	27	1256643.25		

Table A8 LL And HH Activity, CNF Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	2214.33	2214.33	.429
Ss	12	61833.42	5152.79	
Within Ss				
Days	1	1170.03	1170.03	.153
Days x groups	1	3680.03	3680.03	.481
Days x Ss	12	91655.44	7637.95	
Total	27	160553.25		

Table A9 LL Ger

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A10 HH G

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A9 LL General Activity, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	154605.16	51535.06	2.063
Ss	24	599456.17	24977.34	
Within Ss				
Days	4	36392.40	9098.10	1.270
Days x groups	12	45430.66	3785.89	.529
Days x Ss	96	687662.54	7163.15	
Total	139	1523546.94		

Table A10 HH General Activity, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	53275.49	17758.50	1.007
Ss	24	423420.52	17642.52	
Within Ss				
Days	4	69388.64	17347.16	6.240
Days x groups	12	24950.44	2079.20	.748
Days x Ss	96	266876.91	2779.97	
Total	139	837913.00		

Table All LL Ge
SD-C.

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A12 HH G
SD-C

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A11 LL General Activity, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	157389.91	52463.30	5.491
Ss	24	229301.71	9554.24	
Within Ss				
Days	1	637.88	637.88	.094
Days x groups	3	76184.34	25394.78	3.714
Days x Ss	24	162928.29	6788.68	
Total	55	626442.13		

Table A12 HH General Activity, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	4458.48	1486.16	.237
Ss	24	150246.86	6260.29	
Within Ss				
Days	1	30039.45	30039.45	4.487
Days x groups	3	21176.91	7058.97	1.139
Days x Ss	24	148737.14	6197.38	
Total	55	354658.84		

Table A13 LL An
And S

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A14 LL A
And

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A13 LL And HH General Activity, CON Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	94129.25	94129.25	14.093
Ss	12	80148.71	6679.06	
Within Ss				
Days	1	2290.39	2290.39	.420
Days x groups	1	8358.89	8358.89	1.532
Days x Ss	12	65481.72	5456.81	
Total	27	250408.96		

Table A14 LL And HH General Activity, NC Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	2962.28	2962.28	.222
Ss	12	159865.14	13322.10	
Within Ss				
Days	1	30624.14	30624.14	4.647
Days x groups	1	5321.29	5321.29	.808
Days x Ss	12	79072.57	79072.57	
Total	27	277845.43		

Table A15 LL A
And

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A16 LL A
And

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A15 LL And HH General Activity, NCP Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	11890.32	11890.32	1.841
Ss	12	77507.14	6458.93	
Within Ss				
Days	1	39450.04	39450.04	4.929
Days x groups	1	3912.89	3912.89	.489
Days x Ss	12	96050.57	8004.21	
Total	27	228810.96		

Table A16 LL And HH General Activity, CNF Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	12558.89	12558.89	2.058
Ss	12	73227.97	6102.30	
Within Ss				
Days	1	24308.04	24308.04	4.734
Days x groups	1	13772.89	13772.89	2.682
Days x Ss	12	61615.57	5134.63	
Total	27	185482.96		

Table A17 LL

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A18 HH

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A17 LL Escape, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	64582.37	21527.46	1.196
Ss	24	435191.77	18132.99	
Within Ss				
Days	4	58986.82	14746.71	3.890
Days x groups	12	22402.38	1866.87	.491
Days x Ss	96	363774.80	3789.32	
Total	139	944938.14		

Table A18 HH Escape, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	58053.67	19351.22	.527
Ss	24	881261.72	36719.24	
Within Ss				
Days	4	86632.34	21658.06	7.374
Days x groups	12	17691.37	1474.28	.501
Days x Ss	96	281947.99	2936.96	
Total	139	1325586.99		

Table A19 LL

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A20 HH

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x grou
Days x Ss
Total

Table A19 LL Escape, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	10020.70	3340.23	1.647
Ss	24	48688.01	2028.67	
Within Ss				
Days	1	2551.49	2551.49	.999
Days x groups	3	14173.52	4724.51	1.851
Days x Ss	24	61247.99	2552.00	
Total	55	136681.71		

Table A20 HH Escape, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	78470.42	26156.81	7.189
Ss	24	87320.58	3638.36	
Within Ss				
Days	1	63922.58	63922.58	28.730
Days x groups	3	68132.79	22710.93	10.208
Days x Ss	24	53391.87	2224.66	
Total	55	244454.50		

Table A21 LL

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A22 LL

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A21 LL And HH Escape, CON Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	1872.89	1872.89	.612
Ss	12	36682.29	3056.86	
Within Ss				
Days	1	514.67	514.67	.106
Days x groups	1	12319.41	12319.41	2.544
Days x Ss	12	58105.42	4842.12	
Total	27	109494.68		

Table A22 LL And HH Escape, NC Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	0.00	0.00	0.000
Ss	12	29566.86	2463.91	
Within Ss				
Days	1	29057.29	29057.29	4.464
Days x groups	1	3300.57	3300.57	.507
Days x Ss	12	78109.14	6509.10	
Total	27	140033.86		

Table A23 LL

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A24 LL

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A23 LL And HH Escape, NCP Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	3235.74	3235.74	1.264
Ss	12	30730.72	2560.89	
Within Ss				
Days	1	31088.89	31088.89	15.258
Days x groups	1	2584.33	2584.33	1.268
Days x Ss	12	24449.28	2037.44	
Total	27	92088.96		

Table A24 LL And HH Escape, CNF Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	217.28	217.28	.217
Ss	12	11984.72	998.73	
Within Ss				
Days	1	448.00	448.00	.499
Days x groups	1	6798.15	6798.15	7.579
Days x Ss	12	10762.85	896.90	
Total	27	30211.00		

Table A25 LL S
1-5

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A26 HH
1-5

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A25 LL Substitutive Behaviors, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	187152.83	62384.28	2.033
Ss	24	736401.31	30683.39	
Within Ss				
Days	4	28898.90	7224.73	1.327
Days x groups	12	75322.81	6276.90	1.153
Days x Ss	96	522328.69	5440.92	
Total	139	1550104.54		

Table A26 HH Substitutive Behaviors, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	143522.38	47840.79	1.194
Ss	24	960868.62	40036.19	
Within Ss				
Days	4	50557.10	12639.28	1.671
Days x groups	12	47590.55	3965.88	.518
Days x Ss	96	725883.95	7561.29	
Total	139	1928422.60		

Table A27 LL S
BLM-

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A28 HH
BLM

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x grou
Days X Ss
Total

Table A27 LL Substitutive Behaviors, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	31800.57	10600.19	.831
Ss	24	305991.29	12749.64	
Within Ss				
Days	1	994.57	994.57	.194
Days x groups	3	117241.72	39080.57	7.164
Days x Ss	24	122732.71	5113.86	
Total	55	578760.86		

Table A28 HH Substitutive Behaviors, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	112520.19	37506.73	3.331
Ss	24	270219.85	11259.16	
Within Ss				
Days	1	19950.87	19950.87	2.106
Days x groups	3	18601.87	6200.36	1.092
Days X Ss	24	136181.86	5674.24	
Total	55	557473.84		

Table A29 LL A
BLM-

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A30 LL
BLM

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A29 LL And HH Substitutive Behaviors, CON Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	7990.32	7990.32	1.355
Ss	12	70755.86	5896.32	
Within Ss				
Days	1	2982.89	2982.89	.356
Days x groups	1	20791.76	20791.76	2.479
Days x Ss	12	100627.85	8385.65	
Total	27	203148.68		

Table A30 LL And HH Substitutive Behaviors, NC Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	13464.14	13464.14	1.993
Ss	12	81076.29	6756.36	
Within Ss				
Days	1	5103.01	5103.01	2.842
Days x groups	1	20.57	20.57	.011
Days x Ss	12	21543.42	1795.29	
Total	27	121207.43		

Table A31 LL An
BIM-N

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A32 LL A
BIM-

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A31 LL And HH Substitutive Behaviors, NCP Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	2161.29	2161.29	.420
Ss	12	61794.14	5149.51	
Within Ss				
Days	1	25925.14	25925.14	5.077
Days x groups	1	120.14	120.14	.024
Days x Ss	12	61270.72	5105.89	
Total	27	151271.43		

Table A32 LL And HH Substitutive Behaviors, CNF Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	3257.29	3257.29	.108
Ss	12	362585.14	30215.43	
Within Ss				
Days	1	1824.14	1824.14	.290
Days x groups	1	20.57	20.57	.003
Days x Ss	12	75472.29	6289.36	
Total	27	443159.43		

Table A33 LL P
BLM

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A34 HH P
BLM

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A33 LL Persistent Bizarre Responses, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	49668.14	16556.05	.174
Ss	24	2278014.68	94917.28	
Within Ss				
Days	4	50764.89	12691.22	3.446
Days x groups	12	68301.33	5691.78	1.545
Days x Ss	96	353590.18	3683.23	
Total	139	2800339.22		

Table A34 HH Persistent Bizarre Responses, All Groups, BLM Days 1-5.

Source	df	SS	MS	F
Among Ss				
Groups	3	88482.70	29494.23	1.143
Ss	24	619417.72	25809.07	
Within Ss				
Days	4	7579.55	1894.89	.380
Days x groups	12	30646.40	2553.87	.513
Days x Ss	96	478368.85	4983.01	
Total	139	1224495.22		

Table A35 LL P
Days

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A36 HH
Day

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A35 LL Persistent Bizarre Responses, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	7849.22	2616.41	.186
Ss	24	336714.28	14029.76	
Within Ss				
Days	1	108064.28	108064.28	13.599
Days x groups	3	11385.29	3795.10	.478
Days x Ss	24	190711.43	7946.31	
Total	55	654724.50		

Table A36 HH Persistent Bizarre Responses, All Groups, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	3	39216.34	13072.11	1.158
Ss	24	271006.71	11291.95	
Within Ss				
Days	1	6710.16	6710.16	1.800
Days x groups	3	20719.48	6906.49	1.852
Days x Ss	24	89487.86	3728.66	
Total	55	427140.55		

Table A37 LL
Days

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x groups
Days x Ss
Total

Table A38 LL
Days

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A37 LL And HH Persistent Bizarre Responses, Con Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	1414.32	1414.32	.060
Ss	12	282388.99	23532.42	
Within Ss				
Days	1	6390.32	6390.32	1.275
Days x groups	1	3235.75	3235.75	.646
Days x Ss	12	60132.72	5011.06	
Total	27	353562.11		

Table A38 LL And HH Persistent Bizarre Responses, NC Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	30426.04	30426.04	3.516
Ss	12	103854.57	8654.55	
Within Ss				
Days	1	20466.04	20466.04	10.171
Days x groups	1	10686.04	10686.04	5.310
Days x Ss	12	24147.43	2012.29	
Total	27	189580.11		

Table A39 LL A
Days

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x group
Days x Ss
Total

Table A40 LL A
Days

Source
Among Ss
Groups
Ss
Within Ss
Days
Days x grou
Days x Ss
Total

Table A39 LL And HH Persistent Bizarre Responses, NCP Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	720.43	720.43	.071
Ss	12	122337.71	10194.81	
Within Ss				
Days	1	70601.29	70601.29	7.906
Days x groups	1	6180.57	6180.57	.692
Days x Ss	12	107159.14	8929.93	
Total	27	306998.86		

Table A40 LL And HH Persistent Bizarre Responses, CNF Ss, Days BLM-M And SD-C.

Source	df	SS	MS	F
Among Ss				
Groups	1	1972.32	1972.32	.251
Ss	12	54455.45	7871.29	
Within Ss				
Days	1	3322.32	3322.32	.536
Days x groups	1	20900.89	20900.89	3.370
Days x Ss	12	74412.29	6201.02	
Total	27	195063.25		

Table A41 F

Source
Condition
Groups
Condition x g
Error
Total

Table A42 Fe

Source
Condition
Groups
Condition x g
Error
Total

Table A41 Feeding Latencies, LL And HH Groups.

Source	df	SS	MS	F
Condition	1	344929.018	344929.018	5.313
Groups	3	719692.053	239897.351	3.695
Condition x groups	3	723519.625	241173.208	3.715
Error	48	3116004.286	64916.756	
Total	55	4904144.982		

Table A42 Feeding Time, LL And HH Groups.

Source	df	SS	MS	F
Condition	1	73153.143	73153.143	3.004
Groups	3	11067.000	11067.000	.454
Condition x groups	3	10445.286	3481.762	.143
Error	48	1169034.286	24354.881	
Total	55	1285833.710		

The

APPENDIX B

The "Behavior Checklist" and Checklist Data for Individual Ss

A. ATTRACTION

0 Avoids
1 Indiff
2 Occasi
approa
3 Intere
observ
4 Watche
5 Active

B. REACTION T

0 Active
1 Select
2 Indiff
3 No res
5 Active

C. ATTRACTION

0 Violen
1 Agitat
2 Restle
3 Immobi
4 Indiff
5 Readil

D. ESCAPE BEH

0 Energe
1 Invari
2 May le
3 Indiff
4 Active

E. NEUROTIC H

0 Respor
1 Alert,
2 Over-a
3 Occasi
5 Markec

THE "BEHAVIOR CHECKLIST"

A. ATTRACTION TO CAGED MICE.

0 Avoids or phobic to mice (retreats, moves away).
1 Indifferent to mice (no approach or retreat).
2 Occasional desultory observation (few glances, no approach).
3 Interested but easily distracted (approach, sporadic observation).
4 Watches intently (attention, no attempt to capture).
5 Active attempts to capture (claws or bites).

B. REACTION TO EXPERIMENTER.

0 Active resistance to handling (struggles, hisses).
1 Selective hostilities.
2 Indifferent, avoids handling.
3 No resistance to handling, but not seeking petting.
5 Actively seeks petting and handling.

C. ATTRACTION TO APPARATUS.

0 Violently resists entry to cage.
1 Agitated in cage, paces.
2 Restless, paces or seeks release.
3 Immobile.
4 Indifferent to entry or confinement.
5 Readily seeks to enter and remain.

D. ESCAPE BEHAVIOR.

0 Energetically tries to force escape.
1 Invariably leaves cage when permitted (all 3 openings).
2 May leave or remain when door is open (1-2 openings).
3 Indifferent to escape (no escape on any opening).
4 Actively resists removal from cage.

E. NEUROTIC HYPERSENSITIVITY.

0 Response focussed on situation.
1 Alert, but not distractable.
2 Over-alert, distractable.
3 Occasional generalized startle.
5 Marked phobias; crouching, panic, etc.

F. NEUROTIC M

0 No mot
1 Hypera
day).
1 Hypoac
day).
3 Immobi
5 Convul
5 Catale

G. AUTONOMIC

0 None
1 Horri
3 Trembl
retchi
5 Vomiti

H. SUBSTITUTI

0 None.
1 Preen
3 Devia
5 Persi
vocal

I. REACTION

0 Avoid
1 Indif
2 Occas
3 Inter
4 Watch
5 Activ

F. NEUROTIC MOTOR DISTURBANCE.

0 No motor disturbance.
1 Hyperactive (activity more than 25% above previous day).
1 Hypoactive (activity more than 25% below previous day).
3 Immobility (no movement for more than ½ of session).
5 Convulsions.
5 Catalepsy (waxy rigidity of the limbs).

G. AUTONOMIC CHANGES.

0 None grossly observed.
1 Horripilation, mydriasis.
3 Trembling, irregular breathing, excessive salivation, retching.
5 Vomiting, urination, defecation.

H. SUBSTITUTIVE BEHAVIOR.

0 None.
1 Preening, playing.
3 Deviant responses (excessive clawing, pacing).
5 Persistent bizarre responses (e.g., continuous loud vocalizing).

I. REACTION TO MANIPULANDUM.

0 Avoids or phobic to manipulandum.
1 Indifferent to manipulandum.
2 Occasional glances, no approach.
3 Interested, but easily distracted.
4 Watches intently.
5 Active manipulation.

Condition: LL

Measure:

A
B
C
D
E
F
G
H
I

Minute:

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9
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Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL   Group: CON   Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	3	2	3	2	2	2
C	2	2	2	2	2	2	2	2
D	2	1	1	1	1	1	2	1
E	0	1	1	1	1	0	1	1
F	–	1	3	4	4	4	4	2
G	0	0	0	0	0	0	0	0
H	0	3	1	1	1	1	1	1
I	5	5	1	1	1	1	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	17	19	22	25	22	0	2	4
2	20	9	20	26	21	0	6	6
3	21	5	17	17	11	0	5	4
4	20	6	11	18	8	4	4	6
5	19	7	15	20	11	3	7	3
6	12	4	4	17	13	7	4	0
7	11	11	7	7	13	4	4	2
8	2	2	10	13	12	0	6	2
9	7	6	12	18	5	0	4	5
10	8	0	0	18	3	3	8	6
Total:	137	69	118	179	119	21	50	38

Number of Shocks: 14

Feeding Latency: 5 sec.

Feeding Time: 250 sec.

Condition: LL

Measure:

A

B

C

D

E

F

G

H

I

Minute:

1

2

3

4

5

6

7

8

9

10

Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL Group: NC Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	3	2	2	2	2
C	2	2	2	2	1	2	2	2
D	2	1	1	1	2	1	1	1
E	0	0	1	1	1	1	1	1
F	-	2	1	1	1	4	4	4
G	0	0	0	0	0	0	0	0
H	1	1	1,3	1	1	0	0	0
I	3	5	1	5	1	5	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	27	11	22	25	20	10	0	0
2	27	9	24	27	26	13	5	0
3	26	9	23	20	24	0	3	0
4	19	16	24	20	18	0	2	0
5	21	19	13	18	22	14	3	0
6	11	16	18	26	17	13	2	0
7	14	5	15	22	3	19	7	0
8	15	0	21	7	18	18	12	0
9	12	0	27	7	11	0	0	0
10	15	0	15	14	18	4	0	0
Total:	187	85	202	186	177	91	34	0

Number of Shocks: 14

Feeding Latency: 5 sec.

Feeding Time: 290 sec.

Condition: LL

Measure:

A
B
C
D
E
F
G
H
I

Minute:

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4
5
6
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8
9
10

Total:

Number of Shoc

Feeding Latenc

Feeding Time:

Condition: LL   Group: NCP   Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	2	1	1	1
B	2	2	3	2	2	2	2	2
C	2	2	2	2	2	2	2	3
D	2	2	1	1	1	3	2	3
E	1	1	1	0	1	3	1	1
F	–	1	3	2	1	4	4	4
G	0	0	0	0	0	3	0	0
H	1	1	1	1	1,3	0	0	0
I	1	5	5	5	5	1	5	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	24	10	20	4	7	0	0	0
2	23	6	14	9	13	0	0	0
3	23	0	8	15	5	0	0	0
4	26	3	13	12	3	0	0	0
5	18	0	6	12	5	0	0	0
6	24	0	4	7	1	0	0	0
7	20	0	5	9	2	0	0	0
8	17	0	3	4	2	0	0	0
9	23	8	3	15	0	0	0	0
10	23	0	4	9	5	0	0	0
Total:	221	27	80	96	43	0	0	0

Number of Shocks: 14

Feeding Latency: 7 sec.

Feeding Time: 120 sec.

Condition: LL

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
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4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL Group: CNF Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	2	2	2	2	1	2
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	1	2	2	2	1	3	3	2
E	1	1	1	1	1	1	1	1
F	–	1	1	1	1	1	1	1
G	0	0	0	0	0	0	0	0
H	1	1	1,3	1,3	1	1	1	1
I	5	5	5	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	13	7	19	17	14	6	18	13
2	12	9	14	8	16	10	13	15
3	7	8	8	11	12	7	15	11
4	0	11	13	6	11	10	12	9
5	0	9	11	5	9	13	11	7
6	0	12	14	9	9	16	8	11
7	5	10	9	12	10	13	11	12
8	4	7	5	13	11	9	17	10
9	8	7	10	16	14	13	14	12
10	6	12	16	11	12	17	10	8
Total:	55	92	119	108	118	114	129	118

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 170 sec.

Condition: LI

Measure:

A
B
C
D
E
F
G
H
I

Minute:

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Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL Group: CON Litter: 2

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	3	3	2	3	3	3	3	3
E	1	1	1	1	1	1	1	1
F	-	1	1	1	1	3	2	1
G	0	0	0	0	0	0	0	0
H	1	1,3	1,3	1,3	1,3	1	1	1
I	5	5	5	5	5	1	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	6	12	9	6	0	0	4	8
2	10	14	10	9	7	0	6	11
3	9	10	14	9	6	3	0	5
4	9	11	10	6	6	0	2	7
5	9	6	6	3	2	0	3	10
6	7	0	8	2	2	0	4	0
7	8	4	2	11	0	0	5	5
8	9	12	0	1	1	2	5	6
9	10	13	0	7	0	0	1	8
10	11	11	3	4	1	0	0	4
Total:	88	93	62	58	25	5	30	64

Number of Shocks: 12

Feeding Latency: 1225 sec.

Feeding Time: 365 sec.

Condition: LL

Measure:

A
B
C
D
E
F
G
H
I

Minute:

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6
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8
9
10

Total:

Number of Shoc

Feeding Latenc

Feeding Time:

Condition: LL Group: NC Litter: 2

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	3	2	2	2	2
C	2	2	1	2	2	2	3	3
D	1	1	1	1	1	1	1	1
E	1	1	1	1	1	1	1	1
F	–	2	1	3	2	4	4	4
G	0	0	0	0	0	0	1	0
H	5	3	1	1	1	1	1	1
I	1	1	1	0	1	0	1	1

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	2	0	4	0	0	0	0	0
2	7	5	13	0	0	0	0	0
3	5	1	5	2	0	0	0	0
4	13	0	2	2	0	0	0	0
5	9	0	0	0	0	0	0	0
6	18	0	0	2	0	0	0	0
7	5	0	4	1	0	0	0	0
8	6	0	3	1	0	0	0	0
9	5	0	3	3	0	0	0	0
10	7	0	0	2	0	0	0	0
Total:	77	1	34	13	0	0	0	0

Number of Shocks: 12

Feeding Latency: 5 sec.

Feeding Time: 760 sec.

Condition: L

Measure:

A
B
C
D
E
F
G
H 1
I

Minute:

1
2
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4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL Group: NCP Litter: 2

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	3	2	2	2	2	2
C	2	2	2	2	2	2	3	2
D	3	3	3	3	3	3	3	3
E	1	1	1	1	1	1	1	1
F	-	1	3	2	1	4	4	4
G	0	0	0	0	0	1,3	3	0
H	1,3	1,3	1,3	1,3	1,3	0	0	1
I	5	5	5	5	5	1	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	10	5	9	3	9	0	0	0
2	7	4	6	11	14	0	1	0
3	9	7	8	13	1	0	0	0
4	17	3	7	23	7	0	0	0
5	11	8	7	7	3	0	0	0
6	10	8	7	4	6	0	0	0
7	22	5	4	2	2	0	0	0
8	6	6	6	2	3	0	0	0
9	15	2	6	7	10	0	0	0
10	6	11	12	6	7	0	0	0
Total:	113	59	72	78	62	0	1	0

Number of Shocks: 12

Feeding Latency: 5 sec.

Feeding Time: 700 sec.

Condition: I

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Later

Feeding Time:

Condition: LL Group: CNF Litter: 2

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	2	1	1	1	1	1	1	1
B	2	2	2	3	2	2	2	2
C	2	2	2	2	2	2	2	2
D	3	3	2	1	1	1	1	1
E	1	1	1	1	1	1	1	1
F	–	2	2	3	3	4	2	1
G	0	0	0	0	0	0	0	0
H	1	1	1	1	1	1	1	1
I	1	2	1	1	1	1	1	5

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	0	2	9	10	7	0	2	11
2	0	0	1	5	5	2	1	15
3	3	0	1	15	6	0	8	6
4	5	0	0	7	3	0	6	0
5	0	0	0	1	1	0	2	4
6	2	1	2	1	0	0	3	8
7	2	1	0	0	0	0	1	8
8	0	1	3	0	0	0	0	3
9	0	0	3	1	0	0	0	1
10	0	0	1	0	0	0	0	0
Total:	12	5	27	40	22	2	23	56

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 465 sec.

Condition: LI

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Later

Feeding Time:

Condition: LL Group: CON Litter: 3

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	3	3	3	3	3	3	3	3
E	3	1	1	1	2	1	1	1
F	-	1	1	1	1	3	2	1
G	0	0	0	0	0	0	0	0
H	1	1	1	1,3	1,3	1,3	1,3	1,3
I	5	5	5	5	5	3	5	2

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	14	16	14	11	16	0	6	11
2	21	9	12	18	17	0	6	11
3	18	12	18	15	12	6	10	9
4	16	14	14	14	17	7	9	11
5	16	14	12	15	16	1	7	11
6	13	0	10	12	13	10	11	9
7	13	9	15	13	16	7	6	6
8	7	10	15	18	11	0	10	9
9	11	15	12	16	14	0	15	11
10	17	8	16	12	11	0	9	0
Total:	146	107	138	144	143	31	89	88

Number of Shocks: 8

Feeding Latency: 1405 sec.

Feeding Time: 340 sec.

Condition: L

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
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4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL   Group: NC   Litter: 3

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	2	1	1	1	1	1	1
B	2	2	0	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	3	2	2	1	2	2	2	1
E	1	1	1	1	1	1	1	1
F	-	1	1	1	1	4	4	4
G	0	0	0	0	0	1	0	0
H	1,3	1,3	1,3	1,3	1,3	0	0	1,3
I	5	5	5	5	5	1	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	5	9	14	14	12	1	1	2
2	7	9	10	4	9	1	0	1
3	7	12	13	20	11	2	4	0
4	10	8	12	10	9	0	1	2
5	10	9	11	11	12	0	0	3
6	6	9	8	14	4	0	2	4
7	8	4	9	11	9	0	0	4
8	11	9	11	14	4	0	3	10
9	9	8	7	7	9	0	2	9
10	11	8	6	14	10	0	0	3
Total:	84	85	101	119	89	4	13	38

Number of Shocks: 8

Feeding Latency: 10 sec.

Feeding Time: 370 sec.

Condition: Ll

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL   Group: NCP   Litter: 3

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	1	2
D	3	2	1	1	1	1	3	1
E	1	1	1	1	1	1	1	1
F	–	1	1	1	1	4	4	4
G	0	0	0	0	0	1	1,3	0
H	1	1,3	1,3,5	1,3	1,3	0	0	1
I	2	5	1	1	1	1	2	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	5	14	15	16	10	0	0	0
2	12	12	8	13	11	0	0	0
3	5	9	10	10	1	0	0	0
4	14	7	7	8	3	0	0	0
5	8	10	15	12	5	0	0	0
6	6	7	10	6	5	0	0	0
7	8	9	6	12	4	0	0	0
8	7	6	12	7	4	0	0	0
9	10	6	10	0	7	0	0	0
10	9	11	11	4	3	0	0	0
Total:	84	91	104	88	53	0	0	0

Number of Shocks: 8

Feeding Latency: 5 sec.

Feeding Time: 325 sec.

Condition: L

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL Group: CNF Litter: 3

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	3	2	2	2	2	2	2
D	3	3	2	2	1	3	3	3
E	1	1	1	1	1	1	1	1
F	–	3	2	1	1	2	1	1
G	0	0	0	0	0	0	0	0
H	1	0	1	1	0	1	0	0
I	5	5	5	2	5	3	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	1	0	19	28	23	9	7	17
2	10	0	13	22	24	10	6	10
3	11	0	28	13	17	9	16	8
4	17	0	15	9	15	2	16	3
5	15	0	0	8	18	6	13	6
6	16	2	15	17	12	2	17	7
7	14	0	15	11	17	3	14	6
8	4	0	22	17	14	4	10	1
9	3	3	18	20	14	20	10	2
10	3	6	29	24	12	16	10	6
Total:	94	11	174	169	166	81	119	66

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 565 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Laten

Feeding Time:

Condition: LL   Group: CON   Litter: 4

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	0	2	2	2	2	2
C	3	2	2	2	2	2	2	2
D	3	3	3	3	2	2	2	2
E	1	0	1	1	1	1	1	1
F	-	1	1	1	1	1	1	1
G	0	0	0	0	0	0	0	0
H	1	1	1,3	1	1,3	1	1	1
I	5	5	5	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	2	4	7	10	0	7	7
2	0	6	6	2	14	2	6	10
3	0	4	0	9	10	2	4	14
4	4	3	3	7	12	8	7	6
5	0	3	3	4	2	10	9	3
6	0	3	5	7	5	2	7	2
7	4	0	0	9	7	8	12	4
8	2	0	0	5	6	4	10	10
9	0	2	4	6	2	6	4	4
10	0	3	1	6	2	5	4	4
Total:	10	26	26	62	70	47	70	64

Number of Shocks: 6

Feeding Latency: 5 sec.

Feeding Time: 260 sec.

Condition: 1

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Later

Feeding Time:

Condition: LL   Group: NC   Litter: 4

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	2	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	3	2	2	3	2	2	3	3
E	2	1	1	1	1	1	1	1
F	-	1	1	1	1	3	1	1
G	0	0	0	0	0	0	0	0
H	1	1	1,3	1	1	0	1	0
I	5	5	5	5	5	5	5	5

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	1	7	7	12	5	0	10	15
2	5	9	16	6	11	11	14	4
3	11	20	9	0	12	10	6	5
4	15	21	10	7	16	6	8	0
5	7	20	17	4	6	6	12	0
6	4	8	8	2	10	12	6	2
7	15	5	7	4	11	3	4	1
8	3	5	17	6	6	1	6	9
9	8	4	8	6	13	8	7	3
10	18	6	9	2	13	15	5	12
Total:	87	105	108	49	103	72	78	51

Number of Shocks: 6

Feeding Latency: 15 sec.

Feeding Time: 295 sec.

Condition: LI

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Later

Feeding Time:

Condition: LL Group: NCP Litter: 4

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	3	2	2	2	2	2	3	3
D	3	3	3	2	3	3	3	3
E	1	1	1	1	1	1	1	1
F	-	2	1	1	1	4	4	4
G	3	0	0	0	0	0	0	0
H	0	1	1	1	1	0	0	0
I	1	5	5	5	5	2	5	5

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	0	0	0	2	2	0	0	0
2	0	0	0	4	4	0	0	0
3	0	0	0	3	5	0	0	0
4	0	0	0	2	0	0	0	0
5	0	0	0	0	5	0	0	0
6	0	0	0	0	8	0	0	0
7	0	0	0	1	1	0	0	0
8	0	0	0	0	2	0	0	0
9	0	0	0	0	4	0	0	0
10	0	0	0	0	1	0	0	0
Total:	0	0	0	12	32	0	0	0

Number of Shocks: 6

Feeding Latency: 5 sec.

Feeding Time: 320 sec.

Condition: I

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: CNF Litter: 4

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	3	2	2	2	2
C	2	3	4	4	4	4	4	4
D	3	3	3	3	3	3	3	3
E	2	2	1	1	1	1	1	1
F	–	3	3	2	1	2	1	1
G	0	0	0	0	0	0	0	0
H	1	1	1	1	1	1	1	1
I	5	1	1	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
Total:	0	0	0	0	0	0	0	0

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 515 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: CON Litter: 5

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	2	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	3	2	1	2	3	2	3	2
E	1	1	1	1	1	1	1	1
F	-	1	1	1	1	1	1	1
G	0	0	0	0	0	0	0	0
H	1,3	1	1,3	1	1,3	1	1	1,3
I	5	5	5	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	6	8	8	15	8	2	2	2
2	1	9	5	6	7	8	9	0
3	3	6	5	6	2	14	0	1
4	4	11	2	1	4	22	0	0
5	3	4	0	11	0	17	4	0
6	0	4	0	4	0	13	2	0
7	13	3	3	4	0	4	0	0
8	5	3	6	0	0	5	0	0
9	0	2	4	5	0	3	0	0
10	0	0	1	7	1	0	0	0
Total:	38	50	34	59	22	88	17	3

Number of Shocks: 10

Feeding Latency: 10 sec.

Feeding Time: 270 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: NC Litter: 5

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	3
D	1	1	1	1	1	1	2	3
E	1	1	1	1	1	1	1	1
F	-	1	1	1	1	3	1	1
G	0	0	0	0	0	0	0	0
H	1,3	1,5	1,3	1,3	1,3	1,3	1	1,3
I	5	5	5	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	15	15	15	10	4	1	0	1
2	26	10	8	7	6	0	0	1
3	26	8	3	8	11	0	4	5
4	21	13	4	5	6	0	1	3
5	14	7	6	6	3	6	3	0
6	16	12	15	6	5	16	4	1
7	29	13	2	0	6	13	7	3
8	11	9	13	4	8	6	0	5
9	21	9	4	5	6	5	0	6
10	14	3	9	1	7	0	0	3
Total:	193	99	79	52	62	47	19	28

Number of Shocks: 10

Feeding Latency: 5 sec.

Feeding Time: 270 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: NCP Litter: 5

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	3	2
D	1	1	2	1	3	1	3	1
E	1	1	1	1	1	2	1	1
F	–	1	1	1	1	4	4	4
G	0	1	0	0	0	3	0	0
H	1,3	1	1,3	1,3	1,3	0	0	1
I	5	5	5	3	3	1	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	2	10	1	2	0	0	0	0
2	8	8	1	3	0	3	0	0
3	5	4	1	3	0	0	0	0
4	2	8	0	2	0	0	0	0
5	4	0	0	2	0	0	0	0
6	7	5	0	3	0	0	0	0
7	3	3	0	1	0	0	0	0
8	1	2	0	0	0	0	0	0
9	9	5	1	0	0	0	0	0
10	4	4	1	0	0	3	0	0
Total:	45	49	5	16	0	6	0	0

Number of Shocks: 10

Feeding Latency: 5 sec.

Feeding Time: 240 sec.

Condition: I

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Late

Feeding Time

Condition: LL Group: CNF Litter: 5

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	2	2	1	2	1	1
B	2	2	3	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	2	2	2	2	1	1	3	3
E	1	2	1	0	1	1	1	1
F	–	1	3	1	1	2	1	1
G	0	0	0	0	0	0	0	0
H	1	1	1	1	1	1	1	1
I	2	5	1	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	24	14	12	20	14	2	8	2
2	24	15	10	26	15	19	13	7
3	11	7	6	17	23	10	4	4
4	17	3	6	9	6	8	3	2
5	14	2	0	18	17	14	0	4
6	11	0	4	8	13	13	3	3
7	10	0	4	2	0	10	2	2
8	15	0	1	18	1	9	1	3
9	11	1	3	15	4	4	1	1
10	10	5	7	0	14	8	2	3
Total:	147	47	53	133	107	97	37	31

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 240 sec.

Condition: L

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sho

Feeding Later

Feeding Time:

Condition: LL Group: CON Litter: 6

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	2	3	2	3	2	2	-
C	1	1	2	2	2	2	2	-
D	1	1	1	1	1	1	1	-
E	1	0	1	0	1	1	1	-
F	-	1	1	1	1	3	2	-
G	0	0	0	0	0	0	0	-
H	5	5	0	0	1	0	1	-
I	1	1	1	1	5	5	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	36	27	20	19	16	1	7	-
2	39	27	24	20	10	3	19	-
3	37	30	24	23	5	13	12	-
4	36	28	24	24	13	11	19	-
5	37	30	24	24	0	6	23	-
6	39	28	20	23	4	5	20	-
7	37	30	25	18	16	17	21	-
8	33	30	14	21	14	16	10	-
9	41	31	13	28	13	22	12	-
10	40	32	2	22	12	9	6	-
Total:	375	293	190	222	103	103	149	-

Number of Shocks: 7

Feeding Latency: 1213 sec.

Feeding Time: 270 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: NC Litter: 6

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	2	3	3	3	2	2	-
C	1	1	2	2	2	2	2	-
D	1	1	1	1	1	1	1	-
E	1	1	1	0	1	1	1	-
F	-	1	1	1	1	3	4	-
G	0	0	0	0	0	0	0	-
H	5	5	1	1	1	5	1	-
I	1	1	1	1	1	2	1	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	34	39	34	32	22	37	19	-
2	37	41	30	36	23	33	13	-
3	33	38	32	32	25	29	10	-
4	40	37	20	33	21	29	11	-
5	36	24	23	34	20	18	12	-
6	38	38	26	33	19	25	17	-
7	34	39	22	29	17	27	15	-
8	35	40	21	34	23	29	17	-
9	36	38	20	37	22	29	13	-
10	44	25	24	27	33	34	16	-
Total:	367	359	252	327	225	280	141	-

Number of Shocks: 7

Feeding Latency: 605 sec.

Feeding Time: 260 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: NCP Litter: 6

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	2	3	3	3	2	2	-
C	4	4	2	2	2	2	2	-
D	3	3	3	2	2	1	1	-
E	1	2	1	1	1	3	3	-
F	-	2	3	2	1	4	4	-
G	0	0	0	0	0	3	0	-
H	0	1	1	1	1	0	0	-
I	1	5	5	5	5	2	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	4	7	8	3	1	-
2	0	0	6	9	4	3	4	-
3	0	0	5	12	3	2	2	-
4	0	0	9	4	2	0	0	-
5	0	0	3	0	9	1	5	-
6	0	0	4	3	5	6	5	-
7	0	0	0	8	6	4	3	-
8	0	0	0	3	2	3	3	-
9	0	0	0	3	5	6	0	-
10	0	0	6	8	8	4	0	-
Total:	0	0	37	57	52	32	23	-

Number of Shocks: 7

Feeding Latency: 10 sec.

Feeding Time: 365 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: CNF Litter: 6

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	2	1	1	1	1	1	–
B	2	2	2	3	2	2	2	–
C	2	2	2	2	2	2	2	–
D	3	3	3	2	2	3	1	–
E	3	1	1	1	1	2	1	–
F	–	1	1	1	1	1	1	–
G	0	0	0	0	0	0	0	–
H	1,3	1,3	1,3	1,3	1	1	1	–
I	5	0	5	5	5	5	5	–

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	0	0	10	11	4	0	0	–
2	0	1	6	10	4	0	0	–
3	7	0	13	14	1	0	6	–
4	4	9	10	13	1	5	0	–
5	13	6	9	7	0	1	0	–
6	9	4	4	12	3	0	0	–
7	9	2	5	6	0	0	0	–
8	7	5	5	8	0	7	0	–
9	0	0	2	2	1	0	0	–
10	2	0	4	3	3	0	0	–
Total:	51	27	68	86	17	13	6	–

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 310 sec.

Condition: I

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL   Group: CON   Litter: 7

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	0
C	2	2	2	2	2	2	2	2
D	1	1	2	2	3	1	2	2
E	1	0	1	1	1	1	1	1
F	–	1	1	1	1	4	2	1
G	0	0	0	0	0	0	0	0
H	1,3	1,3	1,3	1,3	1,3	1	1	1
I	5	5	5	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	21	18	12	19	7	0	0	1
2	21	22	13	14	3	0	0	2
3	25	15	10	17	7	0	0	2
4	25	13	9	13	0	0	1	5
5	16	18	6	7	4	0	1	3
6	12	14	14	16	1	0	0	1
7	20	20	8	15	0	0	0	0
8	18	18	12	10	1	0	1	1
9	20	11	3	11	0	0	4	2
10	28	28	9	8	0	0	2	3
Total:	206	177	96	130	23	0	9	20

Number of Shocks: 13

Feeding Latency: 5 sec.

Feeding Time: 210 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: NC Litter: 7

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	3	3	3	2	3	3	3	2
E	1	1	1	1	1	1	1	1
F	-	1	2	1	1	4	4	4
G	0	0	0	0	0	3	0	0
H	1,3	1,3	1	1,3	1,3	0	0	0
I	5	5	5	5	5	3	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	25	32	22	30	19	0	9	4
2	25	20	22	23	17	0	10	2
3	14	20	18	23	15	0	0	2
4	18	30	23	25	17	0	0	0
5	20	13	18	22	17	0	0	1
6	9	15	16	23	14	0	0	0
7	19	7	16	16	19	0	0	0
8	21	8	22	13	16	0	0	0
9	21	16	20	9	18	0	0	0
10	10	6	18	6	5	0	0	1
Total:	182	167	195	190	157	0	19	10

Number of Shocks: 13

Feeding Latency: 5 sec.

Feeding Time: 255 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: NCP Litter: 7

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	1	1	2	2	2	3	2	2
C	2	2	2	2	2	2	2	2
D	2	1	2	1	1	2	2	2
E	1	1	1	1	0	1	1	1
F	–	4	4	4	2	4	4	4
G	0	0	0	0	0	0	0	0
H	1,3	1	1	1	1	1	1,3	1
I	3	3	5	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	0	2	9	0	0	0
2	0	7	3	11	17	0	0	0
3	0	6	9	9	14	0	0	0
4	3	15	13	7	11	0	0	0
5	8	11	12	13	16	0	0	0
6	4	13	14	15	14	2	0	0
7	11	16	12	19	17	0	0	0
8	16	15	16	15	11	3	0	0
9	14	10	10	21	13	1	0	0
10	9	7	17	13	10	0	0	0
Total:	63	100	106	125	142	6	0	0

Number of Shocks: 13

Feeding Latency: 5 sec.

Feeding Time: 235 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: LL Group: CNF Litter: 7

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	2	1	1	1	1	1	1	1
E	1	1	1	1	1	1	1	1
F	-	1	1	1	1	1	3	1
G	0	0	0	0	0	0	0	0
H	1	1	1	1	1	1	1	1
I	5	5	5	5	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	6	9	3	4	6	2	2
2	0	5	2	5	2	2	1	2
3	3	7	4	4	0	1	0	1
4	3	2	5	0	3	0	0	1
5	3	0	3	0	0	1	0	0
6	0	2	4	3	0	4	2	0
7	1	0	0	3	0	4	2	0
8	0	1	1	0	5	4	0	0
9	2	0	3	4	4	0	2	0
10	0	1	4	3	0	1	0	0
Total:	12	24	35	25	18	21	8	6

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 295 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sl

Feeding Lat

Feeding Tim

Condition: HH Group: CON Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	1
B	2	2	2	2	2	2	2	2
C	2	2	2	2	2	2	2	2
D	1	3	1	1	3	3	3	3
E	1	0	1	1	1	1	1	1
F	–	1	1	3	2	3	2	1
G	0	0	0	0	0	1	0	3
H	5	3	3,5	3	5	1	3	5
I	0	0	0	0	1	1	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	1	12	0	3	2	0	3
2	0	0	15	2	6	1	2	8
3	0	1	3	0	2	0	0	0
4	0	0	1	3	1	4	3	7
5	4	0	3	0	1	0	8	5
6	2	0	7	0	2	0	0	1
7	3	0	4	0	0	0	3	4
8	0	1	7	6	7	1	2	4
9	0	2	2	0	0	1	2	1
10	0	0	0	2	0	2	2	0
Total:	9	5	54	13	22	11	22	33

Number of Shocks: 7

Feeding Latency: 5 sec.

Feeding Time: 150 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of Sh

Feeding Late

Feeding Time

Condition: HH   Group: NC   Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	2	1	1	1	1	1	1
B	2	2	1	3	2	2	2	2
C	2	4	2	2	4	2	3	2
D	2	3	2	3	3	3	3	3
E	1	1	1	1	1	1	1	1
F	–	1	1	1	1	4	2	4
G	0	0	0	0	0	0	0	3
H	1	1	1	0	1	0	0	0
I	4	4	5	5	5	1	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	7	0	9	8	10	2	0	0
2	3	0	11	2	2	2	10	0
3	3	0	13	3	1	2	1	0
4	0	0	1	5	1	8	4	0
5	0	0	4	1	0	4	5	0
6	0	0	0	5	0	3	10	0
7	1	3	0	1	0	0	13	0
8	0	4	1	1	0	2	12	0
9	0	4	0	4	4	1	6	0
10	3	3	1	2	4	6	2	0
Total:	17	14	40	32	22	30	63	0

Number of Shocks: 7

Feeding Latency: 5 sec.

Feeding Time: 137 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of S

Feeding Lat

Feeding Tim

Condition: HH Group: NCP Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	1	1	1	1	1	1	1
B	3	2	1	1	3	2	2	2
C	2	2	2	2	2	2	2	2
D	1	1	1	1	1	1	2	1
E	0	0	1	1	1	3	2	1
F	-	1	1	1	1	4	2	1
G	0	0	0	0	0	0	0	3
H	1	1	1	3	3	0	5	3
I	2	5	5	5	5	3	1	1

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	4	4	9	4	2	0	4	0
2	6	3	13	3	2	2	6	3
3	4	4	7	2	3	0	11	1
4	2	1	6	3	1	0	10	5
5	2	4	3	4	3	11	9	3
6	3	1	8	4	2	0	9	1
7	3	3	4	2	1	0	15	3
8	3	2	3	2	1	0	15	4
9	2	2	2	5	0	0	14	2
10	3	0	3	2	1	0	11	2
Total:	32	24	58	31	16	13	103	24

Number of Shocks: 7

Feeding Latency: 5 sec.

Feeding Time: 123 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: CNF Litter: 1

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	2	1	1	2	1
B	2	2	2	3	3	3	2	2
C	4	4	4	4	4	4	2	4
D	2	1	2	2	3	3	2	2
E	1	2	1	1	1	1	1	1
F	-	2	1	1	1	1	2	1
G	0	0	0	0	0	0	0	0
H	1	1	1	1	1	1	1	1
I	5	5	5	4	5	5	5	5

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	4	3	0	4	0	3	0
2	0	7	3	0	6	11	9	6
3	3	0	6	7	1	8	7	7
4	3	0	1	3	0	3	0	4
5	7	1	1	0	3	0	4	2
6	0	6	0	0	3	4	0	1
7	0	1	0	4	2	7	0	0
8	0	1	0	1	1	1	6	3
9	1	0	0	1	1	4	5	1
10	6	0	0	0	0	0	0	0
Total:	20	20	14	16	21	38	34	24

Number of Shocks: 7

Feeding Latency: 5 sec.

Feeding Time: 290 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of S

Feeding Lat

Feeding Tim

Condition: HH Group: CON Litter: 2

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	–
B	3	3	1	2	2	2	2	–
C	2	2	2	2	2	2	2	–
D	1	2	2	2	1	3	2	–
E	1	1	1	1	1	1	1	–
F	–	1	1	1	1	1	2	–
G	3	0	0	0	0	0	0	–
H	1	3	1	1	3	3	5	–
I	5	5	5	5	5	2	5	–

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	8	8	5	13	4	0	0	–
2	6	2	5	6	1	0	0	–
3	3	2	3	6	4	2	4	–
4	5	4	3	0	0	0	2	–
5	6	1	1	0	0	2	2	–
6	2	1	2	5	0	0	2	–
7	1	3	7	8	0	2	7	–
8	5	3	3	0	3	2	3	–
9	10	1	5	0	1	3	3	–
10	5	1	0	7	3	2	0	–
Total:	51	26	34	45	16	13	23	–

Number of Shocks: 8

Feeding Latency: 7 sec.

Feeding Time: 130 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of S

Feeding Lat

Feeding Tim

Condition: HH Group: NC Litter: 2

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	2	–
B	3	2	2	2	2	2	2	–
C	2	2	2	2	2	2	2	–
D	2	2	4	3	3	3	3	–
E	1	1	1	1	1	3	1	–
F	–	1	1	1	1	4	4	–
G	0	0	0	0	0	3	0	–
H	1	1	1	3	3	0	1	–
I	5	5	5	5	5	2	5	–

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	12	10	2	3	8	6	0	–
2	10	9	2	2	4	6	1	–
3	8	8	4	4	1	2	0	–
4	13	9	1	2	3	0	0	–
5	10	9	4	3	1	0	1	–
6	7	10	5	4	2	0	0	–
7	10	9	1	2	1	0	0	–
8	12	5	2	3	0	0	0	–
9	7	4	1	1	3	0	0	–
10	13	1	3	5	1	0	0	–
Total:	102	74	25	29	24	14	2	–

Number of Shocks: 8

Feeding Latency: 6 sec.

Feeding Time: 125 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of S

Feeding Lat

Feeding Tin

Condition: HH   Group: NCP   Litter: 2

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	2	1	1	1	1	1	-
B	3	3	3	3	3	2	2	-
C	2	2	4	2	2	4	2	-
D	1	3	3	3	2	3	3	-
E	0	0	1	1	1	1	1	-
F	-	1	1	1	1	4	4	-
G	0	0	3	0	0	3	3	-
H	1	1	3	3	3	0	1	-
I	5	5	1	1	1	1	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	6	7	6	16	10	0	0	-
2	9	3	1	10	13	0	0	-
3	7	2	5	9	11	0	5	-
4	8	0	11	9	9	0	4	-
5	6	0	7	9	10	0	7	-
6	4	1	7	9	11	0	15	-
7	8	0	1	10	0	0	12	-
8	6	0	0	14	4	0	15	-
9	8	0	0	15	4	0	12	-
10	9	0	0	2	3	0	4	-
Total:	71	13	38	103	75	0	64	-

Number of Shocks: 8

Feeding Latency: 5 sec.

Feeding Time: 110 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: CNF Litter: 2

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	3	2	3	2	2	3	2	-
C	2	2	2	2	2	2	2	-
D	2	3	3	3	2	2	1	-
E	1	1	1	1	1	1	1	-
F	-	1	1	3	1	1	1	-
G	3	0	0	0	0	0	0	-
H	1	1	1	0	1	1	1	-
I	5	5	5	5	5	5	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	6	1	11	3	6	4	0	-
2	5	0	9	4	5	0	0	-
3	3	0	11	3	5	3	1	-
4	2	0	9	3	0	5	2	-
5	1	0	5	5	0	4	0	-
6	0	0	4	0	7	8	0	-
7	4	0	4	4	2	0	2	-
8	4	0	6	1	0	0	4	-
9	2	0	3	1	0	2	0	-
10	4	0	2	0	14	0	0	-
Total:	31	1	64	24	39	26	9	-

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 145 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH   Group: CON   Litter: 3

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	2	2	2	2	2	2	-
C	2	2	2	2	2	2	2	-
D	1	1	1	2	2	2	2	-
E	1	1	1	1	1	1	1	-
F	-	1	1	3	1	1	2	-
G	0	0	0	0	0	0	0	-
H	1	1	1	0	0	1	1	-
I	5	5	5	5	5	5	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	1	4	3	3	0	0	-
2	0	0	3	0	3	0	1	-
3	1	0	0	2	1	0	3	-
4	0	1	0	1	1	0	0	-
5	0	1	2	5	0	0	2	-
6	0	0	3	1	0	0	2	-
7	0	0	13	1	0	0	3	-
8	0	0	14	1	2	0	3	-
9	0	1	0	0	0	0	0	-
10	0	0	3	0	0	0	0	-
Total:	1	4	42	14	10	0	14	-

Number of Shocks: 4

Feeding Latency: 5 sec.

Feeding Time: 80 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: NC Litter: 3

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	3	1	1	1	1	1	1	-
B	2	2	2	1	2	2	2	-
C	2	2	2	2	2	2	2	-
D	1	1	1	1	1	1	1	-
E	1	1	1	1	1	3	1	-
F	-	1	3	3	2	4	4	-
G	0	0	0	0	0	0	0	-
H	0	1	0	0	0	0	0	-
I	2	5	5	5	5	2	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	2	2	6	3	3	2	0	-
2	2	5	12	2	5	3	1	-
3	8	2	16	6	4	0	0	-
4	8	6	15	4	2	0	4	-
5	3	1	2	4	4	0	6	-
6	3	2	4	0	5	0	3	-
7	8	4	6	4	2	0	4	-
8	3	1	5	0	3	0	5	-
9	7	2	0	3	3	0	7	-
10	2	4	2	3	4	0	2	-
Total:	46	29	68	29	35	5	32	-

Number of Shocks: 4

Feeding Latency: 5 sec.

Feeding Time: 125 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: NCP Litter: 3

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	1	1	1	1	1	1	-
B	3	3	2	2	2	3	2	-
C	4	4	2	2	2	4	3	-
D	1	3	2	3	3	3	3	-
E	1	2	1	1	1	1	1	-
F	-	1	1	1	1	4	4	-
G	0	0	0	0	0	1	1,2	-
H	1	1	0	3	0	0	0	-
I	3	5	5	5	5	2	1	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	0	1	1	0	0	-
2	0	0	0	3	0	2	2	-
3	0	0	1	2	2	4	8	-
4	0	0	2	0	1	0	4	-
5	0	0	6	0	0	0	11	-
6	0	0	1	2	0	0	4	-
7	0	0	5	0	0	0	2	-
8	0	0	3	1	1	0	0	-
9	0	0	1	0	1	0	0	-
10	0	0	0	0	0	0	0	-
Total:	0	0	19	9	6	6	31	-

Number of Shocks: 4

Feeding Latency: 5 sec.

Feeding Time: 130 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of S

Feeding Lat

Feeding Tim

Condition: HH Group: CNF Litter: 3

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	2	1	1	1	1	1	–
B	3	3	3	2	2	2	2	–
C	4	3	2	2	2	2	3	–
D	1	1	1	1	1	2	2	–
E	1	1	1	3	1	1	1	–
F	–	1	1	1	3	1	2	–
G	0	0	0	0	0	1	1	–
H	1	1	1	3	1	1	1	–
I	3	1	1	1	1	1	1	–

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	2	2	1	0	0	–
2	0	0	1	0	0	0	1	–
3	0	0	0	0	0	0	1	–
4	0	0	0	2	0	0	0	–
5	0	0	1	0	0	0	0	–
6	0	0	0	1	0	1	0	–
7	0	0	0	0	0	0	0	–
8	0	0	0	0	0	0	0	–
9	0	1	1	0	0	0	0	–
10	0	0	1	0	0	1	0	–
Total:	0	1	6	5	1	2	2	–

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 130 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH   Group: CON   Litter: 4

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	4	1	1	1	1	1	–
B	2	2	2	2	1	2	2	–
C	2	2	2	2	2	2	1	–
D	2	2	2	3	2	3	2	–
E	1	1	1	2	1	1	1	–
F	–	1	1	1	3	4	4	–
G	0	0	0	0	0	1	3	–
H	0	1	5	5	0	1	5	–
I	5	5	1	1	1	1	1	–

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	12	11	20	11	18	3	3	–
2	6	5	17	2	24	0	9	–
3	10	9	30	17	7	0	6	–
4	7	6	32	23	0	0	8	–
5	11	5	34	13	0	0	9	–
6	10	8	32	5	0	3	11	–
7	10	9	31	3	1	0	15	–
8	11	2	14	12	6	0	11	–
9	8	3	34	5	2	0	2	–
10	8	5	24	12	4	0	12	–
Total:	93	63	268	103	62	6	86	–

Number of Shocks: 8

Feeding Latency: 10 sec.

Feeding Time: 120 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding L

Feeding T

Condition: HH Group: NC Litter: 4

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	2	1	1	1	-
B	2	3	3	3	2	2	2	-
C	2	4	2	4	4	4	2	-
D	1	1	1	1	1	2	3	-
E	1	1	1	2	1	1	1	-
F	-	1	1	1	1	4	2	-
G	0	0	0	0	0	0	0	-
H	1	1	1	1	1	1	1	-
I	5	5	5	5	5	1	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	0	0	0	9	0	-
2	0	0	0	0	0	1	0	-
3	2	5	0	0	0	0	0	-
4	1	1	0	0	1	0	0	-
5	1	2	0	0	1	0	0	-
6	1	0	0	0	0	0	0	-
7	2	1	0	0	1	1	0	-
8	2	0	0	0	0	0	0	-
9	0	1	0	0	0	0	0	-
10	0	1	0	0	0	0	0	-
Total:	9	11	0	0	3	11	0	-

Number of Shocks: 8

Feeding Latency: 5 sec.

Feeding Time: 146 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: NCP Litter: 4

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	1	1	1	1	1	1	–
B	3	3	3	3	2	2	3	–
C	4	2	2	4	2	4	3	–
D	1	2	1	3	3	3	3	–
E	0	1	1	2	1	1	1	–
F	–	4	4	4	4	4	4	–
G	0	0	0	0	0	0	0	–
H	0	1	1	0	0	0	0	–
I	3	5	5	5	5	1	1	–

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	2	0	0	1	0	–
2	1	3	1	0	0	0	0	–
3	2	2	2	0	0	0	0	–
4	2	2	3	0	0	0	0	–
5	1	1	1	0	0	0	0	–
6	2	1	0	0	4	0	0	–
7	0	1	0	0	0	0	0	–
8	1	2	3	2	0	0	0	–
9	0	2	1	0	0	0	0	–
10	4	1	0	0	0	0	0	–
Total:	13	15	13	2	4	1	0	–

Number of Shocks: 8

Feeding Latency: 5 sec.

Feeding Time: 115 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: CNF Litter: 4

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	3	1	1	1	1	1	1	-
B	1	2	2	2	2	3	3	-
C	2	4	4	2	2	4	4	-
D	1	3	2	1	2	3	3	-
E	0	1	1	1	1	1	1	-
F	-	1	1	1	1	1	1	-
G	0	0	3	0	0	0	0	-
H	1	1	1	1	1	1	1	-
I	5	3	3	5	5	5	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	7	16	6	12	13	13	15	-
2	12	7	0	10	17	20	17	-
3	11	23	0	7	11	18	12	-
4	9	9	0	16	16	7	9	-
5	4	4	14	21	8	12	13	-
6	7	20	26	23	13	13	16	-
7	1	17	0	20	11	13	21	-
8	0	14	7	23	17	15	15	-
9	8	11	3	26	6	11	11	-
10	11	16	3	17	3	9	13	-
Total:	70	147	59	175	115	131	142	-

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 190 sec.

Condition:

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding L

Feeding T

Condition: HH Group: CON Litter: 5

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	–
B	2	2	2	2	2	2	2	–
C	2	2	2	2	2	2	3	–
D	3	2	3	2	3	3	3	–
E	1	1	1	1	1	2	1	–
F	–	4	2	1	2	4	4	–
G	0	0	0	0	0	0	0	–
H	1	1,3	1	1	1	0	0	–
I	5	5	5	5	5	1	1	–

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	0	0	0	0	0	–
2	2	5	0	0	0	0	0	–
3	0	0	0	0	0	0	0	–
4	0	0	0	0	0	0	0	–
5	0	3	0	0	0	0	0	–
6	1	6	0	0	0	0	0	–
7	0	0	0	0	0	0	0	–
8	0	0	0	0	0	0	0	–
9	0	0	0	0	0	0	0	–
10	3	0	0	0	0	0	0	–
Total:	6	14	0	0	0	0	0	–

Number of Shocks: 3

Feeding Latency: 5 sec.

Feeding Time: 485 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: NC Litter: 5

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	2	2	1	1	1	-
B	2	2	2	2	2	2	2	-
C	2	2	2	2	2	2	3	-
D	1	1	2	2	3	2	3	-
E	1	1	1	1	1	2	1	-
F	-	1	1	1	1	4	4	-
G	0	0	0	0	0	0	0	-
H	1	1,3	1,3	1,3	1,3	0	0	-
I	5	5	5	5	5	1	1	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	8	10	6	0	3	2	0	-
2	3	6	2	0	6	1	0	-
3	13	8	6	1	1	0	0	-
4	6	1	4	0	0	0	0	-
5	8	2	5	0	5	0	0	-
6	4	10	2	0	0	0	0	-
7	11	5	1	3	3	0	0	-
8	1	4	0	0	6	0	0	-
9	7	3	3	0	0	0	0	-
10	5	6	2	0	1	0	0	-
Total:	66	55	31	4	25	3	0	-

Number of Shocks: 3

Feeding Latency: 35 sec.

Feeding Time: 530 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: NCP Litter: 5

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	2	2	2	2	2	2	-
C	3	2	2	2	2	2	3	-
D	3	1	2	2	3	2	3	-
E	1	1	1	1	1	1	1	-
F	-	2	1	1	1	4	2	-
G	0	0	0	0	0	0	0	-
H	1	1,3	1,3	1,3	1	0	1	-
I	5	5	3	5	5	1	5	-

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	0	21	1	19	3	1	0	-
2	0	16	4	7	7	0	0	-
3	3	24	2	13	2	0	0	-
4	0	10	2	10	0	0	0	-
5	5	6	1	5	0	0	0	-
6	14	3	5	0	0	0	0	-
7	0	3	1	1	0	0	0	-
8	0	0	0	1	0	0	0	-
9	0	0	1	3	0	0	0	-
10	0	0	7	3	0	0	0	-
Total:	22	83	24	62	12	1	0	-

Number of Shocks: 3

Feeding Latency: 23 sec.

Feeding Time: 425 sec.

Condition:

Measure:

A

B

C

D

E

F

G

H

I

Minute:

1

2

3

4

5

6

7

8

9

10

Total:

Number of S

Feeding Lat

Feeding Tir

Condition: HH   Group: CNF   Litter: 5

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	1	2	2	2	2	3	-
C	1	2	2	2	2	2	2	-
D	1	1	2	2	1	2	2	-
E	1	1	1	1	1	1	1	-
F	-	4	2	1	1	1	1	-
G	0	0	0	0	0	0	0	-
H	0	0	1	1	1	1	1	-
I	1	2	1	5	5	5	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	5	13	11	16	11	-
2	0	0	11	9	13	10	19	-
3	0	6	16	6	6	17	14	-
4	0	4	15	17	8	16	16	-
5	0	0	3	14	3	15	16	-
6	0	13	1	14	12	12	14	-
7	0	16	1	10	15	14	13	-
8	0	9	0	7	7	9	9	-
9	1	11	3	11	6	11	13	-
10	0	6	9	6	2	13	6	-
Total:	1	65	64	107	83	133	131	-

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 330 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: CON Litter: 6

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	2	2	1	1	1	1	-
B	2	2	2	2	2	2	2	-
C	2	2	2	2	4	2	2	-
D	3	3	2	2	3	3	2	-
E	1	1	1	1	1	1	1	-
F	-	1	1	1	3	4	4	-
G	0	0	0	0	0	0	0	-
H	1	0	1	1,3	1	1	1	-
I	3	5	5	3	5	1	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	11	8	0	0	0	-
2	0	0	7	5	0	0	0	-
3	0	0	0	3	0	0	0	-
4	0	5	0	3	0	0	0	-
5	0	0	4	0	0	0	0	-
6	4	6	3	0	0	0	0	-
7	0	0	0	0	0	0	0	-
8	0	2	0	1	0	0	3	-
9	0	1	0	5	0	0	1	-
10	0	0	0	0	0	0	0	-
Total:	4	14	25	25	0	0	4	-

Number of Shocks: 17

Feeding Latency: 5 sec.

Feeding Time: 485 sec.

Conditio

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total:

Number of

Feeding La

Feeding Ti

Condition: HH Group: NC Litter: 6

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	2	2	2	2	2	2	-
C	2	2	2	2	2	2	2	-
D	2	2	1	1	2	2	1	-
E	1	1	1	1	1	3	1	-
F	-	1	1	1	1	3	2	-
G	0	0	0	0	0	0	0	-
H	1	1	1,3	1,3	1	0	1	-
I	5	5	5	5	5	5	5	-

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	0	7	20	7	12	7	7	-
2	0	3	3	10	10	10	19	-
3	1	6	16	8	10	12	18	-
4	2	7	15	8	9	8	20	-
5	0	6	8	7	10	14	19	-
6	0	4	20	7	10	16	17	-
7	1	3	13	7	14	17	14	-
8	1	2	9	14	11	20	11	-
9	0	1	2	10	9	13	19	-
10	0	5	6	10	9	22	12	-
Total:	5	44	112	88	104	139	156	-

Number of Shocks: 17

Feeding Latency: 5 sec.

Feeding Time: 505 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total

Number o

Feeding I

Feeding T

Condition: HH Group: NCP Litter: 6

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	2	2	1	1	1	1	-
B	2	2	2	2	2	2	2	-
C	4	2	2	2	2	2	3	-
D	3	3	2	1	3	1	3	-
E	1	2	1	1	1	1	1	-
F	-	1	1	1	1	4	4	-
G	0	0	0	0	0	0	0	-
H	1	1	1	1	1	1	1	-
I	5	5	5	5	5	5	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	1	0	7	2	0	0	-
2	0	3	2	1	0	0	0	-
3	0	2	0	2	0	0	0	-
4	0	2	3	0	0	1	0	-
5	0	3	3	0	2	0	0	-
6	0	0	4	2	0	0	0	-
7	3	0	3	0	0	0	0	-
8	10	1	1	1	3	0	0	-
9	1	0	0	0	0	0	0	-
10	0	0	0	0	0	0	0	-
Total:	14	12	16	13	7	1	0	-

Number of Shocks: 17

Feeding Latency: 5 sec.

Feeding Time: 390 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total

Number o

Feeding

Feeding

Condition: HH Group: CNF Litter: 6

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	3	5	2	5	5	3	-
C	2	2	2	4	4	4	4	-
D	2	2	2	3	3	3	3	-
E	0	1	1	1	1	1	1	-
F	-	4	2	1	1	1	1	-
G	0	0	0	0	0	0	0	-
H	0	1	1	1	1	1	1	-
I	2	4	5	5	5	5	5	-

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	0	3	4	6	10	13	7	-
2	0	5	0	7	7	9	12	-
3	3	9	1	7	16	16	10	-
4	1	3	6	3	14	12	16	-
5	0	3	4	6	17	11	14	-
6	0	2	3	11	10	11	11	-
7	0	0	3	14	12	17	8	-
8	1	1	7	12	11	13	12	-
9	3	1	3	11	10	10	12	-
10	6	0	4	16	10	9	16	-
Total:	14	27	35	93	117	121	108	-

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 410 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total

Number o

Feeding I

Feeding T

Condition: HH Group: CON Litter: 7

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	2	2	2	2	2	2	-
C	2	2	2	2	2	2	2	-
D	3	3	2	2	2	2	2	-
E	1	1	1	1	1	1	1	-
F	-	1	1	1	1	4	4	-
G	0	0	0	0	0	0	0	-
H	1	1	1	1,3	1	0	1	-
I	5	5	5	5	5	5	5	-

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	2	3	4	1	1	0	-
2	0	0	4	3	2	1	0	-
3	0	2	4	6	1	0	1	-
4	0	0	6	2	1	2	9	-
5	0	0	4	14	8	7	0	-
6	3	0	1	12	4	0	2	-
7	0	0	0	3	1	0	0	-
8	2	0	0	1	2	3	1	-
9	0	1	0	2	0	1	2	-
10	0	0	9	1	1	0	2	-
Total:	5	5	31	48	21	15	17	-

Number of Shocks: 5

Feeding Latency: 5 sec.

Feeding Time: 320 sec.

Conditio

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total

Number o

Feeding

Feeding

Condition: HH   Group: NC   Litter: 7

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	–
B	1	1	1	1	2	2	2	–
C	3	3	3	3	2	2	2	–
D	3	3	3	3	3	2	2	–
E	1	1	1	1	1	1	1	–
F	–	1	2	3	3	1	4	–
G	0	3	0	0	0	0	0	–
H	0	0	0	1	1,3	1	0	–
I	1	2	1	5	5	5	1	–

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	0	0	0	0	0	–
2	0	0	0	0	0	0	0	–
3	0	0	0	0	0	0	0	–
4	0	0	0	0	0	0	0	–
5	0	0	0	0	2	0	0	–
6	0	0	0	0	4	0	0	–
7	0	0	0	0	6	0	0	–
8	0	0	0	0	6	0	0	–
9	0	0	0	0	6	0	0	–
10	0	0	0	0	5	0	0	–
Total:	0	0	0	0	27	0	0	–

Number of Shocks: 5

Feeding Latency: 10 sec.

Feeding Time: 420 sec.

Conditi

Measure

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total

Number of

Feeding L

Feeding T

Condition: HH   Group: NCP   Litter: 7

Behavior Checklist Data

Day

Measure:	1	2	3	4	5	S1	S2	S3
A	2	2	1	2	1	1	1	–
B	2	0	2	2	2	2	2	–
C	2	3	2	2	2	2	2	–
D	3	2	3	3	2	2	3	–
E	1	1	1	1	1	3	3	–
F	–	1	1	1	1	4	4	–
G	0	0	0	0	0	1	0	–
H	5	5	5	5	5	5	5	–
I								

Vocalization Data

Day

Minute:	1	2	3	4	5	S1	S2	S3
1	0	0	0	0	0	0	0	–
2	0	0	0	4	4	0	0	–
3	0	0	1	3	7	0	4	–
4	0	0	1	8	3	0	2	–
5	0	4	3	7	7	0	6	–
6	0	1	0	1	3	0	0	–
7	0	1	0	1	0	0	0	–
8	0	0	0	1	4	0	0	–
9	0	0	2	0	0	3	1	–
10	0	0	0	0	5	0	0	–
Total:	0	6	7	25	33	3	13	–

Number of Shocks: 5

Feeding Latency: 5 sec.

Feeding Time: 315 sec.

Condition

Measure:

A
B
C
D
E
F
G
H
I

Minute:

1
2
3
4
5
6
7
8
9
10

Total

Number o

Feeding

Feeding

Condition: HH Group: CNF Litter: 7

Behavior Checklist Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
A	1	1	1	1	1	1	1	-
B	2	3	3	3	2	2	3	-
C	4	2	2	4	4	4	4	-
D	3	2	2	3	3	3	3	-
E	1	1	1	1	1	1	1	-
F	-	1	1	1	1	1	1	-
G	0	0	0	0	0	0	0	-
H	1	0	1	1	1	1	1	-
I	5	5	5	5	5	5	5	-

Vocalization Data

Minute:	Day 1	2	3	4	5	S1	S2	S3
1	0	0	0	3	0	5	0	-
2	0	0	1	2	0	3	6	-
3	0	0	3	0	3	2	2	-
4	0	0	0	4	2	0	1	-
5	0	0	1	1	0	2	1	-
6	0	2	1	0	6	6	1	-
7	0	1	1	0	0	11	0	-
8	0	0	2	3	4	4	9	-
9	0	0	1	6	1	6	12	-
10	0	0	0	13	1	3	7	-
Total:	0	3	10	32	17	42	40	-

Number of Shocks: 0

Feeding Latency: 5 sec.

Feeding Time: 345 sec.

APPENDIX C

Summary of Shock-chamber Activity Data
for Individual Ss

LL-CON-1

Shock Chamber Activity Data

Day

LL-CON-1

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	125(11)	163(13)	351(6)	505(3)	540(1)	341(6)	377(9)	249(3)
Escape	22(1)	6(1)	-	-	-	-	-	15(2)
Gen. Activity	383(14)	343(12)	187(5)	35(2)	-	-	23(2)	18(1)
Pacing	-	-	-	-	-	-	-	-
Rubbing	4(1)	-	-	-	-	-	-	-
Trembling	-	-	-	-	-	53(2)	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	6(2)	18(4)	2(1)	-	-	184(6)	140(6)	258(4)
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(29)	(30)	(12)	(5)	(1)	(14)	(17)	(10)

LL-NC-1

Shock Chamber Activity Data

Day

LL-NC-1

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	218(13)	122(14)	171(11)	175(15)	238(12)	283(7)	382(8)	532(2)
Escape	170(9)	118(8)	85(10)	131(8)	82(7)	49(3)	111(4)	-
Gen. Activity	121(12)	71(7)	193(25)	195(15)	176(17)	200(11)	47(6)	8(1)
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	63(13)	19(2)	39(7)	8(1)	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	31(3)	7(1)	21(4)	20(3)	5(1)	-	-	-
Kneading	-	12(1)	7(1)	-	-	-	-	-
Playing	-	210(13)	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(37)	(44)	(64)	(43)	(44)	(22)	(18)	(3)

LL-NCP-1

Shock Chamber Activity Data

Day

LL-NCP-1

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	58(9)	62(7)	198(6)	61(5)	-	533(3)	494(2)	540(1)
Escape	356(16)	7(1)	124(7)	118(7)	31(2)	-	46(2)	-
Gen. Activity	105(13)	296(18)	212(13)	261(15)	341(20)	7(1)	-	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	68(9)	-	-	-
Trembling	-	-	-	-	-	391(1)	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	21(4)	80(3)	3(1)	100(8)	38(6)	-	-	-
Kneading	-	-	-	-	65(7)	-	-	-
Playing	-	95(7)	3(1)	-	15(1)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(42)	(36)	(28)	(35)	(45)	(5)	(4)	(1)

LL-CNF-1

Shock Chamber Activity Data

Day

LL-CNF-1

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	8(2)	12(1)	6(1)	-	-	95(9)	44(6)	97(7)
Escape	122(13)	40(4)	2(1)	-	-	60(6)	89(8)	67(5)
Gen. Activity	124(17)	116(19)	145(23)	91(17)	124(21)	252(12)	224(12)	285(9)
Pacing	-	-	-	-	4(1)	-	-	-
Rubbing	188(20)	234(21)	302(30)	337(26)	268(25)	18(3)	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	2(1)	10(1)	-	-	19(1)	89(7)	75(5)	3(1)
Kneading	187(12)	240(15)	202(20)	305(26)	143(15)	-	-	-
Playing	-	3(1)	-	-	39(4)	36(5)	108(9)	88(1)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(65)	(62)	(75)	(69)	(67)	(42)	(40)	(23)

LL-CON-2

Shock Chamber Activity Data

Day

LL-CON-2

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	104(9)	21(4)	11(3)	18(3)	21(2)	241(5)	95(8)	129(10)
Escape	15(1)	-	-	44(4)	23(2)	-	11(1)	52(4)
Gen. Activity	310(15)	172(17)	78(9)	66(12)	153(18)	28(5)	299(14)	209(8)
Pacing	71(7)	150(11)	248(15)	129(12)	248(18)	-	-	-
Rubbing	96(10)	196(14)	311(13)	250(16)	225(19)	-	3(1)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	6(1)	151(2)	137(2)	147(8)	127(5)	247(1)	117(6)	150(7)
Kneading	-	4(1)	16(2)	-	10(2)	-	-	-
Playing	19(2)	-	5(1)	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	24(3)	15(5)	-
Total:	(45)	(48)	(45)	(61)	(60)	(14)	(35)	(29)

LL-NC-2

Shock Chamber Activity Data

Day

LL-NC-2

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	523(2)	443(7)	444(8)	486(4)	380(12)	536(2)	400(3)	520(3)
Escape	-	-	15(1)	-	-	-	-	-
Gen. Activity	17(1)	62(5)	69(5)	3(1)	91(6)	4(1)	-	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	-
Trembling	173(1)	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	16(2)	16(3)	6(1)	69(7)	-	140(3)	20(2)
Kneading	-	19(2)	6(1)	45(2)	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(4)	(16)	(18)	(8)	(25)	(3)	(6)	(5)

LL-NCP-2

Shock Chamber Activity Data

Day

LL-NCP-2

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	4(1)	16(3)	-	3(1)	-	540(1)	491(4)	530(2)
Escape	57(5)	16(2)	7(1)	97(11)	59(7)	-	-	-
Gen. Activity	233(18)	136(21)	108(17)	143(14)	87(15)	-	49(3)	-
Pacing	193(16)	199(16)	297(19)	226(20)	281(19)	-	-	-
Rubbing	214(17)	294(21)	381(20)	249(23)	374(21)	-	-	-
Trembling	2(1)	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	4(1)	-	13(1)	-	19(3)	-	-	10(1)
Kneading	6(1)	-	-	-	-	-	-	-
Playing	22(3)	78(6)	6(1)	25(4)	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(63)	(69)	(59)	(73)	(65)	(1)	(7)	(3)

LL-CNF-2

Shock Chamber Activity Data

Day

LL-CNF-2

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	426(6)	261(8)	126(10)	279(9)	401(2)	402(2)	133(4)	157(5)
Escape	72(3)	-	20(1)	-	-	-	10(1)	10(1)
Gen. Activity	20(2)	3(1)	60(4)	73(4)	55(1)	105(1)	262(4)	334(8)
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	10(1)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	22(2)	276(6)	334(8)	165(7)	84(3)	33(2)	135(2)	29(3)
Kneading	-	-	-	23(2)	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(13)	(15)	(23)	(22)	(6)	(5)	(11)	(18)

LL-CON-3

<u>Shock Chamber Activity Data</u>

Day

LL-CON-3

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	82(6)	108(11)	61(9)	11(2)	31(9)	197(8)	56(7)	93(12)
Escape	-	33(2)	11(2)	49(9)	15(1)	10(1)	-	7(2)
Gen. Activity	330(9)	259(13)	343(27)	283(23)	337(29)	153(11)	156(22)	226(23)
Pacing	-	-	-	101(13)	92(12)	-	100(14)	62(4)
Rubbing	-	4(1)	105(16)	129(17)	152(22)	8(2)	247(26)	154(22)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	89(4)	20(3)	20(2)	3(1)	143(2)	7(1)	-
Kneading	-	-	-	-	2(1)	-	-	-
Playing	118(7)	47(3)	-	13(2)	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	29(6)	24(9)	9(5)
Total:	(22)	(34)	(57)	(68)	(75)	(30)	(79)	(68)

LL-NC-3

<u>Shock Chamber Activity Data</u>

Day

LL-NC-3

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	-	16(2)	63(5)	-	-	458(7)	308(4)	109(6)
Escape	39(5)	57(5)	87(8)	29(5)	20(3)	-	-	28(4)
Gen. Activity	136(13)	90(16)	79(7)	5(1)	62(9)	82(6)	214(4)	242(12)
Pacing	195(16)	262(25)	147(17)	220(30)	273(23)	-	-	98(8)
Rubbing	275(25)	260(30)	279(33)	275(46)	286(24)	-	18(1)	118(7)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	12(1)	19(3)	26(2)	11(1)	-	-	-	-
Kneading	136(15)	87(14)	59(17)	213(34)	182(23)	-	-	45(6)
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(75)	(95)	(89)	(117)	(82)	(13)	(9)	(43)

LL-NCP-3

Shock Chamber Activity Data

Day

LL-NCP-3

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	99(15)	60(5)	76(11)	9(3)	22(4)	489(4)	320(4)	445(7)
Escape	92(10)	54(6)	50(7)	56(8)	48(7)	12(1)	-	7(1)
Gen. Activity	324(23)	118(19)	66(7)	41(6)	68(11)	34(4)	174(7)	49(5)
Pacing	-	248(18)	153(14)	141(18)	236(24)	-	-	-
Rubbing	21(5)	266(17)	228(23)	241(21)	280(22)	-	-	-
Trembling	-	-	-	-	-	5(1)	-	3(1)
Horripilation	-	-	-	-	-	2(1)	-	2(1)
Grooming	4(1)	25(3)	-	152(11)	90(6)	-	4(1)	33(3)
Kneading	-	-	115(11)	-	32(4)	-	-	-
Playing	-	7(1)	-	-	-	-	42(3)	6(1)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(54)	(69)	(73)	(67)	(78)	(11)	(15)	(19)

LL-CNF-3

Shock Chamber Activity Data

Day

LL-CNF-3

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	215 (12)	361 (15)	253 (16)	246 (23)	282 (20)	27 (2)	94 (5)	132 (12)
Escape	-	-	47 (4)	-	15 (3)	5 (1)	-	39 (3)
Gen. Activity	123 (7)	41 (5)	149 (13)	147 (15)	198 (18)	400 (12)	43 (7)	310 (12)
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	172 (13)	138 (10)	91 (4)	147 (10)	45 (4)	30 (3)	396 (3)	59 (4)
Kneading	-	-	-	-	-	-	7 (2)	-
Playing	30 (4)	-	-	-	-	78 (6)	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(36)	(30)	(37)	(48)	(45)	(24)	(17)	(31)

LL-CON-4

Shock Chamber Activity Data

Day

LL-CON-4

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	99(14)	123(10)	83(3)	100(12)	107(12)	78(8)	55(11)	155(12)
Escape	43(4)	99(6)	75(10)	101(11)	75(9)	105(10)	129(10)	82(6)
Gen. Activity	325(21)	224(16)	298(21)	182(19)	321(24)	200(18)	261(26)	234(25)
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	8(4)	10(3)
Trembling	-	-	-	-	-	17(2)	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	31(5)	42(4)	-	-	-	-	19(3)	-
Kneading	-	-	20(3)	88(8)	16(2)	99(9)	4(1)	9(1)
Playing	42(4)	52(3)	64(7)	69(5)	21(3)	41(6)	-	4(1)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	64(12)	46(6)
Total:	(48)	(39)	(44)	(55)	(50)	(55)	(67)	(54)

LL-NC-4

Shock Chamber Activity Data

Day

LL-NC-4

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	16(1)	12(2)	-	20(1)	30(6)	165(5)	81(7)	120(6)
Escape	28(5)	58(8)	112(12)	95(11)	144(18)	287(2)	136(8)	106(4)
Gen. Activity	383(21)	315(28)	172(19)	125(19)	237(28)	88(7)	242(20)	312(11)
Pacing	-	-	105(8)	3(1)	-	-	-	-
Rubbing	58(9)	86(17)	57(7)	3(1)	5(2)	-	32(3)	2(1)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	32(2)	77(4)	49(4)	-	-	-
Kneading	5(1)	-	-	85(9)	30(3)	-	31(4)	-
Playing	50(6)	69(4)	102(6)	132(10)	45(4)	-	18(3)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(43)	(59)	(54)	(56)	(65)	(14)	(45)	(22)

LL-NCP-4

Shock Chamber Activity Data

Day

LL-NCP-4

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	341(8)	152(7)	89(9)	89(5)	29(3)	503(3)	540(1)	540(1)
Escape	-	3(1)	46(4)	41(6)	20(1)	37(2)	-	-
Gen. Activity	163(7)	94(3)	76(11)	125(18)	184(20)	-	-	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	27(4)	-	66(10)	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	4(2)	-	-
Grooming	7(1)	-	6(1)	5(1)	-	-	-	-
Kneading	29(2)	-	-	10(2)	-	-	-	-
Playing	-	291(6)	296(8)	270(12)	241(12)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(18)	(17)	(37)	(44)	(46)	(7)	(1)	(1)

LL-CNF-4

Shock Chamber Activity Data

Day

LL-CNF-4

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	81(7)	231(2)	352(4)	142(4)	158(1)	15(2)	105(6)	8(1)
Escape	35(1)	-	-	-	-	-	-	-
Gen. Activity	113(9)	-	60(4)	26(1)	18(1)	73(7)	12(1)	55(4)
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	4(1)	-	8(1)	40(2)	-	2(1)	-	43(2)
Kneading	-	-	-	-	-	-	-	-
Playing	307(12)	309(2)	120(6)	232(4)	364(2)	450(6)	423(6)	434(7)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(30)	(4)	(15)	(11)	(4)	(16)	(13)	(14)

LL-CON-5

Shock Chamber Activity Data

Day

LL-CON-5

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	10(2)	55(4)	22(2)	6(1)	-	100(8)	101(7)	33(5)
Escape	4(1)	74(7)	63(6)	43(6)	-	7(2)	-	4(1)
Gen. Activity	334(26)	259(21)	303(22)	321(28)	304(19)	300(30)	295(24)	353(31)
Pacing	-	-	-	-	-	-	-	-
Rubbing	100(14)	110(13)	83(9)	137(20)	87(13)	25(7)	28(5)	27(8)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	63(7)	45(4)	-	11(2)	21(5)	4(1)	44(2)	40(8)
Kneading	21(3)	-	14(3)	28(5)	29(4)	-	14(1)	34(4)
Playing	8(1)	12(2)	57(6)	-	99(1)	54(3)	29(6)	27(2)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	50(16)	29(14)	22(11)
Total:	(54)	(51)	(48)	(62)	(42)	(67)	(59)	(70)

LL-NC-5

Shock Chamber Activity Data

Day

LL-NC-5

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	34(3)	64(4)	79(3)	21(4)	24(5)	285(10)	245(10)	182(12)
Escape	121(9)	50(6)	105(7)	78(6)	50(3)	32(4)	83(5)	18(2)
Gen. Activity	262(14)	142(15)	154(13)	175(12)	193(11)	112(12)	124(15)	147(21)
Pacing	70(4)	78(3)	32(2)	79(3)	57(5)	-	-	-
Rubbing	144(9)	137(8)	66(3)	49(4)	140(3)	69(9)	69(8)	78(10)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	39(1)	20(1)	69(1)	63(1)	26(1)	8(1)	19(6)	63(8)
Kneading	13(1)	10(1)	-	-	-	57(7)	-	5(1)
Playing	14(1)	95(3)	68(3)	106(4)	104(4)	-	-	47(5)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(42)	(41)	(32)	(34)	(32)	(43)	(44)	(59)

LL-NCP-5

Shock Chamber Activity Data

Day

LL-NCP-5

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	-	-	5(2)	-	24(7)	410(4)	520(4)	472(6)
Escape	70(7)	58(9)	13(1)	3(1)	-	62(3)	12(1)	-
Gen. Activity	140(20)	146(23)	110(14)	69(17)	102(11)	68(3)	3(1)	33(4)
Pacing	-	-	-	-	-	-	-	-
Rubbing	186(18)	200(31)	153(21)	311(25)	72(7)	-	-	-
Trembling	-	-	-	-	-	5(1)	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	35(5)	9(3)	103(4)	56(4)	183(3)	-	5(1)	35(2)
Kneading	206(12)	272(23)	273(15)	341(22)	218(13)	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(62)	(89)	(57)	(69)	(41)	(11)	(7)	(12)

LL-CNF-5

Shock Chamber Activity Data

Day

LL-CNF-5

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	33(4)	89(12)	227(13)	189(12)	199(14)	44(2)	138(4)	68(5)
Escape	20(2)	12(2)	28(4)	118(7)	3(1)	12(1)	-	82(4)
Gen. Activity	199(16)	167(19)	151(17)	176(14)	126(8)	274(10)	244(7)	272(8)
Pacing	215(18)	54(8)	54(5)	26(4)	-	34(2)	9(1)	-
Rubbing	221(16)	113(12)	111(13)	54(9)	21(4)	201(8)	158(6)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	6(2)	-	9(1)	2(1)	11(2)	-	-	-
Kneading	41(7)	7(1)	9(1)	-	13(1)	-	-	-
Playing	17(1)	151(5)	-	-	167(6)	-	-	118(3)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(66)	(59)	(54)	(47)	(36)	(23)	(18)	(20)

LL-CON-6

Shock Chamber Activity Data

Day

LL-CON-6

<u>Shock Chamber Activity Data</u>

	Day							
<u>Measure</u>:	1	2	3	4	5	S1	S2	S3
Inactivity	88(11)	47(9)	124(10)	206(13)	47(7)	264(13)	148(11)	-
Escape	452(12)	392(13)	155(9)	119(12)	23(4)	37(4)	57(4)	-
Gen. Activity	-	101(12)	258(17)	182(19)	280(11)	216(20)	264(18)	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	3(1)	10(2)	3(1)	-	11(3)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	-	23(2)	-	-	4(1)	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	-	-	187(5)	-	56(5)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	23(4)	-	-
Total:	(23)	(34)	(37)	(48)	(28)	(41)	(42)	-

LL-NC-6

Shock Chamber Activity Data

Day

LL-NC-6

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	22(2)	52(9)	8(2)	6(1)	-	240(9)	502(3)	-
Escape	471(3)	389(15)	115(11)	116(11)	104(12)	111(3)	13(1)	-
Gen. Activity	-	30(8)	221(31)	231(22)	236(20)	189(11)	25(2)	-
Pacing	5(1)	22(3)	46(8)	107(19)	115(14)	-	-	-
Rubbing	10(1)	46(10)	171(16)	160(15)	181(19)	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	48(3)	22(3)	26(4)	16(3)	-	-	-
Kneading	37(2)	-	-	-	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(9)	(48)	(71)	(72)	(68)	(23)	(6)	-

LL-NCP-6

Shock Chamber Activity Data

Day

LL-NCP-6

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	157(14)	14(3)	207(9)	109(7)	53(5)	430(7)	379(7)	-
Escape	77(6)	-	104(8)	151(7)	51(4)	6(1)	5(1)	-
Gen. Activity	279(20)	55(5)	188(17)	226(16)	243(17)	95(3)	153(7)	-
Pacing	-	-	-	-	51(5)	-	-	-
Rubbing	-	-	2(1)	35(5)	122(14)	-	3(1)	-
Trembling	-	-	-	-	-	324(6)	-	-
Horripilation	-	-	-	-	-	69(2)	-	-
Grooming	6(1)	-	10(2)	-	-	-	-	-
Kneading	-	-	-	-	-	-	-	-
Playing	27(1)	471(4)	29(3)	19(2)	71(7)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(42)	(12)	(40)	(37)	(52)	(19)	(16)	-

LL-CNF-6

Shock Chamber Activity Data

Day

LL-CNF-6

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	82(10)	-	-	25(2)	57(5)	141(5)	117(6)	-
Escape	109(11)	87(11)	8(1)	8(1)	-	-	-	-
Gen. Activity	165(19)	78(9)	510(7)	356(27)	272(24)	126(8)	161(7)	-
Pacing	-	147(24)	-	6(1)	-	74(5)	38(1)	-
Rubbing	213(24)	243(30)	22(5)	145(25)	211(21)	89(4)	129(5)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	-	-	-	60(2)	47(2)	-
Kneading	-	52(6)	-	-	-	-	-	-
Playing	-	-	-	-	-	112(4)	86(2)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(64)	(80)	(13)	(56)	(50)	(28)	(23)	-

LL-CON-7

Shock Chamber Activity Data

Day

LL-CON-7

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	11(3)	-	-	-	-	324(11)	90(7)	75(6)
Escape	136(17)	43(7)	-	-	-	-	-	-
Gen. Activity	116(22)	59(15)	66(19)	195(38)	125(22)	105(15)	255(28)	315(42)
Pacing	-	109(27)	-	-	-	-	-	-
Rubbing	205(18)	320(33)	412(23)	256(43)	182(24)	49(8)	107(21)	56(29)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	-	6(2)	18(1)	36(2)	-	3(1)
Kneading	118(11)	152(14)	326(15)	132(24)	74(10)	3(1)	8(1)	71(20)
Playing	-	-	2(1)	-	148(5)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	23(6)	81(14)	10(3)
Total:	(71)	(96)	(58)	(107)	(60)	(43)	(71)	(101)

LL-NC-7

Shock Chamber Activity Data

Day

LL-NC-7

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	106(9)	151(18)	26(5)	14(1)	19(4)	416(4)	484(5)	411(11)
Escape	5(1)	-	5(1)	15(2)	-	-	-	-
Gen. Activity	232(16)	159(22)	228(29)	114(17)	114(22)	21(3)	38(6)	105(9)
Pacing	-	-	-	3(1)	-	-	-	-
Rubbing	166(14)	155(15)	193(19)	235(21)	315(28)	-	16(4)	24(5)
Trembling	-	-	-	-	-	3(1)	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	12(1)	61(4)	46(1)	7(1)	-	2(1)	-
Kneading	56(9)	75(5)	25(3)	247(17)	227(16)	-	-	-
Playing	-	-	7(1)	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(49)	(61)	(62)	(60)	(71)	(8)	(16)	(25)

LL-NCP-7

Shock Chamber Activity Data

LL-NCP-7

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	540(1)	540(1)	540(1)	295(8)	22(3)	11(2)	540(1)	540(1)
Escape	-	-	-	5(1)	-	-	-	-
Gen. Activity	-	-	-	174(11)	250(16)	302(9)	-	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	95(13)	2(1)	-	-
Trembling	-	54(1)	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	-	23(1)	2(1)	-	-	-
Kneading	-	-	-	-	66(9)	-	-	-
Playing	-	-	-	43(4)	109(5)	225(8)	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(1)	(2)	(1)	(25)	(47)	(20)	(1)	(1)

LL-CNF-7

Shock Chamber Activity Data

Day

LL-CNF-7

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	5(1)	79(7)	193(20)	-	37(8)	76(9)	215(15)	117(9)
Escape	6(1)	29(4)	11(2)	4(1)	-	-	-	-
Gen. Activity	143(11)	266(14)	68(12)	91(11)	35(5)	136(10)	147(14)	188(8)
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	6(1)	9(1)	-	7(1)	7(1)	-	-	14(1)
Kneading	-	-	-	-	26(1)	47(3)	-	18(1)
Playing	380(11)	163(9)	268(19)	438(12)	435(12)	281(11)	178(13)	203(12)
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(25)	(35)	(53)	(25)	(27)	(33)	(42)	(31)

Shock Chamber Activity Data

HH-CON-1

HH-CON-1

<u>Shock Chamber Activity Data</u>

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	46 (5)	21 (2)	8 (2)	286 (14)	50 (5)	219 (7)	39 (2)	16 (3)
Escape	40 (6)	5 (1)	41 (6)	-	36 (5)	-	47 (8)	27 (1)
Gen. Activity	96 (15)	80 (11)	47 (5)	133 (14)	53 (12)	91 (12)	33 (2)	5 (1)
Pacing	254 (20)	14 (2)	96 (15)	5 (2)	107 (14)	139 (8)	281 (14)	104 (13)
Rubbing	302 (25)	106 (7)	110 (18)	5 (1)	100 (13)	122 (10)	298 (22)	256 (19)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	41 (5)	362 (12)	48 (5)	41 (2)	56 (2)	8 (3)	211 (5)
Kneading	93 (13)	390 (16)	52 (2)	67 (6)	206 (17)	-	174 (12)	24 (4)
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	58 (9)	9 (4)	27 (4)
Total:	(84)	(43)	(60)	(42)	(68)	(48)	(67)	(50)

HH-NC-1

Shock Chamber Activity Data

Day

HH-NC-1

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	48(8)	16(3)	3(1)	11(1)	120(11)	505(4)	110(12)	540(1)
Escape	463(15)	406(15)	345(15)	264(16)	266(15)	25(2)	142(11)	-
Gen. Activity	76(13)	116(17)	182(14)	285(19)	153(16)	6(1)	187(19)	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	11(2)	12(4)	3(1)	-	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	71(2)	-	-
Grooming	4(2)	-	13(1)	-	-	4(1)	85(3)	-
Kneading	-	3(1)	-	3(1)	-	-	28(2)	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	(7)	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(40)	(40)	(32)	(37)	(42)	(10)	(47)	(1)

HH-NCP-1

Shock Chamber Activity Data

Day

HH-NCP-1

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	9 (2)	10 (2)	-	4 (1)	55 (7)	419 (9)	118 (7)	161 (13)
Escape	462 (14)	185 (20)	261 (26)	224 (20)	194 (14)	23 (3)	325 (10)	23 (1)
Gen. Activity	5 (1)	61 (13)	125 (21)	168 (25)	192 (23)	110 (8)	288 (13)	221 (22)
Pacing	14 (4)	236 (35)	149 (27)	121 (22)	32 (6)	-	-	26 (4)
Rubbing	58 (10)	224 (38)	135 (28)	130 (23)	38 (7)	-	-	117 (12)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	-	-	-	-	-	-
Kneading	-	158 (20)	32 (3)	36 (7)	130 (10)	-	-	68 (7)
Playing	-	-	-	-	17 (1)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(31)	(128)	(105)	(98)	(68)	(20)	(30)	(59)

Shock Chamber Activity Data

HH-CNF-1

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	388(3)	206(5)	192(22)	202(14)	131(13)	86(8)	-	52(2)
Escape	71(1)	14(1)	16(1)	122(8)	34(3)	43(3)	66(7)	19(2)
Gen. Activity	18(2)	119(3)	109(11)	203(16)	257(15)	303(8)	193(13)	202(8)
Pacing	-	-	-	-	-	-	123(9)	70(2)
Rubbing	-	-	-	-	3(1)	-	265(15)	198(4)
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	63(1)	201(2)	223(19)	13(2)	115(4)	24(1)	35(4)	32(1)
Kneading	-	-	-	-	-	5(1)	-	-
Playing	-	-	-	-	-	84(7)	-	37(1)
Quivering	-	-	(1)	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(7)	(11)	(54)	(40)	(36)	(28)	(48)	(20)

HH-CON-2

Shock Chamber Activity Data

HH-CON-2

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	50 (9)	61 (8)	41 (6)	133 (6)	135 (6)	150 (12)	2 (1)	-
Escape	197 (14)	82 (12)	81 (11)	35 (6)	20 (3)	46 (8)	43 (7)	-
Gen. Activity	80 (10)	156 (15)	78 (13)	71 (13)	21 (2)	57 (8)	151 (13)	-
Pacing	149 (13)	185 (15)	293 (25)	158 (14)	263 (10)	187 (13)	317 (17)	-
Rubbing	140 (17)	158 (17)	303 (28)	168 (15)	298 (10)	225 (14)	220 (18)	-
Trembling	-	-	-	-	-	3 (1)	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	64 (11)	224 (15)	30 (1)	120 (4)	41 (4)	-	-	-
Kneading	-	-	-	27 (4)	189 (5)	75 (10)	13 (1)	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	(5)	(4)	(6)	-	-	-	-
Approach	-	-	-	-	-	45 (14)	22 (12)	-
Total:	(74)	(87)	(88)	(68)	(40)	(80)	(69)	-

HH-NC-2

Shock Chamber Activity Data

HH-NC-2

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	55(5)	49(3)	66(9)	70(8)	104(11)	507(5)	311(5)	-
Escape	218(13)	13(2)	57(7)	49(4)	68(7)	20(2)	-	-
Gen. Activity	91(11)	208(7)	255(15)	382(11)	231(16)	-	14(2)	-
Pacing	124(14)	6(1)	-	8(1)	-	-	-	-
Rubbing	127(17)	3(1)	-	8(1)	-	-	-	-
Trembling	-	-	-	-	-	13(2)	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	29(3)	264(1)	162(1)	31(1)	137(4)	-	215(4)	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	(26)	(51)	(34)	(55)	-	(3)	-
Approach	-	-	-	-	-	-	-	-
Total:	(63)	(41)	(83)	(60)	(93)	(9)	(14)	

Shock Chamber Activity Data

HH-NCP-2

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	5(2)	44(8)	16(5)	-	15(2)	540(1)	292(8)	-
Escape	252(21)	219(20)	181(20)	148(22)	142(13)	-	67(5)	-
Gen. Activity	86(12)	149(13)	140(22)	77(15)	56(11)	-	176(12)	-
Pacing	197(23)	90(11)	50(9)	193(26)	124(17)	-	-	-
Rubbing	139(21)	95(12)	50(10)	182(26)	124(17)	-	-	-
Trembling	-	-	-	-	-	30(3)	42(2)	-
Horripilation	-	-	-	-	-	28(2)	-	-
Grooming	-	5(2)	12(3)	-	-	-	-	-
Kneading	-	15(4)	4(1)	84(18)	167(14)	-	5(1)	-
Playing	-	-	134(6)	45(1)	80(6)	-	-	-
Quivering	-	-	-	-	-	-	(10)	-
Approach	-	-	-	-	-	-	-	-
Total:	(69)	(70)	(76)	(108)	(80)	(6)	(38)	-

HH-CNF-2

Shock Chamber Activity Data

<u>Shock Chamber Activity Data</u>

	Day							
<u>Measure</u>:	1	2	3	4	5	S1	S2	S3
Inactivity	60(8)	15(3)	74(13)	197(9)	174(8)	94(12)	195(5)	-
Escape	184(21)	46(4)	212(19)	108(15)	74(5)	48(6)	64(4)	-
Gen. Activity	175(18)	146(10)	187(26)	234(22)	92(11)	200(10)	142(11)	-
Pacing	-	-	16(3)	-	-	76(10)	77(8)	-
Rubbing	4(1)	5(1)	39(7)	-	3(1)	78(10)	65(8)	-
Trembling	3(1)	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	100(8)	328(6)	18(7)	3(1)	197(5)	118(7)	58(4)	-
Kneading	17(3)	-	14(2)	-	-	-	4(1)	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	(6)	(22)	(23)	(7)	-
Approach	-	-	-	-	-	-	-	-
Total:	(60)	(24)	(77)	(53)	(52)	(78)	(48)	-

VII CON-3

Shock Chamber Activity Data

HH-CON-3

Shock Chamber Activity Data

	Day							
	1	2	3	4	5	S1	S2	S3
Measure:								
Inactivity	23(7)	8(2)	37(4)	196(13)	211(16)	285(14)	89(6)	-
Escape	202(23)	168(21)	295(18)	137(17)	169(14)	17(2)	137(14)	-
Gen. Activity	203(22)	270(23)	131(14)	173(19)	110(13)	78(10)	123(12)	-
Pacing	45(9)	77(15)	78(11)	6(1)	2(1)	-	6(1)	-
Rubbing	79(13)	78(16)	78(11)	6(1)	15(5)	11(1)	93(12)	-
Trembling	-	6(1)	-	-	-	-	15(1)	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	2(1)	-	18(2)	33(5)	126(4)	87(7)	-
Kneading	-	3(1)	-	10(2)	-	-	-	-
Playing	33(3)	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	(2)	-	-
Approach	-	-	-	-	-	23(3)	-	-
Total:	(77)	(80)	(58)	(55)	(54)	(36)	(53)	-

Shock Chamber Activity Data

HH-NC-3

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	135(14)	220(7)	308(8)	368(12)	249(10)	453(5)	540(1)	-
Escape	48(6)	34(3)	41(4)	-	-	69(2)	-	-
Gen. Activity	78(9)	129(9)	36(6)	120(11)	52(4)	18(4)	-	-
Pacing	-	9(2)	11(2)	3(1)	-	-	-	-
Rubbing	14(4)	11(2)	13(3)	3(1)	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	119(4)	81(3)	142(2)	49(3)	239(5)	-	-	-
Kneading	-	-	-	-	-	-	-	-
Playing	147(8)	65(2)	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(45)	(28)	(25)	(28)	(19)	(11)	(1)	-

HH-NCP-3

Shock Chamber Activity Data

HH-NCP-3

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	56(10)	55(2)	74(6)	134(14)	337(6)	510(6)	417(9)	-
Escape	150(14)	39(4)	240(18)	101(15)	60(6)	20(3)	30(3)	-
Gen. Activity	197(13)	388(7)	170(14)	236(20)	113(10)	10(1)	26(2)	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	479(4)	-
Horripilation	-	-	-	-	-	-	171(1)	-
Grooming	-	-	35(5)	16(1)	2(1)	-	17(1)	-
Kneading	-	-	-	47(6)	-	-	-	-
Playing	137(6)	58(4)	21(2)	7(1)	28(2)	-	-	-
Quivering	-	-	-	-	(4)	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(43)	(17)	(45)	(57)	(29)	(10)	(20)	-

HH-NCP-3

<u>Shock Chamber Activity Data</u>

Day

HH-NCP-3

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	56(10)	55(2)	74(6)	134(14)	337(6)	510(6)	417(9)	-
Escape	150(14)	39(4)	240(18)	101(15)	60(6)	20(3)	30(3)	-
Gen. Activity	197(13)	388(7)	170(14)	236(20)	113(10)	10(1)	26(2)	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	479(4)	-
Horripilation	-	-	-	-	-	-	171(1)	-
Grooming	-	-	35(5)	16(1)	2(1)	-	17(1)	-
Kneading	-	-	-	47(6)	-	-	-	-
Playing	137(6)	58(4)	21(2)	7(1)	28(2)	-	-	-
Quivering	-	-	-	-	(4)	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(43)	(17)	(45)	(57)	(29)	(10)	(20)	-

HH-CNF-3

Shock Chamber Activity Data

HH-CNF-3

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	66(8)	48(5)	72(14)	87(15)	165(13)	147(10)	310(9)	-
Escape	191(15)	109(18)	197(19)	117(11)	69(6)	-	5(1)	-
Gen. Activity	170(14)	191(20)	176(22)	182(19)	219(18)	272(13)	81(10)	-
Pacing	25(3)	38(9)	41(8)	11(3)	-	9(4)	-	-
Rubbing	43(8)	38(9)	47(9)	22(6)	6(2)	3(1)	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	33(1)	138(7)	30(5)	32(4)	-	3(1)	71(5)	-
Kneading	-	-	-	113(15)	86(7)	106(12)	73(6)	-
Playing	41(5)	11(2)	4(1)	-	-	-	-	-
Quivering	-	-	-	-	-	(10)	(1)	-
Approach	-	-	-	-	-	-	-	-
Total:	(54)	(70)	(78)	(73)	(46)	(51)	(32)	-

HH-CON-4

Shock Chamber Activity Data

HH-CON-4

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	123(11)	60(10)	15(3)	94(13)	519(3)	333(12)	316(10)	-
Escape	223(16)	210(16)	129(14)	8(1)	-	-	14(1)	-
Gen. Activity	167(18)	112(15)	326(17)	225(15)	21(2)	34(2)	138(8)	-
Pacing	-	7(2)	-	-	-	-	-	-
Rubbing	6(1)	6(2)	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	331(3)	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	21(2)	145(9)	70(3)	213(12)	-	166(10)	-	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	(8)	-	(3)	(2)	-
Approach	-	-	-	-	-	7(1)	66(10)	-
Total:	(48)	(54)	(37)	(49)	(5)	(28)	(34)	-

Shock Chamber Activity Data

HH-NC-4

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	130(16)	11(3)	24(7)	38(6)	78(9)	309(12)	185(11)	-
Escape	199(17)	55(6)	103(13)	69(7)	90(9)	8(1)	62(5)	-
Gen. Activity	81(18)	104(9)	119(13)	199(16)	224(19)	16(3)	104(7)	-
Pacing	26(7)	32(3)	154(18)	13(2)	4(1)	-	-	-
Rubbing	67(10)	41(4)	163(18)	13(2)	4(1)	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	54(2)	332(7)	130(7)	220(7)	143(8)	207(8)	189(6)	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	(20)	(16)	(3)	(16)	-
Approach	-	-	-	-	-	-	-	-
Total:	(70)	(32)	(76)	(60)	(63)	(27)	(45)	-

Shock Chamber Activity Data

HH-NCP-4

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	243(17)	300(14)	300(13)	407(6)	413(7)	495(3)	540(1)	-
Escape	248(19)	112(17)	79(8)	50(6)	21(2)	45(3)	-	-
Gen. Activity	38(6)	90(17)	128(20)	83(9)	101(7)	-	-	-
Pacing	-	13(4)	14(3)	-	-	-	-	-
Rubbing	11(4)	42(11)	33(5)	-	5(2)	-	-	-
Trembling	-	-	-	-	-	-	217(5)	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	-	-	-	-	-	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(46)	(63)	(49)	(21)	(18)	(6)	(6)	-

HH-CNF-4

Shock Chamber Activity Data

HH-CNF-4

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	213(11)	190(8)	118(6)	171(7)	143(7)	113(6)	134(4)	-
Escape	23(3)	40(2)	-	-	27(1)	-	4(1)	-
Gen. Activity	120(4)	103(8)	148(9)	141(7)	88(6)	162(8)	140(9)	-
Pacing	-	-	33(1)	39(3)	-	19(4)	-	-
Rubbing	-	27(2)	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	120(6)	111(4)	57(4)	97(4)	143(4)	163(3)	130(2)	-
Kneading	-	-	-	-	-	-	-	-
Playing	64(2)	69(3)	184(3)	92(3)	139(5)	83(3)	132(5)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(26)	(27)	(23)	(24)	(23)	(24)	(21)	-

Shock Chamber Activity Data

HH-CON-5

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	330(10)	135(15)	205(14)	22(4)	66(8)	462(4)	515(4)	-
Escape	9(1)	79(9)	3(1)	5(1)	-	-	-	-
Gen. Activity	188(10)	102(12)	112(13)	182(15)	188(17)	78(4)	25(3)	-
Pacing	-	29(3)	-	-	-	-	-	-
Rubbing	10(2)	141(21)	-	13(3)	12(3)	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	3(1)	-	31(5)	24(6)	69(8)	-	-	-
Kneading	-	57(8)	9(2)	33(4)	31(2)	-	-	-
Playing	-	31(2)	180(13)	261(9)	174(12)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(24)	(70)	(48)	(42)	(50)	(8)	(7)	-

HH-NC-5

Shock Chamber Activity Data

HH-NC-5

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	105(7)	32(6)	11(3)	35(1)	82(6)	521(2)	540(1)	-
Escape	59(11)	-	214(14)	-	-	-	-	-
Gen. Activity	257(25)	325(22)	191(23)	191(18)	167(15)	19(2)	-	-
Pacing	-	2(1)	-	-	-	-	-	-
Rubbing	81(14)	86(12)	32(5)	81(13)	119(17)	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	41(7)	14(2)	15(2)	-	-	-
Kneading	38(6)	96(17)	34(5)	201(18)	179(16)	-	-	-
Playing	-	-	27(3)	25(2)	5(1)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(63)	(58)	(60)	(54)	(57)	(4)	(1)	-

HH-NCP-5

Shock Chamber Activity Data

HH-NCP-5

<u>Shock Chamber Activity Data</u>

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	244(10)	85(7)	36(4)	33(7)	51(9)	349(3)	136(5)	-
Escape	20(2)	22(3)	-	36(3)	-	32(1)	-	-
Gen. Activity	178(6)	71(11)	134(19)	177(25)	94(9)	159(3)	266(13)	-
Pacing	-	3(1)	-	-	-	-	-	-
Rubbing	-	122(12)	154(20)	128(23)	17(2)	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	90(9)	15(1)	62(6)	40(4)	84(8)	-	94(7)	-
Kneading	-	277(13)	166(12)	124(18)	10(1)	-	-	-
Playing	8(1)	-	66(4)	38(4)	284(11)	-	44(4)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(28)	(48)	(65)	(84)	(40)	(6)	(29)	-

HH-CNF-5

Shock Chamber Activity Data

HH-CNF-5

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	436(1)	239(4)	103(4)	81(6)	126(4)	120(5)	115(7)	-
Escape	-	117(6)	62(3)	11(1)	-	-	-	-
Gen. Activity	60(1)	184(8)	206(9)	178(10)	115(7)	180(10)	152(13)	-
Pacing	-	-	8(1)	3(1)	25(2)	28(1)	23(2)	-
Rubbing	-	-	23(1)	15(1)	47(2)	29(2)	9(2)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	44(1)	-	32(1)	134(3)	103(3)	69(1)	87(4)	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	114(4)	118(5)	139(5)	131(7)	176(6)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(3)	(18)	(23)	(27)	(23)	(26)	(34)	-

HH-CON-6

Shock Chamber Activity Data

HH-CON-6

<u>Shock Chamber Activity Data</u>

	Day							
<u>Measure</u>:	1	2	3	4	5	S1	S2	S3
Inactivity	106(10)	126(14)	228(8)	65(9)	182(14)	289(7)	397(11)	-
Escape	-	-	11(1)	6(1)	-	-	-	-
Gen. Activity	52(6)	178(9)	168(8)	201(14)	-	53(1)	51(4)	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	27(7)	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	382(11)	236(13)	133(7)	225(8)	358(13)	198(7)	92(7)	-
Kneading	-	-	-	16(4)	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(27)	(36)	(24)	(43)	(27)	(15)	(22)	-

Shock Chamber Activity Data

HH-NC-6

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	89(5)	27(4)	25(6)	2(1)	23(4)	179(7)	13(2)	-
Escape	35(1)	74(11)	128(14)	62(10)	62(8)	220(7)	69(9)	-
Gen. Activity	231(8)	232(17)	233(25)	215(32)	236(36)	141(12)	359(28)	-
Pacing	-	80(7)	-	-	-	-	-	-
Rubbing	-	-	5(1)	70(14)	90(20)	-	82(20)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	-	-	-	4(1)	-	-	3(1)	-
Kneading	-	-	40(6)	82(12)	30(3)	-	-	-
Playing	185(4)	127(7)	109(5)	109(10)	99(11)	-	18(1)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(18)	(46)	(57)	(80)	(82)	(26)	(60)	-

Shock Chamber Activity Data

HH-NCP-6

Shock Chamber Activity Data

Measure:	Day 1	2	3	4	5	S1	S2	S3
Inactivity	155(15)	86(11)	80(8)	95(5)	15(4)	463(6)	504(5)	-
Escape	-	7(1)	19(3)	57(7)	21(2)	27(2)	13(1)	-
Gen. Activity	136(8)	195(14)	263(22)	299(21)	301(23)	29(1)	-	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	6(2)	8(2)	3(2)	7(1)	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	249(13)	231(13)	161(16)	31(5)	132(15)	21(3)	23(3)	-
Kneading	-	-	9(1)	36(8)	14(2)	-	-	-
Playing	-	-	-	19(1)	50(6)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(36)	(41)	(52)	(49)	(53)	(12)	(9)	-

Shock Chamber Activity Data

HH-CNF-6

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	441(5)	168(4)	70(4)	46(2)	135(5)	147(1)	46(1)	-
Escape	-	36(2)	-	36(3)	-	13(1)	-	-
Gen. Activity	25(2)	110(13)	101(10)	204(11)	144(9)	149(10)	184(7)	-
Pacing	-	82(6)	34(3)	56(4)	-	72(4)	32(2)	-
Rubbing	-	80(5)	86(3)	44(5)	19(2)	-	52(1)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	74(3)	46(2)	43(2)	35(1)	83(4)	10(1)	41(1)	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	77(5)	238(9)	138(6)	159(6)	149(5)	209(5)	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(10)	(37)	(31)	(32)	(26)	(22)	(17)	-

Shock Chamber Activity Data

HH-CON-7

<u>Shock Chamber Activity Data</u>

	Day							
<u>Measure</u>:	1	2	3	4	5	S1	S2	S3
Inactivity	121(4)	37(3)	47(4)	4(1)	37(4)	404(7)	363(10)	-
Escape	-	7(2)	21(3)	99(15)	60(7)	-	71(4)	-
Gen. Activity	96(7)	163(9)	119(14)	123(28)	94(16)	136(7)	91(11)	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	3(1)	55(9)	117(22)	86(6)	-	8(2)	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	37(2)	2(1)	27(1)	16(2)	-	-	7(3)	-
Kneading	-	-	74(6)	122(16)	75(4)	-	-	-
Playing	286(7)	328(7)	241(7)	64(4)	220(16)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(20)	(23)	(44)	(88)	(53)	(14)	(30)	-

Shock Chamber Activity Data

HH-NC-7

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	160(6)	222(9)	111(8)	257(17)	344(5)	243(7)	515(3)	–
Escape	48(4)	7(1)	15(2)	22(3)	–	28(2)	–	–
Gen. Activity	154(15)	188(7)	282(12)	147(21)	44(3)	269(6)	25(2)	–
Pacing	–	–	–	–	–	–	–	–
Rubbing	83(10)	56(4)	6(1)	25(6)	–	–	–	–
Trembling	–	–	–	–	–	–	–	–
Horripilation	–	–	–	–	–	–	–	–
Grooming	36(3)	67(5)	122(7)	66(8)	152(1)	–	–	–
Kneading	79(8)	–	4(1)	23(4)	–	–	–	–
Playing	–	–	–	–	–	–	–	–
Quivering	–	–	–	–	–	–	–	–
Approach	–	–	–	–	–	–	–	–
Total:	(46)	(26)	(31)	(59)	(9)	(15)	(5)	–

Shock Chamber Activity Data

HH-NCP-7

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	143(7)	177(8)	127(10)	60(6)	53(5)	535(2)	533(3)	-
Escape	-	-	-	47(7)	60(10)	-	7(2)	-
Gen. Activity	208(7)	111(9)	154(12)	210(10)	130(18)	5(1)	-	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	-	-	-	-	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	108(1)	-	-
Grooming	23(1)	5(1)	117(5)	-	-	-	-	-
Kneading	-	-	-	10(1)	11(2)	-	-	-
Playing	166(9)	247(11)	142(11)	213(11)	286(15)	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(24)	(29)	(37)	(35)	(50)	(4)	(5)	-

Shock Chamber Activity Data

HH-CNF-7

Shock Chamber Activity Data

	Day							
Measure:	1	2	3	4	5	S1	S2	S3
Inactivity	132(10)	135(6)	131(6)	27(3)	28(3)	114(6)	129(7)	-
Escape	75(6)	-	9(1)	-	-	-	-	-
Gen. Activity	84(8)	-	91(6)	3(1)	-	74(2)	97(2)	-
Pacing	-	-	-	-	-	-	-	-
Rubbing	47(6)	-	21(4)	-	-	-	-	-
Trembling	-	-	-	-	-	-	-	-
Horripilation	-	-	-	-	-	-	-	-
Grooming	234(4)	405(7)	288(5)	510(3)	512(4)	252(7)	314(6)	-
Kneading	-	-	-	-	-	-	-	-
Playing	-	-	-	-	-	-	-	-
Quivering	-	-	-	-	-	-	-	-
Approach	-	-	-	-	-	-	-	-
Total:	(34)	(13)	(22)	(7)	(7)	(15)	(15)	-