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O

A COMPREHENSIVE SCHEME FOR
DESCRIBING APOMORPHINE-INDUCED
BEHAVIOR IN RATS

by

(1)

DIANE GORDON

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A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES
AND RESEARCH IN PARTIAL FULFILMENT OF THE
REQUIREMENTS FOR THE DEGREE MASTER OF SCIENCE

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A COMPREHENSIVE SCHEME FOR DESCRIBING APOMORPHINE-INDUCED BEHAVIOR IN RATS submitted by DIANE GORDON in partial fulfilment of the requirements for the degree of Master of Science.

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Abstract

The methodology employed in studying the open-field behavior of apomorphine-treated rats (acute and chronic) and saline-treated rats was investigated. Attention was also given to the time course of the behaviors, individual differences among animals and pretest/posttest differences in reactivity among animals, both between and within the apomorphine and the saline groups. An exhaustive and exclusive set of behavioral categories was used to code behavior. Reliability estimates reflected high test-retest and interjudge agreements using this method. Multiple dependent measures were used. It was found that apomorphine resulted in increases in the common behaviors locomote, rear and sniff across days whereas the stereotypic behaviors gnaw and nod tended to decrease across days. Trial by trial intercorrelations showed that the behaviors locomote, rear and sniff were affected differentially by acute and chronic apomorphine administration whereas gnaw, nod, headdown and jump remained relatively constant across successive injections. The correlations revealed distinct patterns in the time course of the behaviors shown by the apomorphine-treated animals; no distinct patterns were found in the saline group. The apomorphine group was divided into high and low locomote groups and it was found that the high locomote group displayed predominantly the behavior locomote while the low locomote group showed predominantly the behavior gnaw.

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Introduction

Apomorphine is a commonly used agent in the study of dopaminergic function as it is generally considered a direct, dopamine receptor stimulating drug (Anden, Rubenson, Fuxe & Hokfelt, 1967; Ernst, 1967; Keababian, Petzold & Greengard, 1972; Siggins, Hoffer & Ungerstedt, 1974). In general, dopaminergic function is inferred from the behavior shown in studies of open-field behavior in rats. Since the effects of apomorphine are most often judged on the basis of behavioral observations of apomorphine-treated animals, it is here where the greatest number of questions arise as to the appropriate methodology to employ when assessing apomorphine-induced behavior.

The first question raised when using apomorphine treatment is: what behaviors does apomorphine induce? It is generally agreed that apomorphine produces stereotypy in rats (cf. Costall & Naylor, 1973; Fray Sahakian, Robbins, Koob & Iversen, 1980; Ljungberg, 1979), however, it is often unclear exactly how stereotypy is defined. That a clear and accurate description of open-field behavior is essential in differentiating drug-induced from normal behaviors was noted by Norton (1973).

Extending this suggestion, a major consideration when studying the effects of apomorphine is the nature of the comparison group. Apomorphine-induced stereotypy and changes in patterns of particular behaviors are only interesting insofar as these patterns of behavior deviate

from or mimic normal behavior. Therefore, the frequencies, durations, descriptions and time courses of the behaviors engaged in by normal animals must be as precisely defined and as carefully observed as those behaviors shown by a drug-treated group of animals.

Most often, however, comparisons of drug-treated and normal rats focus on the behavior of the drug-treated animals with the control group's behavior being referred to as that of the "saline-treated rats" with little description of the saline-treated animals' behavior (Costall & Naylor, 1973; Tolosa, Cotzias, Burckhardt, Tang & Dahl, 1977). Few studies have made comprehensive attempts to describe normal rat behavior (Draper, 1967) and the time course of that behavior (Hoglund & Meyerson, 1982; Ljungberg & Ungerstedt, 1977a; Meyerson & Hoglund, 1981) and none have described the complete behavioral repertoire of the saline-treated animal. As a consequence, no studies have directly compared the behavioral repertoires and time courses of the behaviors shown by apomorphine-treated and saline-treated rats.

Therefore, the first objective of this study was to apply an exhaustive, exclusive behavioral taxonomy to the observation of the open-field behavior of both apomorphine-treated and saline-treated animals in order to allow comparison of the types of behaviors in the animals' respective behavioral repertoires, the relative durations and frequencies of these behaviors and the relative time

courses of behaviors common to treated and untreated animals.

The most common method used to assess the behavioral effects of apomorphine is the rating scale (Butterworth & Barbeau, 1975; Friedman, Rotrosen, Gurland, Lambert & Gershon, 1975). Rating scales have been used to measure both the frequency and intensity of drug-induced behaviors (Costall & Naylor, 1973; Creese & Iversen, 1973; Ellingwood & Balster, 1974; Tolosa et al., 1977).

Rating scales typically consist of five categories scored 0 to 4 with each level representing an increment in the intensity of stereotypic behavior. The zero level is usually described as "The appearance of the animals is the same as saline treated rats" (Costall & Naylor, 1973). Category 1 represents "discontinuous sniffing, constant exploratory activity", 2 represents "continuous sniffing, periodic exploratory activity", 3 represents "continuous sniffing, discontinuous biting, gnawing or licking [with] very brief periods of locomotor activity" and 4 represents "continuous biting, gnawing or licking; no exploratory activity" (Costall & Naylor, 1973).

Two assumptions underlie the use of rating scales. The first assumption is that behaviors of increasing intensity are continuous across time and the second is that particular behaviors occur together as a behavioral composite. There is some evidence available that suggests that these assumptions are unwarranted.

Ljungberg (1979) used photocell measures to describe

two general categories of behavior. He described gnawing behavior (G) and locomote-sniff (LS) behavior. His data were expressed as frequency measures in counts/15 minutes following a 90 minute habituation period. Ljungberg (1979) found distinct time courses for the occurrences of the G and LS types of behavior where locomote occurred at a high level initially and decreased across the first 30 minutes of the observation period at which point gnaw began to increase.

The main advantages of Ljungberg's (1979) method are his attempt to record discrete behaviors and the attention paid to the time courses of the behaviors. However, since photocell recording was used to assess the category locomote-sniff, it is unclear how these two behaviors are separable in time. Therefore, in terms of the behaviors locomote and sniff, an underlying assumption of continuity, or at least coincidence, is built into the recording method and as such confounds the behaviors locomote and sniff as do rating scales.

However, the time courses found for sniff and gnaw by Ljungberg (1979) do not support the continuity assumption which is built into rating scales. Rating scales would predict that sniffing would increase in frequency across time. They would also predict that when sniffing reached maximum intensity, described as "continuous sniffing", that gnawing behavior would emerge and gradually replace sniffing behavior as a more intense form of sniffing. However,

Ljungberg (1979) found that the LS category behaviors decreased across the beginning of an observation period and only then was gnawing introduced. Once again, however, caution must be used in interpreting the time course found by Ljungberg (1979) for the behavior sniff since sniff and locomote were recorded as a composite category.

Fray et al. (1980) used interrupted scan and photocell methods of recording behavior. The interrupted scan technique consisted of making one observation every 10 minutes where all behaviors occurring at the time of each observation were recorded. The data were reported in terms of the percent of animals showing a particular behavior. Time course was also considered.

The main advantage of the study done by Fray et al. (1980), compared to that done by Ljungberg (1979), was the use of discrete behavioral categories. The use of discrete behavioral categories served to eliminate the behavioral confounding noted when behavioral composites were used.

However, Fray et al. (1980) failed to replicate Ljungberg's (1979) findings with regard to the time courses of the behaviors. Fray et al. (1980) found no distinct time courses for the behaviors locomote and gnaw; they found that both behaviors occurred throughout the observation period and sometimes that locomote and gnaw occurred in the same animal. The lack of time course reported by Fray et al. (1980) may have been due to the interrupted scan procedure they employed. Since very few

numbers of observations were made for very short periods of time for each observation, low frequency behaviors may have been missed. In addition, since the behavioral recording was interrupted, not continuous, behaviors occurring before and subsequent to the punctate observation periods were not recorded, therefore, little information with regard to the time courses of the behaviors was gained.

A third issue, with respect to the use of rating scales, is the failure of such scales to describe the saline comparison group. Without clear baseline information for comparison, the subjective nature of rating scales becomes evident. For example, a rating of 1 represents discontinuous sniffing and constant exploratory activity. This category could possibly describe saline-treated rats placed in a novel environment yet this category could also describe behavior that was more intense than that shown by saline-treated rats if the animals were habituated to the test apparatus. That two different conditions can be inferred from a single category illustrates the "sliding" nature of rating scales where categorical membership can be adjusted to adhere to different judgements of saline-treated animals' behaviors. Therefore, a major problem inherent in the use of rating scales is not only the necessity of making a judgement as to the categorical membership of a particular sequence of behavior but to also make a judgement as to the intensity of a behavior, relative to a sliding baseline, appropriate to each category.

In view of the foregoing issues, the second purpose of the present study was to use discrete, precisely defined behavioral categories to assess behavior and to use continuous recording throughout the observation periods. Using discrete behavioral categories allows the time courses of individual behaviors to be assessed and therefore circumvents the problems of composite behavioral categories such as the LS category used by Ljungberg (1979). In addition, the use of discrete behavioral categories removes the subjective judgements as to categorical membership of a particular behavior and judgements as to the intensity of a particular behavior relative to a sliding baseline since both apomorphine-treated and saline-treated animals were considered individually. An additional advantage of the present methodology lies in the use of continuous recording which, unlike Fray et al. (1980), allowed the time courses of individual behaviors and the relative time courses of different behaviors to be determined. Continuous recording also allowed the identification of low frequency and/or short duration behaviors that were missed using an interrupted scanning procedure.

In discussing the time course of expression of behaviors shown by apomorphine-treated animals, a third issue within the apomorphine literature is encountered: the distinction between the acute and chronic behavioral effects of apomorphine.

The acute effects of apomorphine on behavior have been studied by Olpe (1978) who found biting to be present after acute administration of high doses of apomorphine. Ljungberg (1979) found high levels of sniffing, gnawing and locomoting after acute administration of apomorphine as did Fray et al. (1980). However, none of these studies have compared the effects of acute and chronic apomorphine administration. Studies by Divac (1972), Ernst (1967), and Porecca, Cowan and Tallarida (1982) considered behavior induced by the chronic administration of apomorphine but failed to compare the chronic effects with the acute effects of apomorphine.

In view of the lack of reports of the behavioral effects of acute versus chronic apomorphine treatment, the third objective of this study was to apply discrete behavioral categories and continuous recording techniques to the description of the effects of acute and chronic apomorphine treatment on behavior. Such a comprehensive description of the chronic behavioral effects of apomorphine on the individual rat's behavior has not previously been done. An additional advantage of looking at both acute and chronic effects of apomorphine on an individual rat's behavior is that behaviors shown and the time courses of those behaviors under chronic treatment within a single rat allow the chronically-induced behavior to be viewed as a replication of the acutely-induced behavior of that animal.

Even if the behavior resulting from acute versus

chronic apomorphine administration is clearly described, there remains one factor which obscures the behavioral description. The obscuring factor consists of the observation that drug treatment often produces non-uniform changes in behavior in different animals (Kenny, Lynch & Leonard, 1980; Ljungberg & Ungerstedt, 1977a, 1977b).

Szechtman, Ornstein, Teitelbaum and Golani (1982) found that strain differences were responsible for different frequencies of biting and climbing behaviors in response to apomorphine. Kenny et al. (1980) found two distinct responses, "stereotyped sniffing" and "ritualized fighting" in rats tested in pairs. Conflicting results were found by Ljungberg and Ungerstedt (1977b) and Cools, Broekkamp and Van Rossum (1977). Ljungberg and Ungerstedt (1977b) found that subcutaneous injections administered in the flank region were more effective in inducing gnawing than injections into the neck region. Cools et al. (1977) found the opposite with subcutaneous neck injections being more conducive to gnawing than flank injections. However, these two studies employed different strains of rats. In view of the strain differences found by Szechtman et al. (1982), the site of injection as an explanation for the different patterns of behavior is left doubtful.

Other researchers have also noted differences among animals in response to the same apomorphine treatment. Fray et al. (1980) found that both locomotion and gnawing

occurred together throughout the test period in some of the animals treated with apomorphine. However, since the data were reported in terms of the percent of animals engaging in a particular behavior, the behavior of individual animals was obscured.

These findings were in contrast with those of Ljungberg and Ungerstedt (1977b) who found distinct time courses for the behaviors locomote and gnaw. Fray et al. (1980) attributed these different results to test box design where their test apparatus, with its wire mesh floor, provided greater opportunity for the expression of gnawing than did Ljungberg and Ungerstedt's (1977a) test apparatus. Basal activity levels (Costall, Hull & Naylor, 1980), weight of the animal (Kenny et al., 1980) and pretest handling (Riffée, Wilcox & Smith, 1979) have all been suggested as explanations for the non-uniform behavior displayed by similarly treated, apomorphine-injected rats.

Since individual variation in response to apomorphine treatment was common to all of the above studies, it may be more profitable to view these differences in terms of individual differences among animals rather than as the effects of experimental design. Accordingly, the fourth purpose of this study was to describe differences among animals, treated under constant experimental conditions, in terms of behavioral differences across the animals' entire behavioral repertoires and to determine the relative time courses of these differences in behavior.

The final consideration in the present study focuses on the observation that drug studies often employ only one measure of behavior, typically frequency, as an indication of the overall behavioral performance of the animals under observation. For example, Randrup and Munkvad (1967) described increases in frequencies of sniffing, biting and locomoting as the defining characteristics of amphetamine-induced stereotypy. Ljungberg and Ungerstedt (1977b) suggested that increased frequencies of sniffing, biting and locomoting also define apomorphine-induced stereotypy. However, as Fray et al. (1980) have found, apomorphine and amphetamine stereotypy represent distinct phenomena. Clearly, these conflicting reports suggest that frequency measures alone are not sufficiently sensitive to separate similar behaviors. This argument can be extended to suggest that dependent measures, consisting of frequency alone, may also result in the obscuring of behavioral differences between normal and drug-treated animals.

Problems with dependent measures used in behavioral studies have been recognized by Marcais, Protais, Costentin and Schwartz (1978) who suggested that duration as well as frequency of a particular behavior should be considered. Norton (197) added that temporal patterning of behaviors should be described in addition to frequency and duration and further suggested that a drug can conceivably produce an increase in the duration of a behavior without affecting

the frequency. Therefore, drug effects and individual differences may be masked due to inadequate dependent measures.

The final objective of this study was, therefore, to assess behaviors using multiple dependent measures and to determine the appropriateness of each of these measures in describing differences and similarities between drug-treated and normal animals across diverse behavioral categories. The use of multiple dependent measures should also facilitate extrapolation of the present results to other studies of apomorphine-induced behavior.

In summary, the major objective of this study was to provide a comprehensive description of the open-field behavior of apomorphine-treated and saline-treated rats. In order to attain this objective, an exhaustive group of exclusive behavioral categories applied during continuous behavioral recording was used to describe similarities and differences in the behavioral repertoires of saline-treated and apomorphine-treated animals. In addition, the time courses of these behaviors, including those due to acute and chronic apomorphine administration, were described. Further investigation of the apomorphine-treated animals' behavior was undertaken in an a posteriori investigation of individual differences among the apomorphine-treated animals. Each behavior included in the above studies was investigated using multiple dependent measures to determine the nature of the measure most appropriate to the objectives.

Method

Animals

— Twenty-nine male Sprague Dawley rats (Ellerslie Animal Farm, University of Alberta) weighing approximately 340-440 grams at the time of first testing were used. The animals were brought in two weeks in advance of behavioral testing to allow them to adjust to a reverse day-night cycle where the dark period extended from 1645 to 0200 hours. All animals were housed individually in opaque plastic box cages and were given free access to food and water. The animals were not handled by the experimenter prior to behavioral testing. The ambient temperature was maintained at 19° C with 51% relative humidity.

Apparatus

The test apparatus comprised a wooden box (55 x 66 x 64 cm) with black inner walls and floor. Thirty equally sized squares (11 x 11 cm) were marked off on the floor. Observations were made through one way glass to prevent the animal from seeing the experimenter. Light in the test room was provided by a 40 watt red light bulb suspended approximately 90 cm above the floor of the box. Behaviors were recorded by typing codes directly into a microcomputer.

Drugs

The 20 animals in the drug-treatment group were injected with apomorphine hydrochloride (Sigma) which was dissolved in a 0.9% saline vehicle immediately before

behavioral testing. The 9 control group animals were treated with 0.9% saline. Apomorphine was administered 5 mg/kg and saline was administered in a mg/kg dose. All animals were given subcutaneous injections in the right flank area on each of the four testing days.

Procedure

Behavioral testing occurred one hour after the onset of the dark cycle and time of testing was held constant for each animal across days.

Prior to behavioral testing, all animals were tested for pretest reactivity to four stimuli: poke, brush, noise and lift (see Table 1 for stimulus definitions). Reactivity to the four stimuli was assessed using a rating scale of responses ordered for an increase in intensity. The response scale, in order of increasing intensity, consisted of no reaction, orient, shudder, locomote, struggle, vocalize, jump/startle and aggress. Each response was assigned a numerical value between 1 and 8 with higher numerical values corresponding to greater intensities of response. Immediately following reactivity testing, the animals were weighed, injected and placed in the test apparatus.

Behavioral testing began after a 5-minute adaptation period. For each animal, behavioral testing spanned four, 85-minute sessions spaced 36 hours apart.

Behavioral recordings were made in blocks of 6 trials for each session (24 trials total for each animal) with

TABLE 1

Reactivity - Stimulus Definitions

POKE:	application of light pressure to the left flank area with the eraser end of a pencil
BRUSH:	movement of the long edge of a pencil in a posterior-anterior direction along the animal's fur
NOISE:	sharp rap of a pencil end against the outside of the plastic cage
LIFT:	placement of the four fingers beneath the abdomen followed by a vertical movement of the hand

each trial consisting of three 2-minute data collection periods interspaced with 1-minute inter-period intervals. Five-minute inter-trial intervals preceded each trial block. All animals were tested individually and none of the animals had exposure to the test apparatus prior to behavioral testing. Immediately subsequent to behavioral testing, all animals were assessed for posttest reactivity to four stimuli as stated above.

An exhaustive, mutually exclusive set of behavioral categories was used to describe the open-field behavior of both saline- and apomorphine-treated rats and consisted of the categories: locomote, rear, sniff, gnaw, nod, headdown, jump, groom and inactive (see Table 2 for behavioral definitions).

Test-retest and interjudge reliability were assessed by coding videotapes of both untreated and drug-treated rats. Three sets of videotapes were coded during three 2-minute data collection periods with 1-minute inter-period intervals for each tape.

Data Analysis

The raw data were blocked into four sessions (days) and each session was blocked into six trials prior to data analysis.

Measures of duration and frequency were expressed as "event" duration and "event" count, respectively. One event, with respect to duration, was comprised of the duration of one occurrence of a particular behavior. An

TABLE 2

Behavioral Definitions

LOCOMOTE:	front and hind paws crossing one line on the floor grid with all four paws on the floor (LOCOMOTE took precedence over SNIFF if sniffing occurred during locomotion)
REAR:	both front paws held above the floor or placed on the wall; animal stationary
SNIFF:	whisker movements or whisker movements and lateral head movements along the floor or wall with all four paws on the floor; animal stationary (REAR took precedence over SNIFF when the front paws were lifted off the floor)
GNAW:	grinding of bottom teeth along the floor or wall of the test apparatus with anterior-posterior head movement with the head down on the floor; animal stationary
NOD:	anterior-posterior head movements with the head down, in the absence of gnaw; animal stationary
HEADDOWN:	lower jaw extended and resting on the floor; no head movement; animal stationary
JUMP:	lifting of all four paws above the floor; animal stationary or mobile
GROOM:	licking, scratching, biting or rubbing of body parts; animal stationary
INACTIVE:	sleeping; sitting immobile with no whisker or head movement; lower jaw not extended; animal stationary

occurrence, with respect to duration, was defined as the time spent engaging in one particular behavior where the offset of the occurrence of that behavior was signalled by the onset of a different behavior. One event, with respect to frequency, was defined as one occurrence of a particular behavior. In summary, "event" was defined in terms of continuous streams of single behaviors where behavioral events were non-consecutive.

Three dependent measures were used to express the raw data: total time, event duration and event count. Total time was calculated as the total duration of non-consecutive occurrences of a particular behavior in one trial divided by the total observation time (360 seconds) in that trial. All total time measures were expressed as proportions. Event duration was calculated as the summed duration (in seconds) of non-consecutive occurrences of a behavior within one trial. Event duration was found to be skewed to the right so all measures of event duration were transformed $x = \sqrt{x + 1}$. Similarly, event count was calculated as the total number of non-consecutive occurrences of a particular behavior within one trial.

An initial analysis of variance was performed separately on each dependent measure for each behavior to determine apomorphine versus saline group differences as well as to determine patterns of behavior across sessions and trials. Subsequently, the data from all sessions were grouped together and trial by trial Pearson correlation

coefficients calculated for all 24 trials. Trial by trial intercorrelations were calculated separately for each dependent measure for each behavior. The apomorphine and saline groups were treated as distinct for the purpose of correlation.

Individual differences were assessed by dividing the apomorphine group into two subgroups: high locomote and low locomote. These two groups were created post hoc by summing mean event duration across the four sessions for each animal. The 8 animals with the highest event duration across sessions were assigned to the high locomote group and the 8 animals with lowest event duration across sessions were assigned to the low locomote group. The two dependent measures event duration and event count were used in subsequent analyses of individual differences.

An analysis of variance was performed separately for each dependent measure and each behavior for the 16 subjects comprising the high and low groups. The purpose of this analysis was to determine if the criterion for group division was appropriate as well as to determine on which behaviors, as expressed by which dependent measures, individual differences were most prominent. t-Tests between the high and low locomote groups were performed individually for each dependent measure and behavior for each of the 24 trials.

The saline and apomorphine groups were each tested for pretest and posttest reactivity to four stimuli: poke,

brush, noise and lift. Pretest-posttest differences within both the apomorphine and saline groups were assessed using the Wilcoxon matched-pairs signed ranks test for related samples. Differences in reactivity between the apomorphine and saline groups were assessed using the Mann-Whitney U-test for independent samples.

Reliability was estimated using two measures: the Kappa coefficient (Cohen, 1960) and multiple correlation across all behavioral categories coded. Both Kappa coefficients and multiple correlations were calculated for test-retest and interjudge observations of behavior.

Results

Behavioral Taxonomy

An exhaustive behavioral taxonomy for open-field observation of apomorphine-treated and saline-treated rats was developed by including behaviors reportedly associated with apomorphine-induced stereotypy (gnaw, nod, jump, locomote and headdown) and behaviors considered exploratory behaviors (sniff and rear) (Costall and Naylor, 1973; Meyerson and Hoglund, 1981). In addition, behaviors associated with untreated rats were included in the behavioral taxonomy (groom and inactive) (Meyerson and Hoglund, 1981).

Rather than categorizing the behaviors along a continuum or as part of a rating scale, each behavior was defined and recorded as a discrete unit. The collection of behaviors listed in Table 2, defined as individual units, proved exhaustive for the recording of open-field behavior in apomorphine- and saline-treated rats.

Measures of reliability supported the contention that behaviors recorded as discrete, precisely defined units would reflect high levels of agreement for both interjudge and test-retest measures.

Kappa coefficients of .76 and .85 were found for interjudge and test-retest reliability tests, respectively, using data matched across 1/60 second intervals (Appendix, Tables 127, 128). In addition, a multiple correlation of .998 was found for interjudge reliability and .996 for

test-retest reliability. The discrepancy between the two estimates of reliability was due to the conservative criteria for agreement imposed by the Kappa coefficient as well as due to the stringent matching criterion of 1/60 second.

Analysis of Variance for Drug, Session and Trial Effects

Mean values and standard errors of the means (SEM) are presented in the Appendix, Tables 26-49. The overall group means for the apomorphine and the saline groups are presented in Tables 26-28 for all behaviors for the measures total time, event duration and event count, respectively. Session means for total time are presented in Tables 29 and 30, for event duration in Tables 31 and 32 and for event count in Tables 34 and 35. Trial means are found in Tables 35-39 for total time, in Tables 40-44 for event duration and in Tables 45-49 for event count.

In general, both apomorphine- and saline-treated animals engaged in all behaviors with some important exceptions. The behaviors gnaw, nod, headdown and jump occurred only among apomorphine-treated animals while groom and inactive were restricted to the saline-treated animals. Within the apomorphine group, jump and headdown generally occurred with low frequency and short duration. The behaviors locomote, rear and sniff were evident in both the apomorphine-treated and the saline-treated groups and these three behaviors will subsequently be referred to as the "common" behaviors.

Again, in general, both groups of animals engaged in locomote, rear and sniff although the two groups often differed in total time spent engaging in these behaviors as well as in the number of occurrences of these behaviors. In addition, apomorphine-treated and saline-treated animals often differed in patterns of behavior across days (sessions) and across trials within sessions.

The punctate nature of the behavior jump indicated that event count was the most appropriate measure to be used in expressing the data for jump. Most often, jump "events" contained only single instances, not continuous streams, of jumping behavior. In addition, event duration reflected the amount of time the animal actually spent with all four paws off the floor. Since duration applied in this way was subject to error due to the reaction time of the experimenter and since the behavior jump usually occurred as a single behavior, no analyses of jump in terms of event duration are presented. Jump was analyzed for the measure total time since this measure incorporates both event count and event duration components.

Due to the general low frequency and duration of the behavior headdown, only event count and event duration measures are used in the ANOVAs with the omission of the composite measure total time.

The value .05 was set as the minimum probability level at which significance was reached for all effects analyzed in the ANOVAs.

Drug Group Main Effect. (Appendix, ANOVA: Tables 1-3, 9-11, 17-19; Mean Values(SEM): Tables 26-29) Drug group main effects (D) were assessed for those behaviors common to the apomorphine- and saline-treated groups: locomote, rear and sniff. Group differences were assessed for the three dependent measures total time, event duration and event count.

For locomote, there were significant group differences for event duration, event count and total time. On all three measures, the effects were due to the greater mean level of locomotion for the apomorphine group compared to the saline group (Figure 1).

Unlike locomote, there were no significant group differences for rear on any of the three dependent measures as well as no group effects for sniff on the dependent measures event duration and total time. However, the two groups differed significantly on the measure event count for sniff due to the relatively greater number of events of sniff shown by the apomorphine group (Figure 2).

Group comparisons were not made for the behaviors gnaw, nod, headdown and jump as these behaviors occurred exclusively in the apomorphine-treated group. In addition, since the behaviors groom and inactive occurred exclusively in the saline group, no group comparisons were possible for these behaviors.

Session Main Effect. (Appendix, ANOVA: Tables 1-25; Mean Values(SEM): Tables 29-34) Session effects (S) were

FIGURE 1
Mean Event Count for the Apomorphine and Saline Groups Across Trials for the Behavior LOCOMOTE

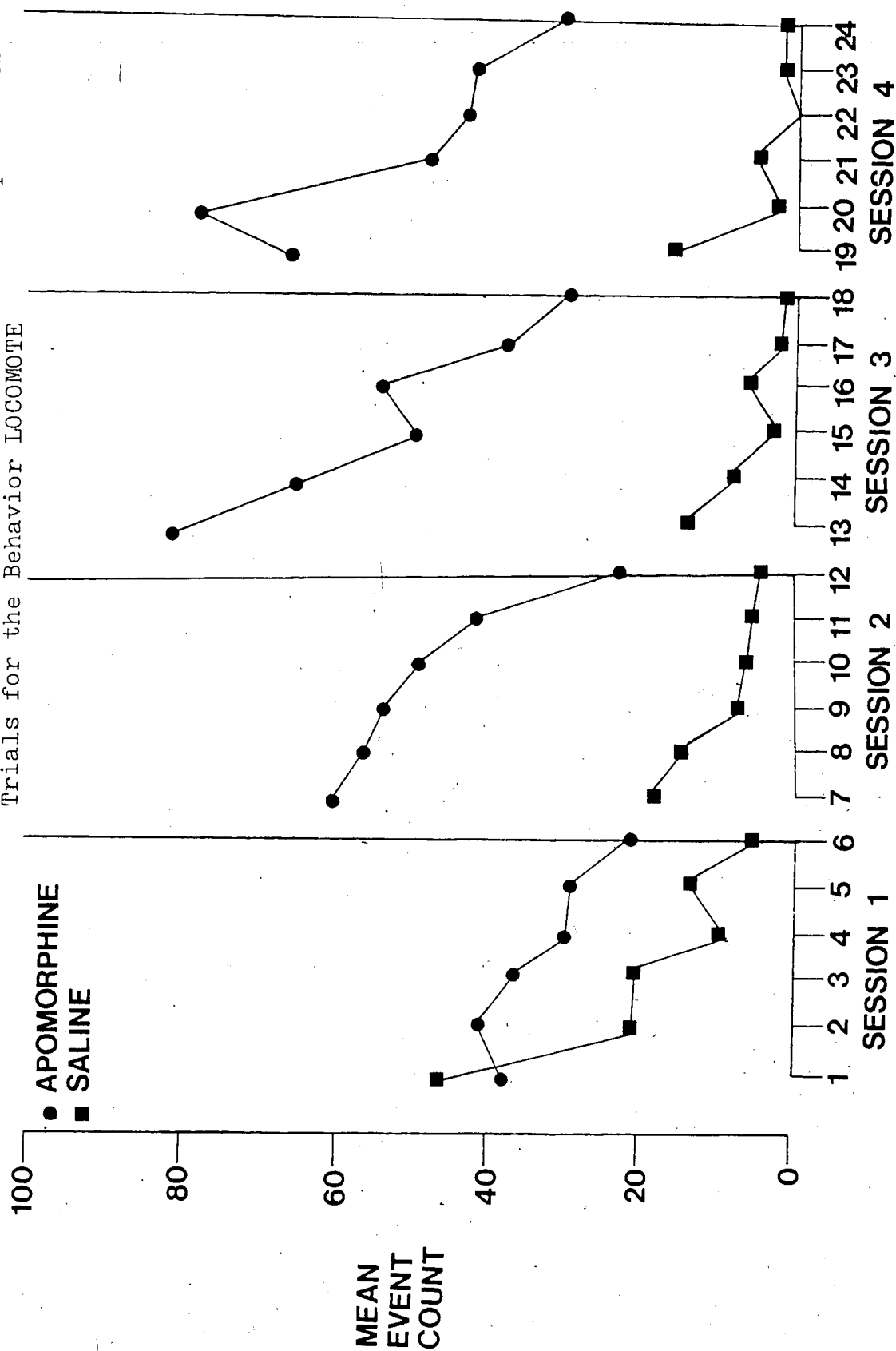
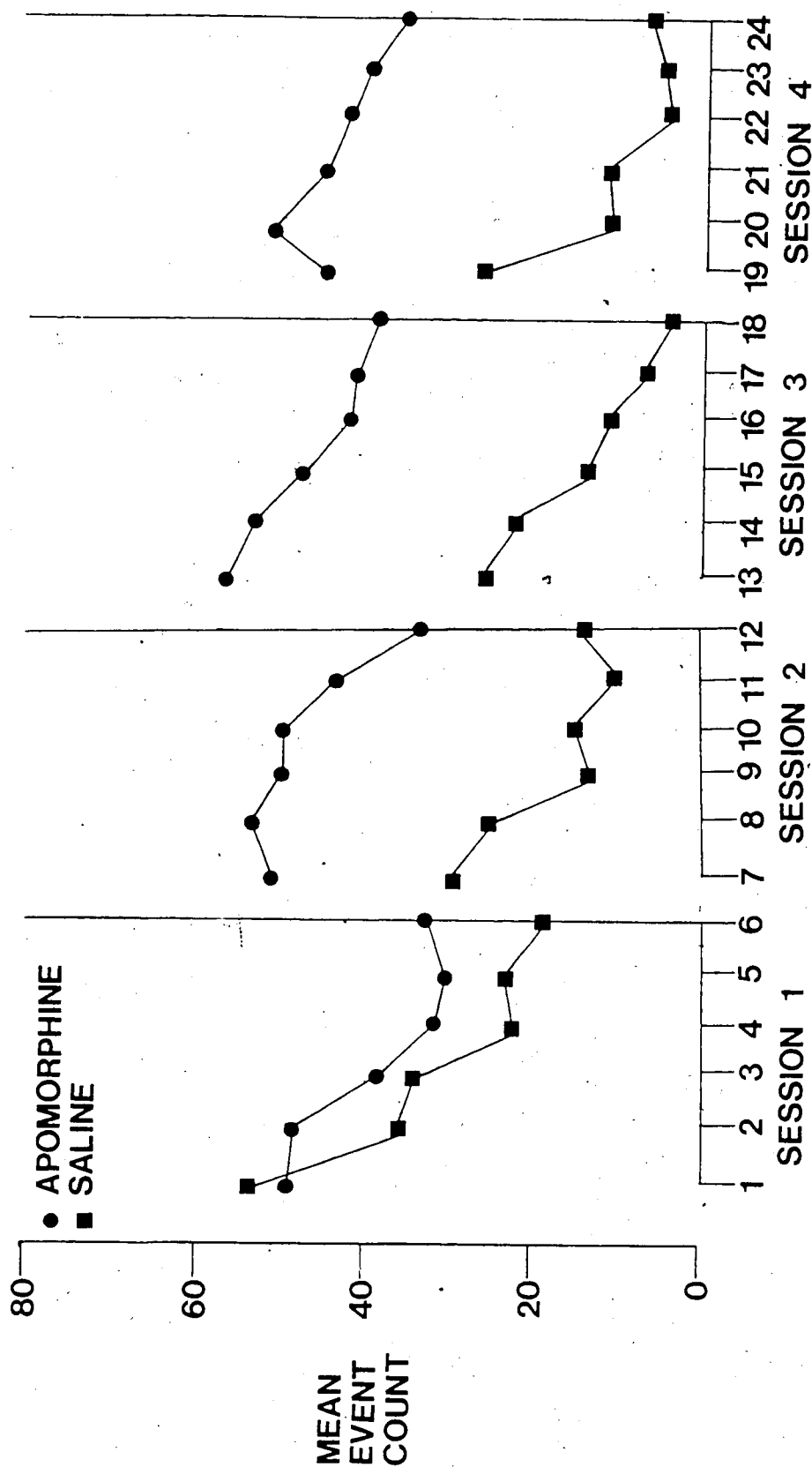


FIGURE 2
Mean Event Count for the Apomorphine and Saline Groups Across
Trials for the Behavior SNIFF



assessed for both the apomorphine and the saline groups on all behaviors for all three dependent measures. Session effects were included in the analysis of behaviors common to both the apomorphine- and saline-treated groups (locomote, sniff and rear) to assess drug-induced differences across days in comparison with normal open-field behavior across days. The purpose of this analysis was to determine the contribution of apomorphine to potential differences in the expression of behaviors that are considered part of an animal's behavioral repertoire. Within the apomorphine group, session effects were assessed to determine acute versus chronic effects across days for the behaviors exclusive to that group (gnaw, nod, headdown and jump). Session effects within the saline group were used to assess habituation patterns of behavior for saline-treated animals across days on those behaviors exclusive to the saline group (groom and inactive).

Significant session effects were found for locomote for event duration. This effect was due mainly to the increase in event duration of locomote across the first two sessions for the apomorphine group with subsequent decreases in event duration across the remaining two sessions in contrast to the relatively shorter event duration of locomote in the first session for the saline group which subsequently decreased across sessions. The saline group showed a greater decrease in mean event duration of locomote from first to last session than did the apomorphine group

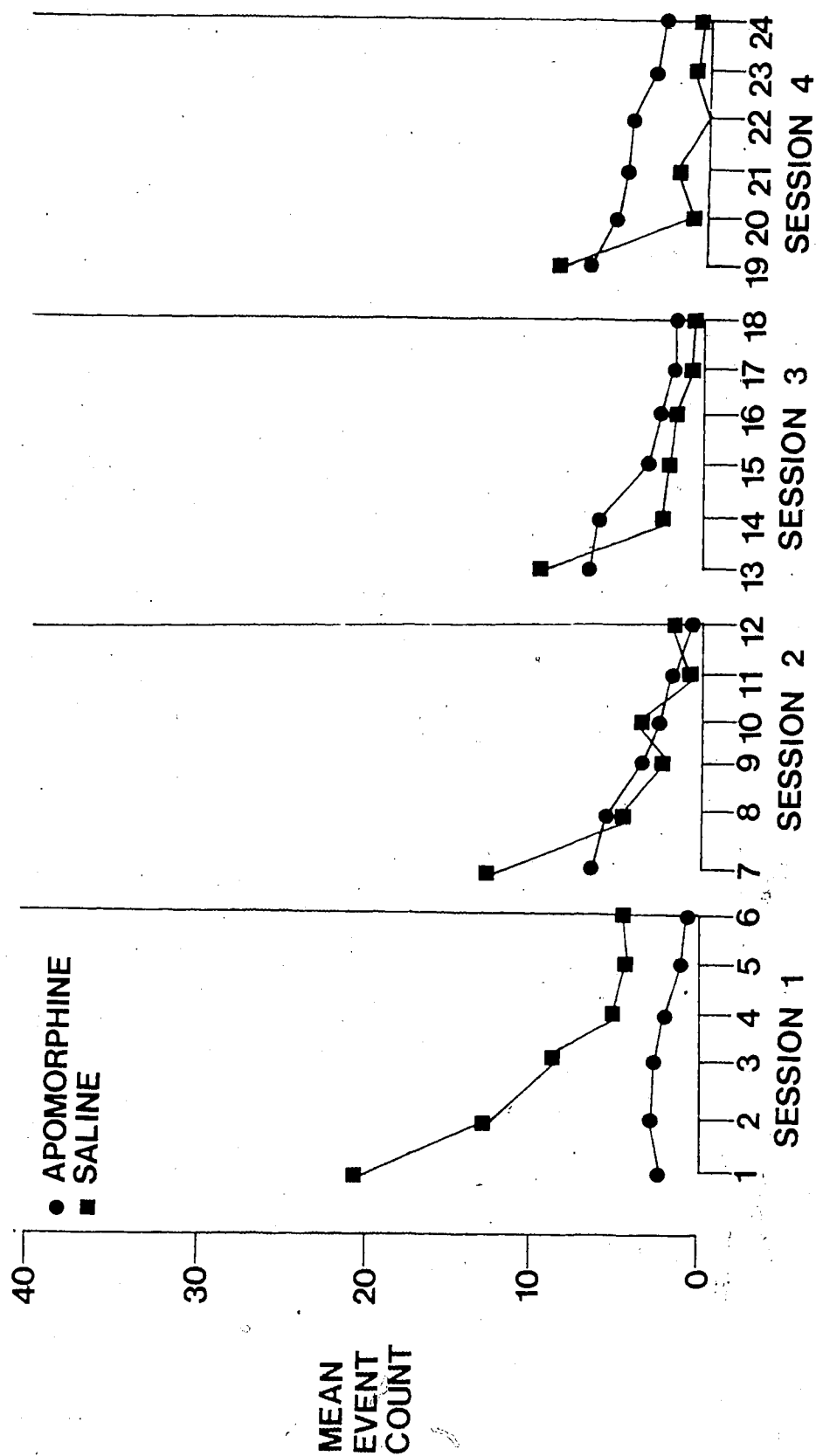
which sustained a long event duration of locomote across all four days.

No significant differences were found for session for the measures event count and total time for locomote, however, these session effects may have been masked by drug x session interactions. Both mean event count and mean total time increased across sessions for the apomorphine group whereas mean event count and mean total time decreased across sessions for the saline-treated group (see Drug X Session Interaction).

A session main effect was found for rear on the dependent measure event count (Figure 3). The mean number of events increased slightly across sessions in the apomorphine group whereas the mean number of events in the saline group decreased dramatically across sessions. The session effect was due mainly to the large magnitude of the mean event count in the first session for the saline group relative to the low mean event count in Session 1 for the apomorphine group. In addition, the magnitude of the difference between first and last session mean event counts for the saline group was much greater than that seen in the apomorphine group. As with locomote, the absence of significant session effects for event duration and total time may have been due to the opposing patterns of behavior for the two groups (see Drug X Session Interaction).

Significant session effects were found for sniff on the dependent measures event duration and event count.

FIGURE 3
Mean Event Count for the Apomorphine and Saline Groups Across Trials for the Behavior REAR



No significant session effect was found for total time. The mean event duration and mean event counts for sniff increased across the first two sessions and decreased for both measures on Sessions 3 and 4 for the apomorphine group. In contrast, both mean event duration and mean event count showed large magnitude decreases across all four sessions for the saline group. Differences in the magnitudes of mean event duration for the first and last sessions were similar for both groups as shown by the nonsignificant drug main effect for this measure.

To summarize, apomorphine treatment tended to increase the common behaviors locomote, rear and sniff across days whereas saline tended to decrease the common behaviors across days. Apomorphine-treated animals showed greater magnitudes of locomote and sniff across days than did saline-treated animals whereas saline-treated animals showed relatively higher magnitudes of rear across sessions. Some session main effects for locomote and rear were found to be obscured by drug x session interactions.

Within the apomorphine group, significant session effects were found for both gnaw and nod for total time whereas the session effect for jump for total time was not significant. Mean total time decreased across sessions for both gnaw and nod. Gnaw, nod and headdown showed significant effects for event duration. The mean event durations of gnaw and nod steadily decreased across sessions whereas the mean event duration of headdown increased across

sessions. Due to the punctate nature of each jump "event", no analysis of jump in terms of the dependent measure event duration was carried out. Significant session effects were found for gnaw, nod and jump for event count. The mean number of events decreased across sessions for gnaw and nod in contrast to jump where the mean number of events increased across sessions. No significant session effect was found for headdown for event count.

Within the saline group, significant session effects were found for event duration and event count for both groom and inactive. Inactive showed significant session effects for total time whereas there was no significant session effect for groom for total time. Across days, the mean event duration and mean event count decreased for groom, however, both measures increased across days for inactive. In addition, mean total time for groom decreased across days.

To summarize, acute apomorphine administration (Session 1) resulted in high frequency and duration of gnaw and nod whereas chronic administration (Sessions 2-4) resulted in a steady decline in these behaviors across days. The opposite pattern occurred for the behavior jump where total time and event count increased slightly across sessions. Headdown showed stable, low total time and event count across sessions with slight increases across sessions for event duration. Both headdown and jump occurred with low frequency and duration in general across days. Groom

and inactive showed opposing trends across sessions with a decrease in the frequency and duration of groom accompanied by an increase in the frequency and duration of inactive across sessions.

In summary, apomorphine tended to increase the common behaviors (locomote, rear and sniff) across sessions and to decrease drug-induced behaviors across sessions. Acute apomorphine resulted in low initial levels of the common behaviors which increased in frequency and duration with chronic apomorphine administration. However, acute apomorphine administration resulted in high levels of drug-induced behaviors (gnaw and nod) which decreased with chronic administration of apomorphine. In addition, the administration of apomorphine resulted in the introduction of jump and headdown to the animals' behavioral repertoires with both behaviors occurring at low frequency and duration across sessions, although a slight increase in the frequency of jump and the duration of headdown across sessions was noted. Apomorphine also resulted in the elimination of groom and inactive from the animals' behavioral repertoires. In contrast to apomorphine, saline tended to decrease the common behaviors across sessions (locomote, rear, sniff, as well as groom) with an accompanying increase in inactivity indicating habituation across sessions within the saline-treated group.

With respect to the dependent measures, the apomorphine group means were greater than the saline group means on all

three dependent measures for locomote and sniff and on total time and event duration for rear. However, the saline group mean was greater than the apomorphine group mean for rear on the measure event count. In addition, for each group, the pattern of increase or decrease in means across sessions tended to be reflected in all the dependent measures although the magnitudes of increase and decrease varied across measures for locomote, rear and sniff. The same pattern of changes in means was found for gnaw, nod, headdown, jump, groom and inactive where directional changes in mean values across sessions were reflected by all three dependent measures.

Trial Main Effect. (Appendix, ANOVA: Tables 1-25; Mean Values(SEM): Tables 35-49) Trial effects (T) were used to assess the pattern of occurrence of the common behaviors within days and to compare patterns within days for saline- and apomorphine-treated animals.

Significant trial effects were found for locomote on total time, event duration and event count. The apomorphine group showed high mean total time, mean event duration and mean event count on the first trial within each session. The (Trials 1, 7, 13 and 19, respectively) with steady decreases across the remaining five trials within each session. The saline group showed the same pattern of locomote across trials within each session although the mean event duration, mean event count and mean total time were of lesser magnitude than those in the apomorphine group on all 24

trials (Figure 1).

Paralleling locomote, significant trial effects were found for rear on all three dependent measures. Total time for rear decreased from the first to the last trial within each session. Mean event count and mean event duration for rear both decreased across trials within each session within the apomorphine group and within the saline group (Figure 3).

Significant trial effects were found for sniff on all three dependent measures. No consistent pattern of increase and decrease across trials was found for event duration and total time. For the saline group, no major patterns of increases and decreases across trial means for total time and event duration were found. Trial means for event count decreased across trials within each session for sniff for the apomorphine group. As with the apomorphine group, trial means tended to decrease across each session for event count for the saline group (Figure 2).

In general, for locomote and rear, trial means tended to decrease from the first to last trial within each session in both the apomorphine and saline groups on all dependent measures. No consistent patterns of increase or decrease were found for the trial means for the measures total time and event duration for sniff for the apomorphine and saline groups. For event count, trial means tended to decrease from the first to the last trial within each session for both groups.

All drug-induced behaviors showed significant trial effects for all three dependent measures with jump showing significant trial effects for event count and total time. Trial means of all dependent measures of gnaw increased from the first trial of each session to the fifth or sixth trials of each session with trial means decreasing slightly on the sixth trial within each session. Trial means also showed a similar pattern of increase across the six trials in each session for all dependent measures for nod.

Mean total time, mean event duration and mean event count tended to decrease across trials within each session for headdown. Similarly, mean event count and mean total time decreased across the six trials within each session for jump.

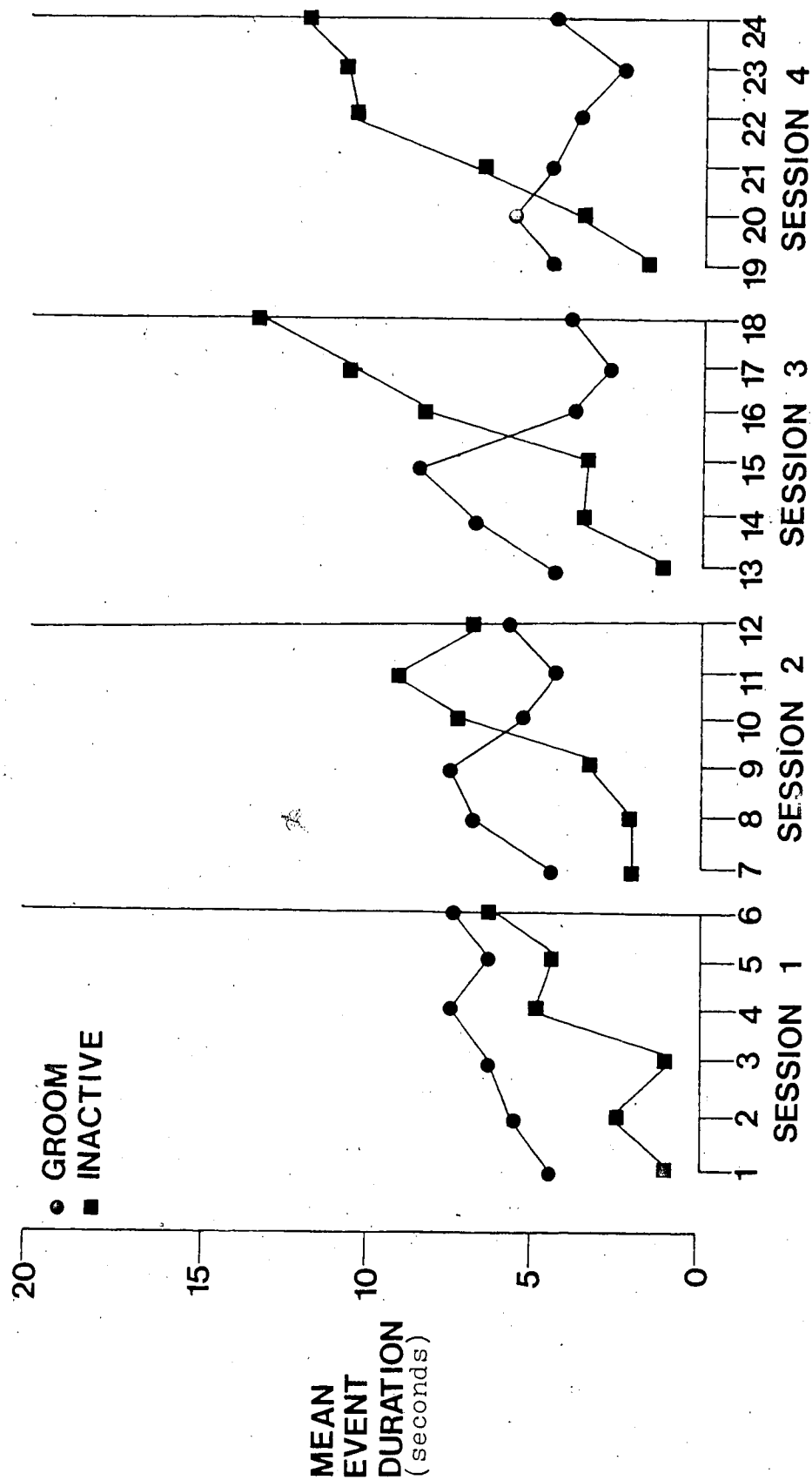
Within the saline group, significant trial effects were found for groom and inactive for the dependent measures event duration and event count and for inactive on the dependent measure total time. The trial effect was not significant for groom for total time. In general, mean event duration for groom increased across the first three trials within each session and subsequently decreased across the final three trials within each session. Mean event count followed the same pattern of increase and decrease across trials as that shown by event duration for groom. In contrast, for inactive, total time, event duration and event count increased uniformly across trials within each

session (Figure 4).

In summary, trial means generally decreased within each session for the behaviors locomote, rear and sniff for all three dependent measures for both the apomorphine and saline groups. In contrast, trial means for gnaw and nod increased across the first four or five trials within each session and decreased or levelled off on the final trial of each session for all three dependent measures. Total time, event duration and event count decreased across the six trials within each session for headdown as did total time and event count for jump. Within the saline group, event duration and event count increased across the first three trials within each session and decreased across the final three trials within each session. All three dependent measures increased across trials within each session for inactive.

Drug X Session Interaction. (Appendix, ANOVA: Tables 1-3, 9-11, 17-19; Mean Values(SEM): Tables 26-29, 31, 33) The significant drug x session interactions (D X S) were primarily due to opposing patterns of response for the apomorphine and saline groups across sessions. For locomote and rear, there were significant drug x session interaction effects on all three dependent measures. The significant interactions for locomote were due to a general increase in locomotion across sessions for the apomorphine group while the saline group showed a general decrease in locomotion across sessions. The same pattern was seen for rear where

FIGURE 4
Mean Event Duration for the Saline Group Across Trials
for the Behaviors GROOM and INACTIVE



the saline group decreased and the apomorphine group increased on all three dependent measures across sessions. For sniff, a significant drug x session interaction was found for event count; the interaction was not significant for either total time or event duration. The significant interaction for sniff for event count revealed an increase across sessions for the apomorphine group whereas the saline group showed a decreased event count across sessions.

Drug X Trial Interaction. (Appendix, ANOVA: Tables 1-3, 9-11, 17-19; Mean Values(SEM): Tables 26-28, 35-37, 40-42, 45-47). Significant drug x trial interactions (D X T) were found for locomote and sniff for all three dependent measures and for event duration and event count for rear. In general, the interactions were due to an overall decrease in the dependent measures across all 24 trials for the saline group whereas the apomorphine group showed an overall increase across the 24 trials. Although the six trial means within each session tended to decrease, the overall drug by trial interaction was best shown by comparing the initial trials within each session.

For locomote, the magnitude of the trial mean on the first trial of each session was greater in the apomorphine than in the saline group for all three dependent measures. However, the trial means on the first trial of each session increased across Sessions 1-3 with a decrease on Session 4 for locomote whereas the initial trial means within each session decreased across sessions for the saline group.

For rear, the initial trial means within each session increased across sessions in the apomorphine group and decreased across sessions in the saline group for all three dependent measures.

For total time, initial trial means within each session for sniff decreased across the first three sessions and increased slightly on the fourth session for the apomorphine group whereas the initial trial means within each session increased across the first three sessions and decreased slightly on the fourth session for the saline group for total time. A similar pattern was found for event duration as for total time except initial trial means within each session decreased across all four sessions for the apomorphine group. In contrast, for event count, initial trial means within each session increased across the first three sessions with a slight decrease on the initial trial mean in Session 4 for the apomorphine group whereas the initial trial means decreased across the first three sessions with a slight increase on Session 4 for the saline group.

Drug X Session X Trial Interaction. (Appendix,

ANOVA: Tables 1-3, 9-11, 17-19; Mean Values(SEM): Tables 26-49) The 3-way interaction (D X S X T) was significant for locomote on all three dependent measures. This effect was due to a general increase in session means accompanied by a decrease across the six trial means within each session for the apomorphine group. The saline group showed a

general decrease in session means with a decrease across the six trials within each session. The same pattern accounted for the significant 3-way interactions found for rear on event count and for sniff on total time and event duration.

In summary, for the common behaviors, the drug x session interactions were due to a potentiating effect across days of chronic apomorphine treatment as opposed to habituation, and therefore a decrease in the common behaviors, across days for the saline group. This pattern was also reflected in the drug x trial interactions where apomorphine treatment resulted in increased behavior and saline treatment resulted in decreased behavior across the 24 trials for locomote and rear for all dependent measures. For sniff, trial means for total time and event duration tended to decrease across trials for the apomorphine group and decrease across trials for the saline group. In contrast, for event count, trial means tended to increase across trials for the apomorphine group and decrease across trials for the saline group.

The drug x session x trial interaction was due to the increase in behavior across sessions accompanied by a decrease in behavior across trials within each session for the apomorphine group. Both session means and trial means decreased in the saline group. All the common behaviors, locomote, rear and sniff, showed significant interaction effects which reflected the potentiating effect

of apomorphine and the habituation of the saline-treated animals.

Session X Trial Interaction. (Appendix, ANOVA: Tables 1-25; Mean Values(SEM): Tables 29-49) Session x trial interactions for locomote, rear and sniff were discussed under the heading Drug X Session X Trial Interaction. Significant session x trial (S X T) effects were found for gnaw and nod on all three dependent measures, however, in contrast to locomote, rear and sniff, the interaction was due to a mean decrease across sessions whereas trial means increased within each session. Headdown showed a significant interaction effect on event duration and both headdown and jump showed significant session x trial interactions on event count. Event count for headdown and jump increased across sessions with a decrease in event count across trials within each session. Event duration for headdown showed a similar pattern.

For the behaviors occurring exclusively among the saline-treated animals, inactive showed a significant session x trial interaction effect for total time. There were no significant interaction effects for the remaining two measures of inactive and no significant effects for any of the dependent measures of groom.

In summary, the administration of apomorphine to normal animals had profound effects on the common behaviors. Acute apomorphine administration resulted in high locomotion and sniffing in the first session relative to

saline. In addition, chronic administration of apomorphine enhanced this difference in subsequent sessions. In contrast, the saline-treated animals showed a marked habituation across sessions with decreased behavior accompanied by increased inactivity. Apomorphine administration also resulted in the loss of groom and inactive from the animals' behavioral repertoires and resulted in the introduction of four new behaviors: gnaw, nod, headdown and jump.

Significant drug x session interaction effects were mainly due to increases in locomote, rear and sniff across sessions among apomorphine-treated animals while saline-treated animals showed a decrease in these behaviors across sessions. Significant session x trial interactions were evident for gnaw and nod where both behaviors decreased across sessions but increased across trials within each session. Significant session, trial and session x trial effects were found for headdown and jump even though they occurred with low frequency. Among saline-treated animals, grooming decreased across sessions while inactivity increased. A significant session x trial interaction was found for inactive (total time) whereas there were no significant interaction effects for any of the dependent measures of groom.

Trial By Trial Intercorrelation

Twnty-four trials were intercorrelated within each group, behavior and dependent measure to determine the

relative stability of behaviors of individuals. In general, it was found that more trials were significantly intercorrelated in the apomorphine than in the saline group (Appendix, Significant Correlation Coefficients: Tables 50-84).

Six trials comprised one session with Session 1 composed of Trials 1 to 6, Session 2 of Trials 7 to 12, Session 3 of Trials 13 to 18 and Session 4 of Trials 19 to 24. In a redundant (square) 24 x 24 correlation matrix a maximum number of 552 significant correlations (overall correlation) were possible if all trials were intercorrelated (excluding the 24 trials correlated with themselves). The maximum number of significant correlation coefficients possible if one session completely intercorrelated with a second session was 36 significant correlations (between session) and 30 significant correlations (within session) were possible if all trials within one session were intercorrelated (excluding diagonal elements). The numbers of intercorrelated trials reported below represent proportions of these totals.

Only significant correlation coefficients will be discussed. A probability level of .05 was taken as the minimum level at which significance was obtained.

For locomote, there were more trial by trial intercorrelations in the apomorphine group (Figures 5-7) than in the saline group (Figures 8-10) with 50% of the trials intercorrelated for total time, 37% overall

FIGURE 5

Trial by Trial Significant Intercorrelations for LOCOMOTE (Total Time)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																									
2																									
3																									
4																									
5																									
6																									
7																									
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20																									
21																									
22																									
23																									
24																									

x: p < .05

o: p < .01

FIGURE 6

Trial by Trial Significant Intercorrelations for LOCOMOTE (Event Duration)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1			o	o	o				x	x				x	x										
2				o	o				o	x															
3					o	o	x		x	o	x			x											
4						o	o			x	x														
5							o			x	o			x				x							
6											o			x									x		
7									o	o	o			o	o	x				x					
8									o		o	o		o	o	o									
9									o	o		x		o	o	o	x	o			x	o	o		
10									o	o	o			x	x	x	x					x	o		
11												o							x						
12													o												
13									o	o	o	x			o	o	o	o			o	o	o	o	o
14									o	o	o	x			o		o	o	o		x	o	o	o	o
15									o	o	o	x			o	o		o	o	o		x	o	x	x
16										x	x				o	o	o		o	o			x	x	
17										o					o	o	o	o	o				x	x	
18											x					o	o	o							
19														o	x						o	o	o	o	
20								x		x				o	o	x					o		o	o	o
21									o	x				o	o	o					o	o		o	x
22							x			o	o			o	o	x	x	x			o	o	o	o	o
23														o	o	x	x	x			o	o	o	o	o
24																						x	o	o	

x: $p < .05$ o: $p < .01$

FIGURE 7

Trial by Trial Significant Intercorrelations for LOCOMOTE (Event Count)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1			o	x																					
2					o	x								o	x	x				x		o			
3					x	o		o		x				o	o	o				x	x	o	o		
4							x	o		o	o			x	o	o	x	x	o			o	o	x	
5																	o		x	o			o	x	
6								x		o	o	o			x	o	x	x	o		x	x	o	o	
7									o	x	x			x	o	o				o	o	x			
8														o	o	o				x	o	o	x		
9														o	o	o				o	o	o	x		
10														o	o	o	o	x		o	o	o			
11																x	x	x	x				o		
12																		x	x						
13																				o	o	o	o		
14																				o	o	o	o	x	
15																				o	o	o	o	o	
16																					x	x	o	o	
17																						o	o		
18																						o	o	x	
19																						o	x		
20																						o	o	o	
21																						x	o	o	o
22																							o	o	o
23																							o	o	o
24																								o	o

x: $p < .05$ o: $p < .01$

FIGURE 8

Trial by Trial Significant Intercorrelations for LOCOMOTE (Total Time)

SALINE																								
TRIAL																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	x																							
2													x								x	x		
3	x																							
4																								
5																								
6																					x			
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x: $p < .05$

o: $p < .01$

FIGURE 9

Trial by Trial Significant Intercorrelations for LOCOMOTE (Event Duration)

SALINE		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1			x																						
2														x	x										
3			x											x											
4																									
5																					x				
6																									
7																			x						
8																			x						
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

FIGURE 10

Trial by Trial Significant Intercorrelations for LOCOMOTE (Event Count)

		SALINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		x																							
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

intercorrelation for event duration and 52% overall intercorrelation for event count compared to 5%, 7% and 7% for total time, event duration and event count, respectively, for the saline group.

Several patterns emerged from the apomorphine group intercorrelations for locomote for all three dependent measures. Early trials were most often correlated with early trials in the same session and in the other three sessions and late trials were most often correlated with late trials within and between sessions.

The trials comprising the third session were most highly intercorrelated (80%). Lesser intercorrelations were found within Sessions 1 (60%), 2 (60%) and 4 (53%). Between sessions, Session 3 and 4 had more significant intercorrelations (77%) than any other combination of sessions. No major patterns emerged among the intercorrelations for the saline group on all three dependent measures for locomote.

For rear, the apomorphine group showed 67% overall intercorrelation for total time, 77% overall intercorrelation for event duration and 92% overall intercorrelation for event count (Figures 11-13). In contrast, the saline group had 4% overall intercorrelation for total time, 4% for event duration and 3% for event count (Figures 14-16). As seen with locomote, no major patterns emerged from the trial by trial intercorrelations of the saline group.

Paralleling locomote, temporally adjacent trials were

FIGURE 11

Trial by Trial Significant Intercorrelations for REAR (Total Time)

APOMORPHINE

		TRIAL																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1		o	o	o	o	o					o															
2			o	o	x	o	o				o															
3		o	o		o	o		x		x	o								x	x						
4		o	o	o		o		x		x	o									x	x					
5		o	x	o	o		o				o										x					
6		o	o	o	o	o				x	o										x					
7			o	x	x				o	x	o			x	x	x	o	x	x	o		o	o	o		
8								o		o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	o	o
9				x	x		x	x	o		o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
10		o	o	o	o	o	o	o	o	o		o		o	o	o	o	o	o	o	o	o	x	o	o	o
11									o	o	o		o	o	o	o	o	o	o	o	o	o	o	o	o	o
12									x	o		o		o	x	o	x			o	o	o	x	o	o	o
13								x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
14								x	o	o	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	o
15								x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
16								o	o	o	o		x	o	o	o	o	o	o	o	o	o	o	o	o	o
17								x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
18				x				x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	x	o	o
19			x	x	x	x		o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
20									o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
21								o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
22									o	o	x	o	x	o	o	o	o	x	o	o	o	o	o	o	o	o
23								o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
24									o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o

x: $p < .05$ o: $p < .01$

FIGURE 12

Trial by Trial Significant Intercorrelations for REAR (Event Duration)

APOMORPHINE																							
TRIAL																							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		o	o	o	o	o	o	x	x	o					x		x		x				
2	o		o	o	o	o	o	x	x	o					x		x		x	x	x		
3	o	o		o	o	o	o	x	x	o					x		x		x	x	x		
4	o	o	o		o	o	o	x	x	o					x		x		x	x	x		
5	o	o	o	o		o			x	o							x						
6	o	o	o	o	o				x	o							x						
7	o	o	o	o			o	o	o	o		o	o	o	o	o	o	o	x	o	o	o	x
8	x	x	x	x			o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
9	x	x	x	x	x	x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
10	o	o	o	o	o	o	o	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	o
11							o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
12							o	o	x	o		o	o	o	o	x	x	o	o	o	o	o	o
13							o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
14							o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
15							o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
16	x	x	x	x			o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
17							o	o	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o
18							o	o	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o
19	x	x	x	x	x	x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
20							x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
21	x	x	x	x			o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
22			x	x			o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
23	x	x	x	x			o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
24							x	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o

x: $p < .05$ o: $p < .01$

FIGURE 13

Trial by Trial Significant Interrelations for REAR (Event Count)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		o	o	o	o	o		o	o	o	o	x	x	x		o	o	o	x	x	o	x			
2			o	o	o	o		o	o	o	o	x	x	x		o	o	o	x	x	x	x			
3				o	o	o		o	o	o	o	x	x	o	x	o	o	x		x	x	x	x		
4					o	o		o	o	o	o	x	x	x		o	o	x		x	x				
5						o		o	o	o	o	o	x	x	x	o	o	o	x	x	o	x			
6								o	o	o	o	x	o			o	o	o	o		o	x			
7									o	o	o	o	o	o	o	x	o	o	o	o	o	o	o	o	o
8										o	o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
9											o	o	o	o	o	o	o	o	o	o	o	o	o	o	o
10												o	o	o	o	o	o	o	o	o	o	o	o	o	x
11													o	o	o	o	o	o	o	o	o	o	o	o	o
12														o	o	o	o	o	o	o	o	o	o	o	o
13															o	o	o	o	o	o	o	o	o	o	o
14																o	o	o	x	o	o	o	o	o	o
15																	o	o	o	x	o	o	o	o	o
16																		o	o	o	o	o	o	o	o
17																			o	o	o	o	o	x	
18																				o	o	o	o	o	o
19																					o	o	o	o	x
20																						o	o	x	x
21																							o	o	o
22																								o	o
23																									x
24																									x

x: $p < .05$ o: $p < .01$

FIGURE 15

Trial by Trial Significant Intercorrelations for REAR (Event Duration)

		SALINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1					x																				
2									x					x											
3																								x	
4		x																							
5																									
6																									
7																				x					
8			x																x						
9																									
10																			x						
11																								x	
12																									
13				x															x						
14																									
15																									
16																									
17																									
18																									
19								x	x		x			x											
20																									
21																									
22																									
23					x																				
24											x														

x: $p < .05$ o: $p < .01$

FIGURE 16

Trial by Trial Significant Interrelations for REAR (Event Count)

SALINE		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1								x																	
2								x	o					x											
3																									
4																									
5													o												
6																x									
7		o	o																						
8			x																	x					
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

more often intercorrelated than more distant trials for rear on all dependent measures. Similarly, trials within a session were highly intercorrelated with Sessions 1, 3 and 4 having 100% significant within session intercorrelation and Session 2 having 80% within session intercorrelation for total time and event duration. For event count, all four sessions showed 100% intercorrelation within each session. For total time, Session 1 showed only 41% between session intercorrelation with Session 2, 3% between session intercorrelation with Session 3 and 13% between session intercorrelation with Session 4. A similar pattern was found for event duration with 67%, 13% and 53% between session intercorrelation for Session 1 with Sessions 2, 3 and 4, respectively. However, for total time, Session 2 showed a 93% between session intercorrelation with Session 3 and for event duration, Session 2 showed a 100% between session intercorrelation with Session 3. All other combinations of between session correlations showed 100% intercorrelation for both measures.

For sniff, the saline group did not show any patterns of intercorrelation with the overall intercorrelations being 9% for total time, 8% for event duration and 11% for event count. Some intercorrelation of proximal trials was found for the saline group (Figures 20-22). For the apomorphine group, overall intercorrelations were 64% for total time, 33% for event duration and 80% for event count (Figures 17-19). Temporally adjacent trials were more

FIGURE 17

Trial by Trial Significant Intercorrelations for SNIFF (Total Time)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

FIGURE 18

Trial by Trial Significant Intercorrelations for SNIFF (Event Duration)

APOMORPHINE

		TRIAL																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1		o	o	o	o	o													x								
2	o		o	o	o	o																					
3	o	o		o	o	o																					
4	o	o	o		o	o																					
5	o	o	o	o		o																					
6	o	o	o	o	o																						
7							o							o	o	o				o	o	x					
8							o	o		x				o	o	o	x	x	x	x	x		x		x		
9							o		o	o	o			x	o	o	o	o	o								
10								o		o	o			x	o	o	o										
11								x	o	o		o				o	o	o	o								
12									o	o	o					o	o	o	o				o				
13										o	o	x				o	o	x			o	o					
14										o	o	o	x			o			x	x	o	o	o	o	x	x	
15										o	o	o	o	o	o	o	o		o	o	o		o	x	o	x	x
16										x	o	o	o	o	o	x		o		o	o						
17										x	o	o	o	o	o	x	o	o		o							
18	x									x	o		o	o		x	o	o	o								
19								o	x						o	o	o				o	o					
20								o	x						x	o	o				o		o	o	x		
21								x								o	x				o	o	o	o	o	o	
22								x								o	o				o	o		o	o	o	
23																x	x				x	o	o		o	o	
24																x	x					o	o	o		o	

x: $p < .05$ o: $p < .01$

FIGURE 19

Trial by . Significant Intercorrelations for SNIFF (Event Count)

APOMORPHINE

TRIAL																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		o					x	x	x				o	o	o	x	x		o	x	o	x	x	x
2	o		o			x	x	o	o				x	o	o				x	o	x			
3		o		o	o	o	x	o	o	x	x		o	o	o	x	x		x	x	o			
4			o		o	o				x	o			x	x	x	x	o	x	x	x	o	o	
5				o	o	o				o	o		x	x	x	o	o	o	x	x		x	o	
6		x	o	o	o		x	o	o	o	o	x	x	o	o	o	o	x		o	o	o	o	
7	x	x	x			x		o	o	x	x		x	x	o	o	o	x	x	o	o	x	x	
8	x	o	o			o	o		o	x	x		x	o	o	o	o		o	o	o	x		
9	x	o	o			o	o	o		o	o		o	o	o	o	o	o	x	o	o	o	x	
10			x	x	o	o	x	x	o		o	x	o	x	x	o	o	o	x	o	o	o	o	x
11			x	o	o	o	x	x	o	o		o	o	x	x	o	o	o	o	o	x	o	o	
12						x				x	o						x		x	x		x		
13	o	x	o		x	x	x	x	o	o	o		o	o	o	o	o	o	o	o	o	o	o	x
14	o	o	o	x	x	o	x	o	o	x	x		o	o	o	o	x	x	o	o	o	o	o	x
15	o	o	o	x	x	o	o	o	o	x	x		o	o	o	o	o	x	o	o	o	o	o	x
16	x		x	x	o	o	o	o	o	o	o		o	o	o	o	o	o	o	o	o	o	o	
17	x		x	x	o	o	o	o	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	x
18				o	o	x	x		o	o	o		o	x	o	o	o		o	o	x	x	o	
19	o			x	x		x		x	x	o		o	x	x	o	o	o	o	o	x	o	o	
20	x	x	x	x	x	o	o	o	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	
21	o	o	x	x		o	o	o	o	o	x	x	o	o	o	o	o	x	o	o	o	o	o	
22	x	x	o	o	x	o	o	o	o	o	o		o	o	o	o	o	x	x	o	o	o	o	
23	x			o	o	o	x	x	o	o	o	x	o	o	o	o	o	o	o	o	o	o	o	
24	x						x		x	x			x	x	x	o	x		o	o	o	o	o	

x: $p < .05$ o: $p < .01$

FIGURE 20

Trial by Trial Significant Intercorrelations for SNIFF (Total Time)

		SALINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																									
2					x				x	o															
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

FIGURE 21

Trial by Trial Significant Intercorrelations for SNIFF (Event Duration)

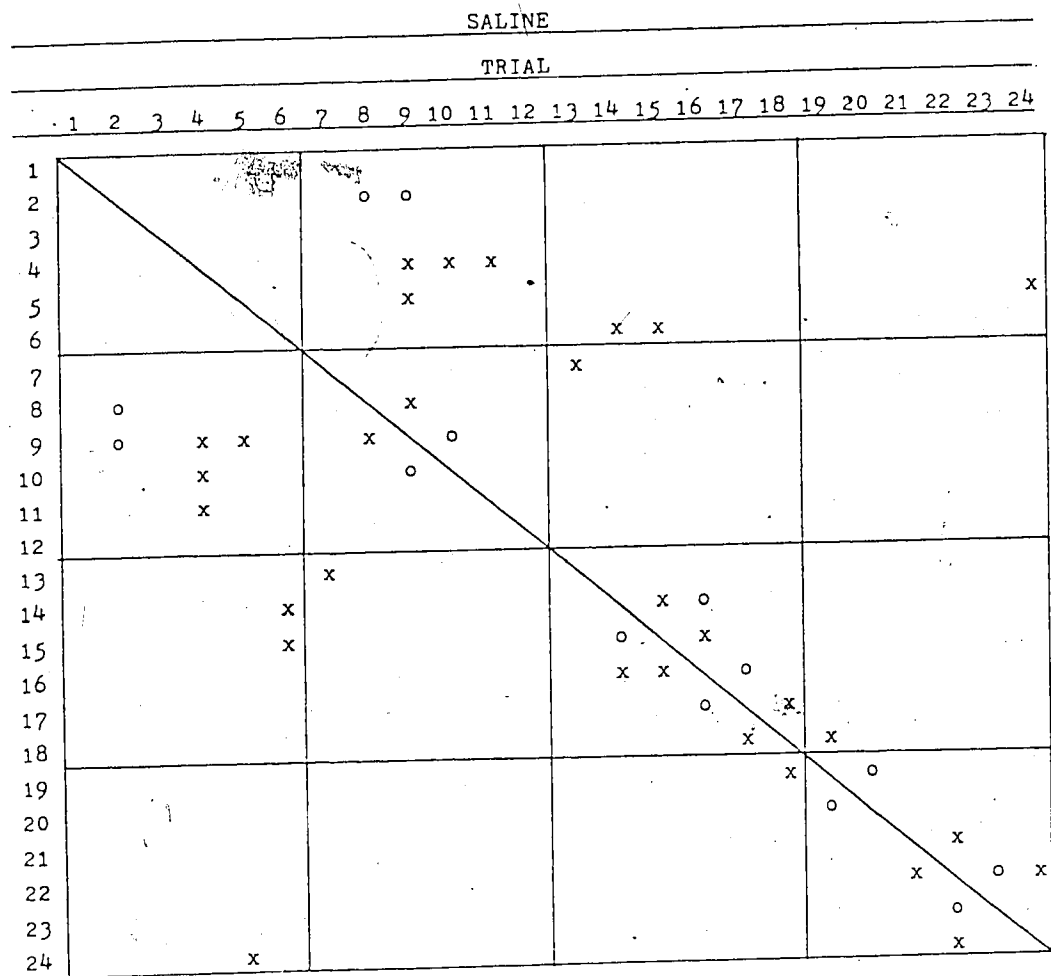
x: $p < .05$ o: $p < .01$

FIGURE 22

Trial by Trial Significant Intercorrelations for SNIFF (Event Count)

		SALINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		x																x							
2		x																							x
3																									
4																									
5																									
6																	x								
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

often intercorrelated than widely separated trials and trials were most often correlated with corresponding trials in other sessions for total time and event count. Trials within sessions were highly intercorrelated with within session intercorrelations of 67%, 100% and 60% for Session 1, 93%, 60% and 80% for Session 2, 80%, 80% and 100% for Session 3 and 93%, 73% and 100% for Session 4 on the dependent measures total time, event duration and event count, respectively. The intercorrelations between sessions were fewest for Sessions 1 and 2 with Sessions 3 and 4 and greatest for Session 3 with Session 4 for total time. A similar pattern was shown for event count although there were a greater overall number of significant correlations for event count than for total time. For event duration, Session 1 showed no intercorrelation with Sessions 2 and 4 and only a 3% intercorrelation with Session 3. Session 2 was most highly intercorrelated with Session 3 (75%) with fewer intercorrelations with Session 4 (19%). Sessions 3 and 4 showed 40% between session intercorrelation for event duration.

In general, the apomorphine group displayed a relatively greater number of intercorrelations for locomote, rear and sniff than did the saline group for all three dependent measures. Whereas the saline group did not show patterns in its intercorrelations, the apomorphine group generally showed adjacent trials to be more often intercorrelated than distant trials and that early and

late trials within a session tended to be correlated with corresponding trials in other sessions. It was further shown that all significant intercorrelations for the apomorphine group were positive and that trials within Session 1 showed high intercorrelations but Session 1 generally showed fewer correlations with other sessions than did Sessions 2, 3 and 4. That most of the correlations were positive indicated that apomorphine affected all intercorrelated trials in the same direction. This unidirectional change in behavior supports the potentiating effect of apomorphine on the common behaviors locomote, rear and sniff as described in the ANOVA. In addition, the fact that trials were intercorrelated within Session 1 but not between Session 1 and the other sessions indicated an acute apomorphine effect that differed from the chronic apomorphine effect shown by the high intercorrelations within and between Sessions 2, 3 and 4.

Of the behaviors occurring in the apomorphine group only, gnaw showed most strikingly that late trials within a session tended to correlate with corresponding trials in other sessions (Figures 23-25). In contrast to locomote, rear and sniff, however, early trials for gnaw were rarely intercorrelated within or between sessions for all three dependent measures. This pattern may reflect the relatively low frequency and duration of gnaw on early trials rather than indicating individual variability. Rather than showing a clear separation between acute and

FIGURE 23

Trial by Trial Significant Intercorrelations for GNAW (Total Time)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

FIGURE 24

Trial by Trial Significant Interrelations for GNAW (Event Duration)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																					x	x	o		
2			o	o		o																			
3			o		o	o	o		x	o	o	o	o				o	o	o			x	x	o	
4			o	o		o	o		x	o	o	o	o				o	o	o			o	x	o	x
5				o	o		o		x	o	o	o	o				o	o	o	o		o	x	o	x
6			o	o	o	o			x	o	o	o	o				x	o	o	o		o	x	o	o
7																									
8				x	x	x	x			o	o	x	o				o	o	o		x				
9				o	o	o	o		o		o	o	o				x	o	o	o		o	o	o	o
10				o	o	o	o		o	o		o	o				o	o	o	o		o	x	o	o
11				o	o	o	o		x	o	o		o				o	o	o	o		o	x	o	o
12				o	o	o	o		o	o	o	o					x	o	o	o	o		o	o	o
13																					o	o			
14														x		o	x	x	x			o			o
15					o	x			x	o	o	o			o	o	o	o			o		x	o	
16				o	o	o	o		o	o	o	o	o		x	o		o	o			o	x	o	o
17				o	o	o	o		o	o	o	o	o		x	o	o	o				o	x	o	o
18				o	o	o	o		o	o	o	o	o		x	o	o	o				o	o	o	o
19								x						o							o				
20	x													o							o		x	o	
21	x		x	o	o	o			o	o	o	o			o	o	o	o	o		o	x	o	o	o
22	o		x	x	x	x			o	x	x	o				x	x	o			o	o		o	
23			o		o	o			o	o	o	o				x	o	o	o			o	o		o
24					x	o			o	o	o	o				o	o	o	o			o	o		

x: $p < .05$ o: $p < .01$

FIGURE 25

Trial by Trial Significant Interrelations for GNAW (Event Count)

		APOMORPHINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1		x																							
2	x																								
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
11																									
12																									
13																									
14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

chronic apomorphine treatment as shown with locomote, rear and sniff, intercorrelations between sessions for gnaw were fairly uniform for all combinations of sessions for the three dependent measures. The overall numbers of significant correlations for gnaw were greater than those for nod with gnaw showing overall intercorrelations of 52% for total time and event duration and 55% for event count relative to nod with 10% for total time, 21% for event duration and 17% for event count (Figures 26-28). No clear patterns were noted among the intercorrelations for nod, however, this may be due to the variable frequencies and durations of nod on particular trials.

Similarly, the intercorrelations for the two most infrequent behaviors, headdown and jump, were more an indication of the occurrences of the behaviors than of patterns of behavior across trials. Headdown showed overall intercorrelations of .4%, 14% and 4% for total time, event duration and event count, respectively (Figures 29-31). The only pattern of correlations for headdown was the high number of intercorrelations within Session 4 for event duration. This pattern was previewed by intercorrelations within Session 3 where the later trials were intercorrelated. The high number of intercorrelations within Sessions 3 and 4 likely indicate the relatively greater frequency and duration of occurrence of headdown in the final sessions.

As with headdown, jump showed a greater number of

FIGURE 26

Trial by Trial Significant Interrelationships for NOD (Total Time)

APOMC LINE		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1			x	o	o																				
2						x									x										
3		x			o	o	o																		
4		o		o		o	o																		
5		o	x	o	o		o												x						
6				o	o	o													x						
7								o	o	o	o	o													
8								o		x									x		o				
9								o	x		o	o													
10								o		o		o													
11								o		o	o														
12																									
13																									
14																o									
15		x													o			o			o				
16																									
17																									
18				x	x			x							o						o				
19																									
20																									
21								o								o			o						
22																								o	
23																									o
24																									

x: $p < .05$ o: $p < .01$

FIGURE 27

Trial by Trial Significant Intercorrelations for NOD (Event Duration)

APOMORPHINE

TRIAL

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1	x	o	x	o																				
2	x	x												x	x									
3	o	x		o	o	x										x								
4	x		o	o	o					o	x					o								
5	x		o	o	o					o	x					x								
6			x	o	o										x	x	x	x						
7							o								x		x	o		o				
8							o										x			x				
9																							x	
10				o	o					o													o	
11				x	x												x						x	
12																								
13																								
14		x													x	x		x						
15		x					x	x							x			o		o				
16			x	x	x	x									x			o		o	x			
17						x	x	x		x								o			x	o	x	
18						x	o								x	o	o	o			o	x		
19																				o	x			
20																			o	x	x			
21							o	x							o	x	o	x	x		o	x		
22																x	o	x		x	o	o	x	
23								x									x			x	o		x	
24																						x	x	

x: $p < .05$ o: $p < .01$

FIGURE 28

Trial by Trial Significant Interrelations for NOD (Event Count)

APOMORPHINE																								
TRIAL																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1			x																					
2														x										
3	x																							
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								

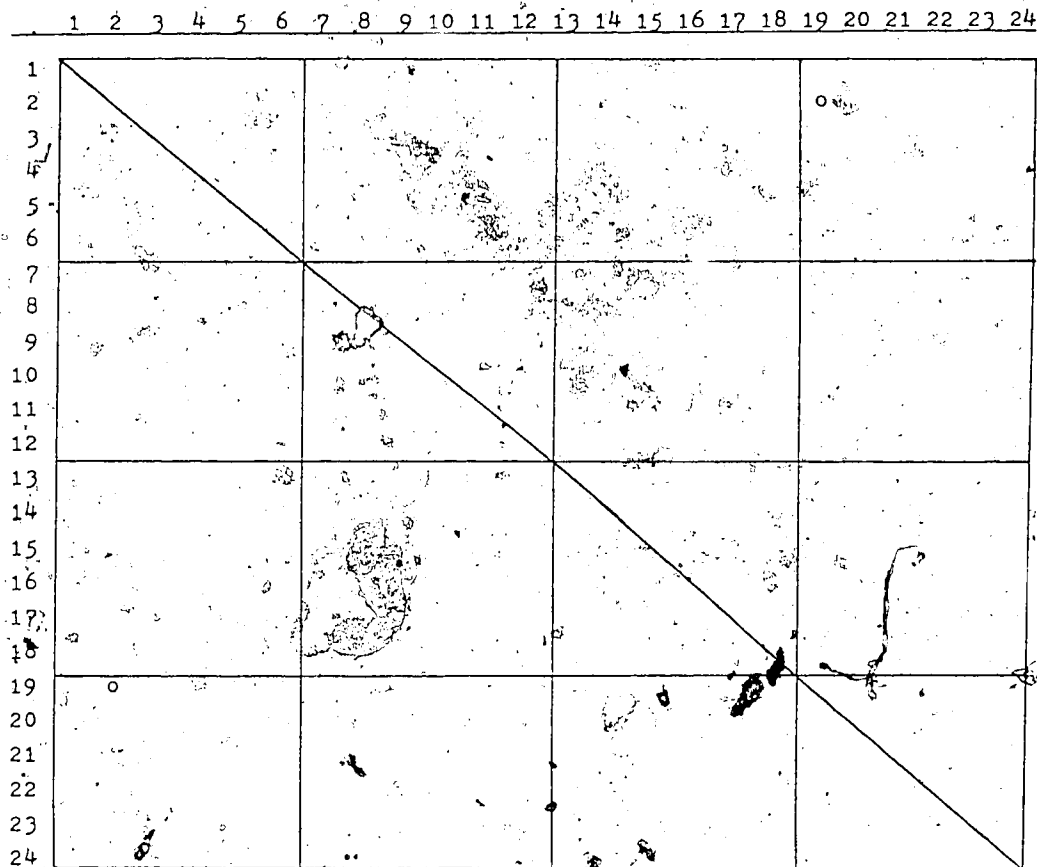
x: $p < .05$ o: $p < .01$

FIGURE 29

Trial by Trial Significant Interrelations for HEADDOWN (Total Time)

APOMORPHINE

TRIAL



x: $p < .05$

o: $p < .01$

FIGURE 30

Trial by Trial Significant Interrelations for HEADDOWN (Event Duration)

APOMORPHINE

		TRIAL																								
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1															x	o				o	x	x	o	o	o	
2													o													
3																										
4																										
5																										
6		o														o										
7																										
8																										
9																										
10																										
11																										
12																										
13		x																								
14		x																								
15																										
16																										
17																										
18																										
19		o																								
20		x																								
21		x																								
22		o																								
23		o																								
24		o																								

x: $p < .05$

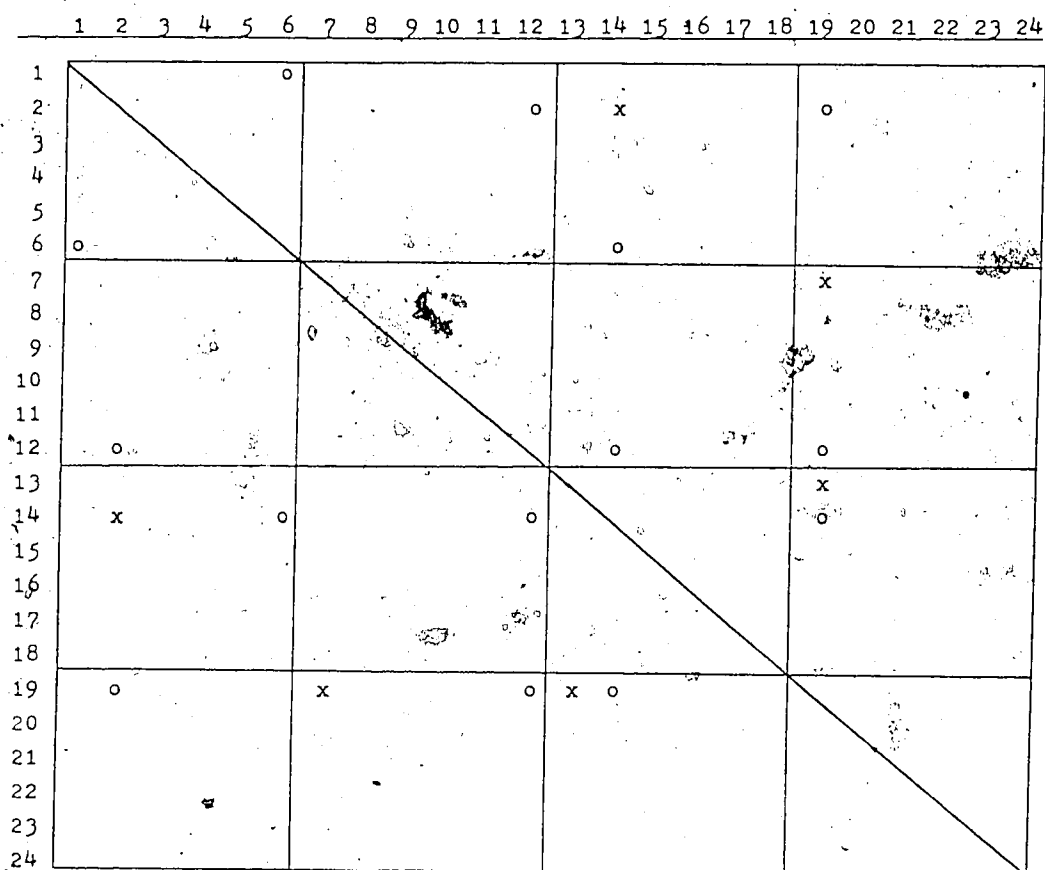
o: $p < .01$

FIGURE 31

Trial by Trial Significant Interrelations for HEADDOWN (Event Count)

APOMORPHINE

TRIAL

x: $p < .05$ o: $p < .01$

intercorrelations between and within Sessions 3 and 4 when compared to Sessions 1 and 2 which also indicated the greater frequency of occurrence of jump in the later sessions (Figures 32, 33). Jump did show a greater overall number of trial by trial correlations than did headdown with 34% for total time and 45% for event count.

Both groom and inactive showed few significant intercorrelations with no major patterns evident among the correlations (Figures 34-39). Inactive showed a greater overall number of intercorrelations than did groom for all dependent measures with 18%, 19% and 15% for inactive and 8%, 4% and 7% for groom on total time, event duration and event count, respectively.

In summary, the apomorphine group showed greater numbers of intercorrelated trials than did the saline group across all behaviors for the three dependent measures. The significant intercorrelations among trials in the saline group appeared scattered in contrast to the apomorphine group where distinct patterns were formed. The apomorphine group tended to show two overall patterns. For the common behaviors locomote, rear and sniff, a pattern of intercorrelation within Session 1 and between and within Sessions 2, 3 and 4 indicated that apomorphine had differential effects on the common behaviors when administered acutely as opposed to chronically. In contrast, within and between session correlations tended to be uniform across all sessions for the drug-induced

FIGURE 32

Trial by Trial Significant Intercorrelations for JUMP (Total Time)

APOMORPHINE

	TRIAL																							
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
12																								
13																								
14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								

x: $p < .05$ o: $p < .01$

FIGURE 33

Trial by Trial Significant Interrelations for JUMP (Event Count)

APOMORPHINE

TRIAL

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																								
2																								
3																								
4																								
5																								
6																								
7																								
8																								
9																								
10																								
11																								
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14																								
15																								
16																								
17																								
18																								
19																								
20																								
21																								
22																								
23																								
24																								

x: $p < .05$

o: $p < .01$

FIGURE 34

Trial by Trial Significant Intercorrelations for GROOM (Total Time)

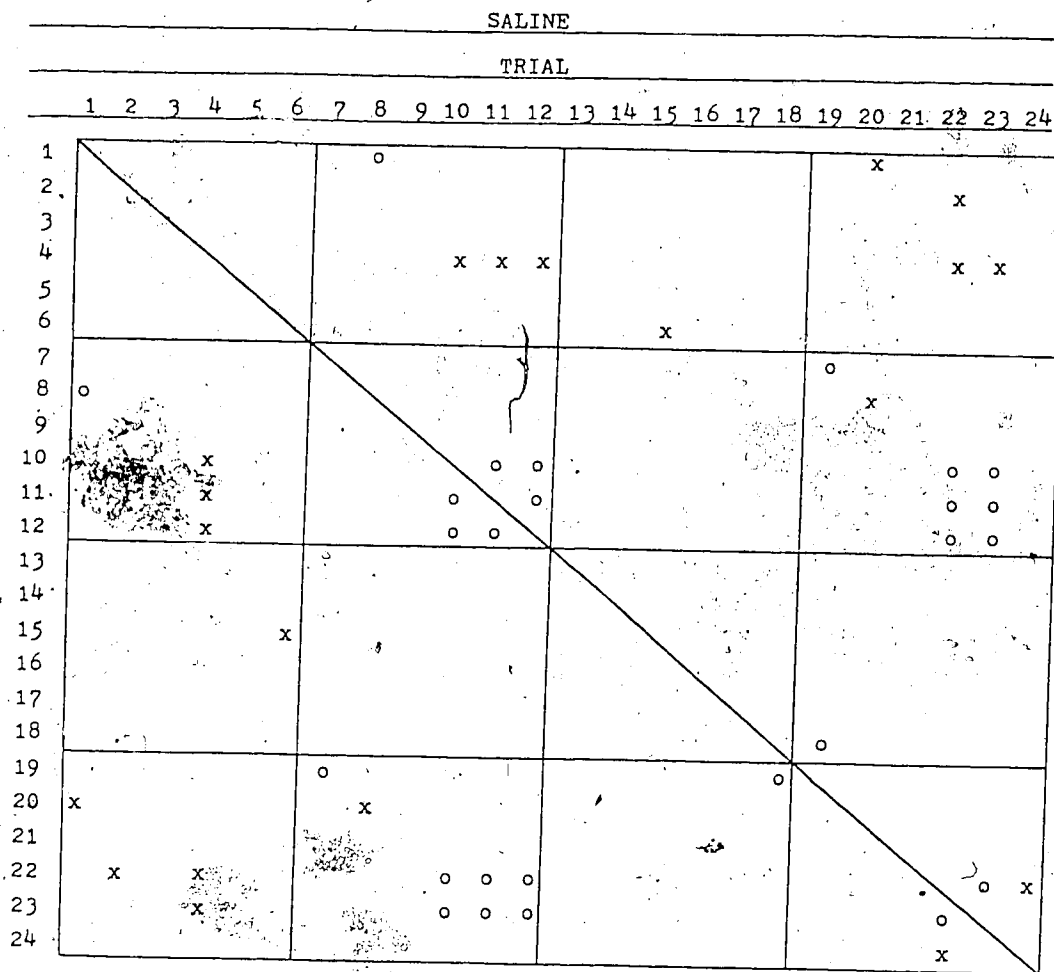
x: $p < .05$ o: $p < .01$

FIGURE 35

Trial by Trial Significant Intercorrelations for GROOM (Event Duration)

SALINE

		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																									
2																									
3																									
4																									
5																									
6																									
7																									
8																									
9																									
10																									
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14																									
15																									
16																									
17																									
18																									
19																									
20																									
21																									
22																									
23																									
24																									

x: $p < .05$ o: $p < .01$

FIGURE 36

Trial by Trial Significant Interrelations for GROOM (Event Count)

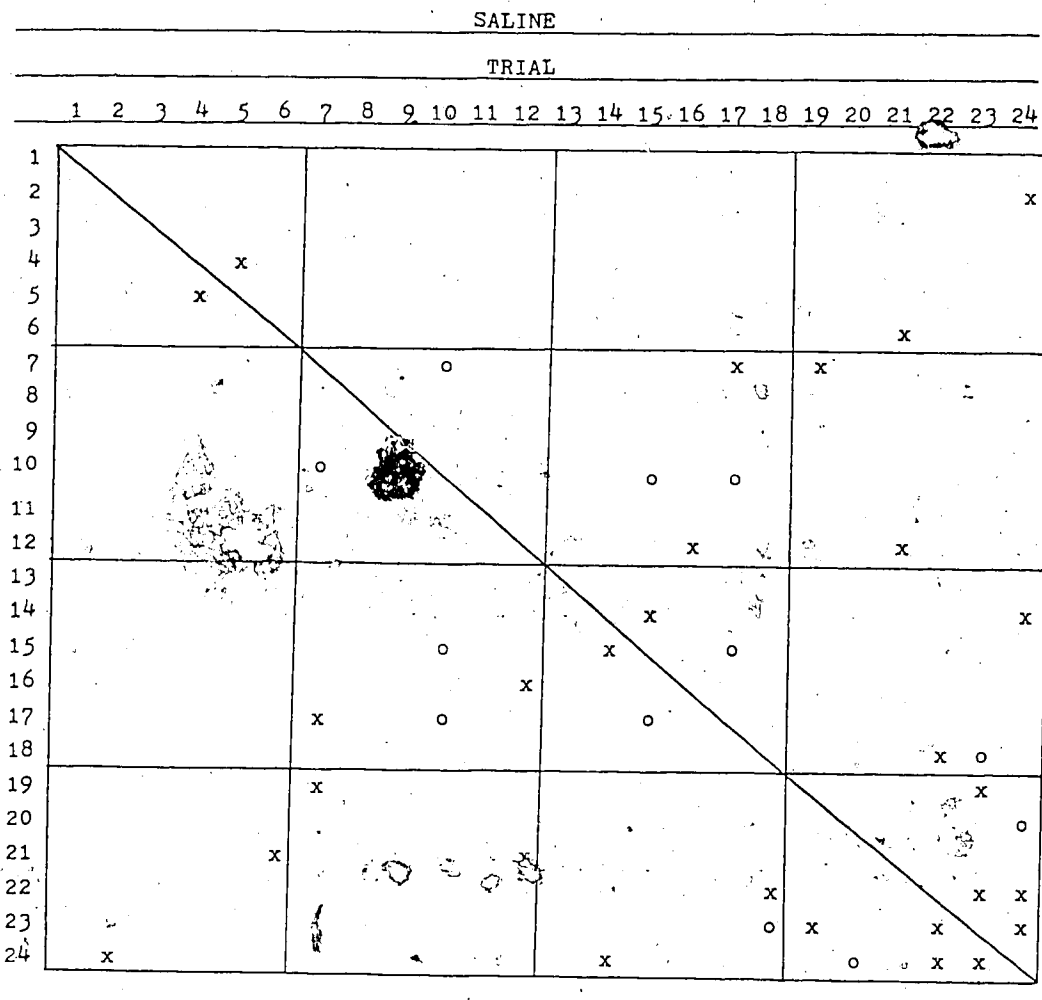
x: $p < .05$ o: $p < .01$

FIGURE 37

Trial by Trial Significant Intercorrelations for INACTIVE (Total Time)

SALINE																									
TRIAL																									
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	
1																									
2				x	o		o	o	o											o	x				
3																									
4		x					x	x		o							x								
5		o					o	o	o											o	x				
6														x	x										
7		o	x		o			o	o											o	x				
8		o	x		o		o		o											o	x				
9		o			o		o	o												o	x				
10			o														x	o					x	x	
11										o								o	o				x	x	
12																									
13																									
14							x								o	x									
15							x								o		x								
16										x	o				x	x		x					x	x	
17				x						o	o						x		o						
18																			o						
19		o			o		o	o	o											x					
20		x			x		x	x	x											x					x
21																							x		x
22										x	x						x					x		o	x
23										x	x						x						o		x
24																						x		x	x

x: $p < .05$ o: $p < .01$

FIGURE 38

Trial by Trial Significant Intercorrelations for INACTIVE (Event Duration)

		SALINE																							
		TRIAL																							
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
1																									
2				o			o		o	o	o										o	x			
3			o				o		o	p	o										o	x			
4												o	x												
5			o	o				o	o	o											x				
6															x										
7			o	o		o			o	o											o	x			
8			o	o		o		o													o	x			
9			o	o		o		o													o				
10					o						o					o	x						o	o	x
11					x						o					o	x						o	o	x
12																									
13																									
14																o					o	x			
15							x								o										
16											o	o					x					x	o	o	x
17										x	x						x		o						
18																		o							
19			o	o		x		o	o	o															
20			x	x				x	x						o		x								
21															x		o						x	x	x
22											o	o					o					x		o	x
23											o	o					x					x	o		x
24											x	x										x	x	x	

x: $p < .05$ o: $p < .01$

FIGURE 39

Trial by Trial Significant Intercorrelations for INACTIVE (Event Count)

SALINE		TRIAL																									
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24		
1																											
2					x	x																					
3					x	x																					
4																											
5																											
6																											
7																											
8																											
9																											
10																											
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15																											
16																											
17																											
18																											
19																											
20																											
21																											
22																											
23																											
24																											

x: $p < .05$ o: $p < .01$

behaviors gnaw and nod. Therefore, the pattern of intercorrelation did not show any distinct acute or chronic effects for these behaviors, simply that apomorphine induced gnaw and nod. Jump and headdown tended to have more numerous within and between session correlations in Sessions 3 and 4 which indicated the relatively greater duration and frequency of these behaviors in the later sessions.

In general, patterns and numbers of overall intercorrelations for a particular behavior were similar for all three dependent measures of that behavior with the following exceptions. For rear, event count showed a greater number of overall intercorrelations than total time and event duration. This was due to the relatively greater number of between session intercorrelations shown for Session 1 with Sessions 2, 3 and 4 for event count than for total time and event duration. In addition, for sniff, a greater number of overall intercorrelations were found for total time and event count than event duration. Again, this was due to the greater number of between session intercorrelations of Session 1 with Sessions 2, 3 and 4. For headdown, a greater number of overall intercorrelations were found for event duration than total time or event count. This was mainly due to the relatively greater number of within session intercorrelations found for Session 4 for event duration.

Individual Differences

Two groups comprising high and low locomotion were created post hoc by summing mean event duration across sessions within the apomorphine treatment group (Costall, Domeney & Naylor, 1982). The 8 animals with the highest composite scores were assigned to the high locomote group and the 8 animals with the lowest composite scores to the low group. This resulted in two levels of locomote, each group containing 40% of the apomorphine population (N=20). Event duration was used as the criterion measure due to its stability relative to total time and event count for locomote. Event count can increase dramatically without affecting event duration, therefore, event duration was used as a conservative measure of overall locomotion for each animal. In addition, since the measure total time is a composite of the measures event count and event duration, it would be subject to some of the variability inherent in the event count measure and was therefore unsuited to the purpose of group division.

Event duration was also chosen as the criterion measure since it was most representative of the behavior gnaw. The duration of the events of the behavior gnaw can increase with concomitant decreases in event frequency. Event duration was chosen as the criterion measure so that the increase in the duration would be adequately reflected and so that the potential decreases in frequency would not erroneously suggest a decrease in the occurrence of the

behavior gnaw across trials.

High and low locomote groups were compared by ANOVA on all behaviors for the measures event duration and event count with subsequent t-tests calculated for group differences on each trial in order to elucidate the relative behavior of the high and low locomote groups across trials. A probability level of .05 was set as the minimum level at which significance was reached for all effects in the ANOVAs and t-tests.

The ANOVAs for all behaviors for the measure event duration are presented in Tables 85-90 (Appendix) and the ANOVAs for all behaviors for the measure event count are presented in Tables 91-97 (Appendix). t-Tests for event duration are shown in Tables 98-103 (Appendix) and for event count in Tables 104-107 (Appendix). Group means(SEM) are presented in Tables 108 and 109 (Appendix) and trial means(SEM) in Tables 110-122 (Appendix).

Group Main Effect. (Appendix, ANOVA: Tables 85-97; Mean Values(SEM): Tables 108, 109) ANOVA revealed that the high and low locomote groups differed significantly on locomote, sniff and gnaw for event duration and event count. The high locomote group showed significantly greater frequency and duration of locomotion and sniffing than did the low locomote group whereas the low locomote group showed significantly greater frequency and duration of gnaw than did the high locomote group. High and low locomote groups also differed significantly on the mean

event duration of headdown with greater mean event duration for the high locomote group. The two groups did not differ significantly on mean event count for headdown.

No significant group effects were found for rear or nod on both dependent measures and for jump on event count.

Trial Main Effect. (Appendix, ANOVA: Tables 85-97; Mean Values(SEM): Tables 110-122) Significant trial main effects were found for locomote, sniff, gnaw, nod and headdown for both dependent measures. The two groups showed a trial main effect for jump on event count.

Means on all 24 trials were greater in the high locomote than the low locomote group for the behaviors locomote and sniff on both dependent measures (Figures 40-47). In contrast, mean event duration and mean event count were generally greater across trials for rear in the low locomote group with the exception of Trials 1 to 6 where both event count and event duration tended to be lower for the low locomote group. Similarly, trial means for gnaw (Figures 40-47) and nod tended to be greater for the low locomote than the high locomote group on both dependent measures.

The significant trial effect for headdown was due to the greater frequency and duration of headdown for the high locomote as compared to the low locomote group. Occurrences of headdown were generally restricted to the early trials within each session with no headdown occurring during the later trials within a session. In contrast,

FIGURE 40
 HIGH versus LOW Locomote Groups for SNIFF,
 LOCOMOTE and GNAW (Event Duration) Trials 1-6

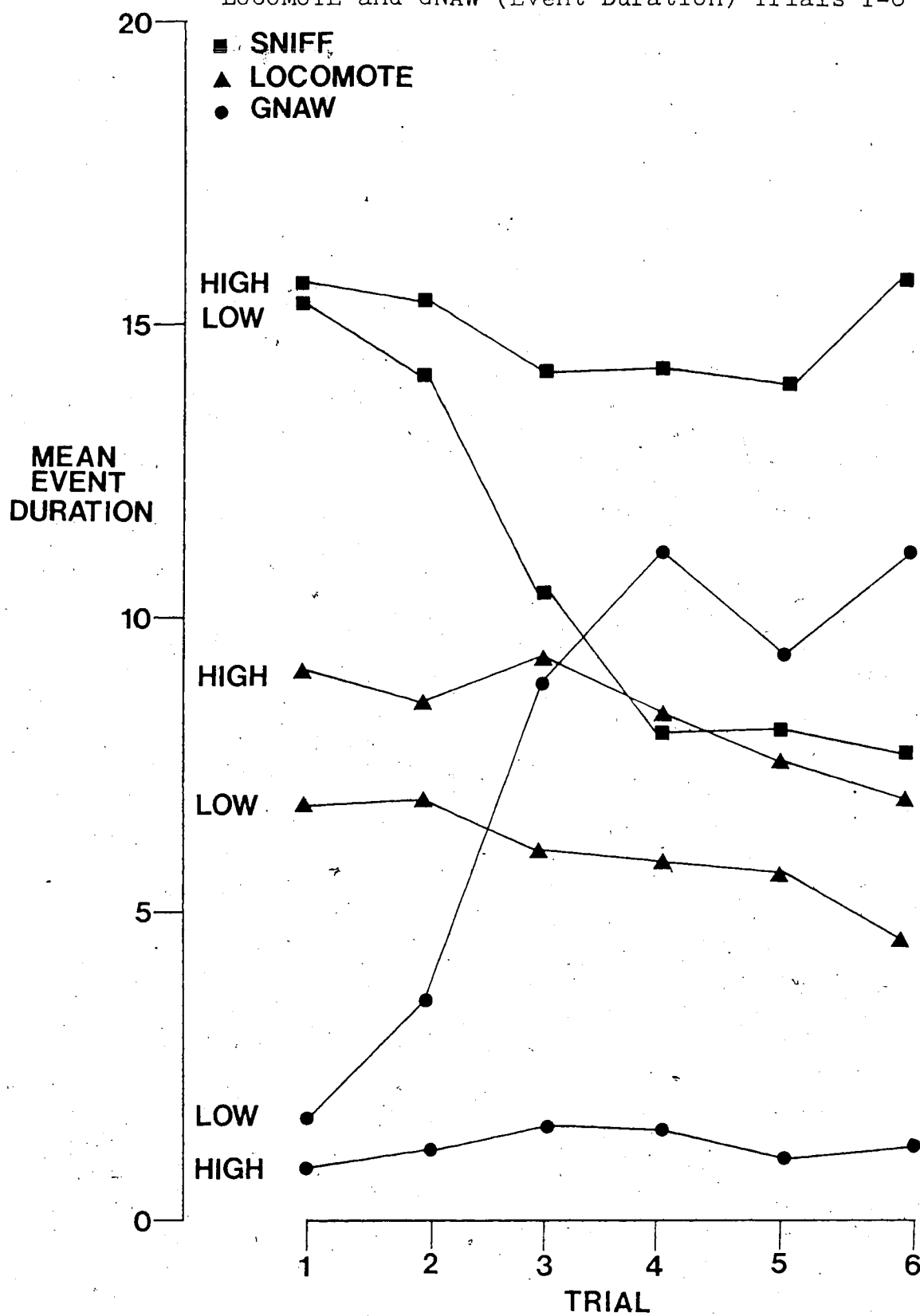


FIGURE 41
HIGH versus LOW Locomote Groups for SNIFF,
LOCOMOTE and GNAW (Event Duration) Trials 7-12

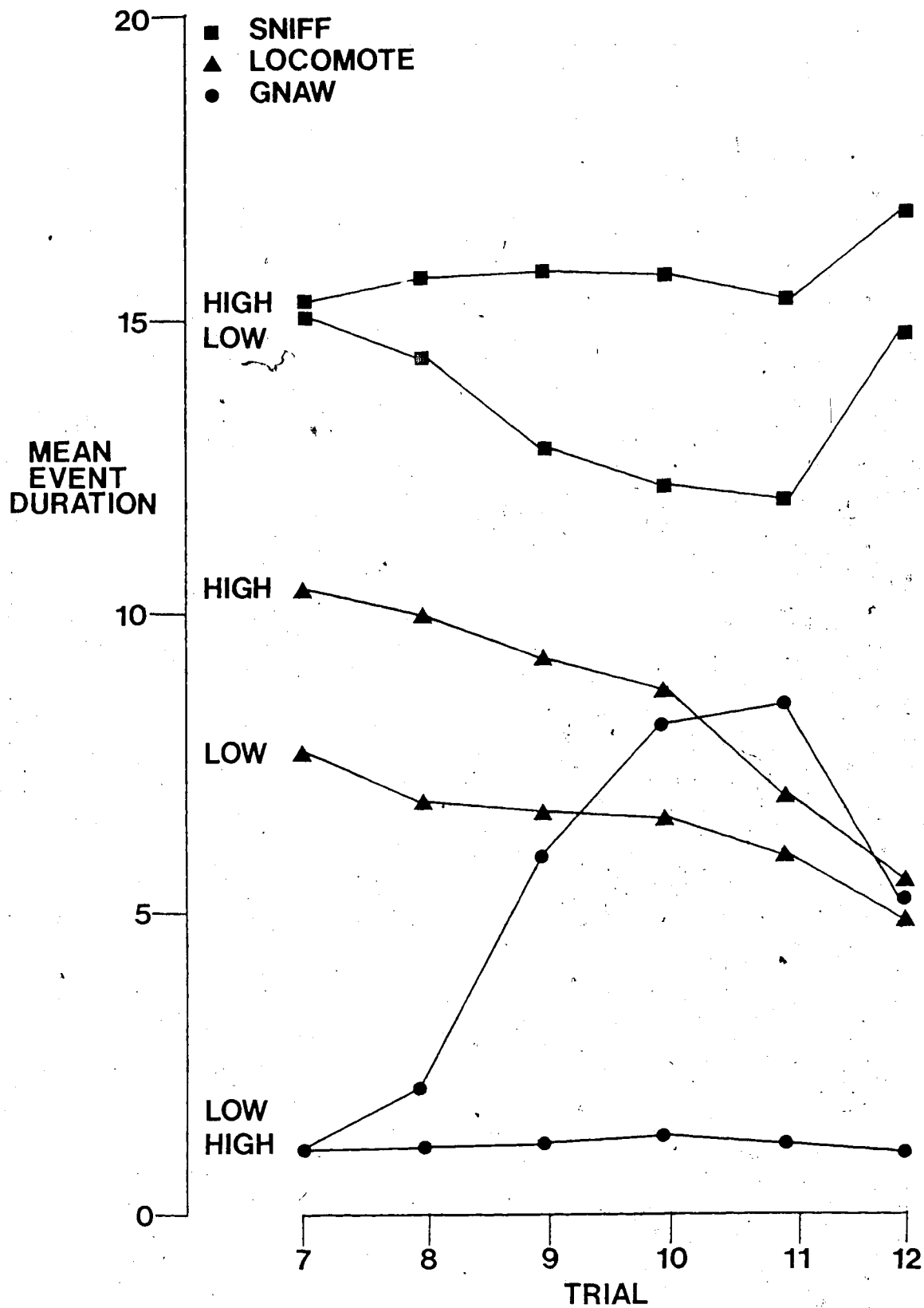


FIGURE 42

HIGH versus LOW Locomote Groups for SNIFF,
LOCOMOTE and GNAW (Event Duration) Trials 13-18

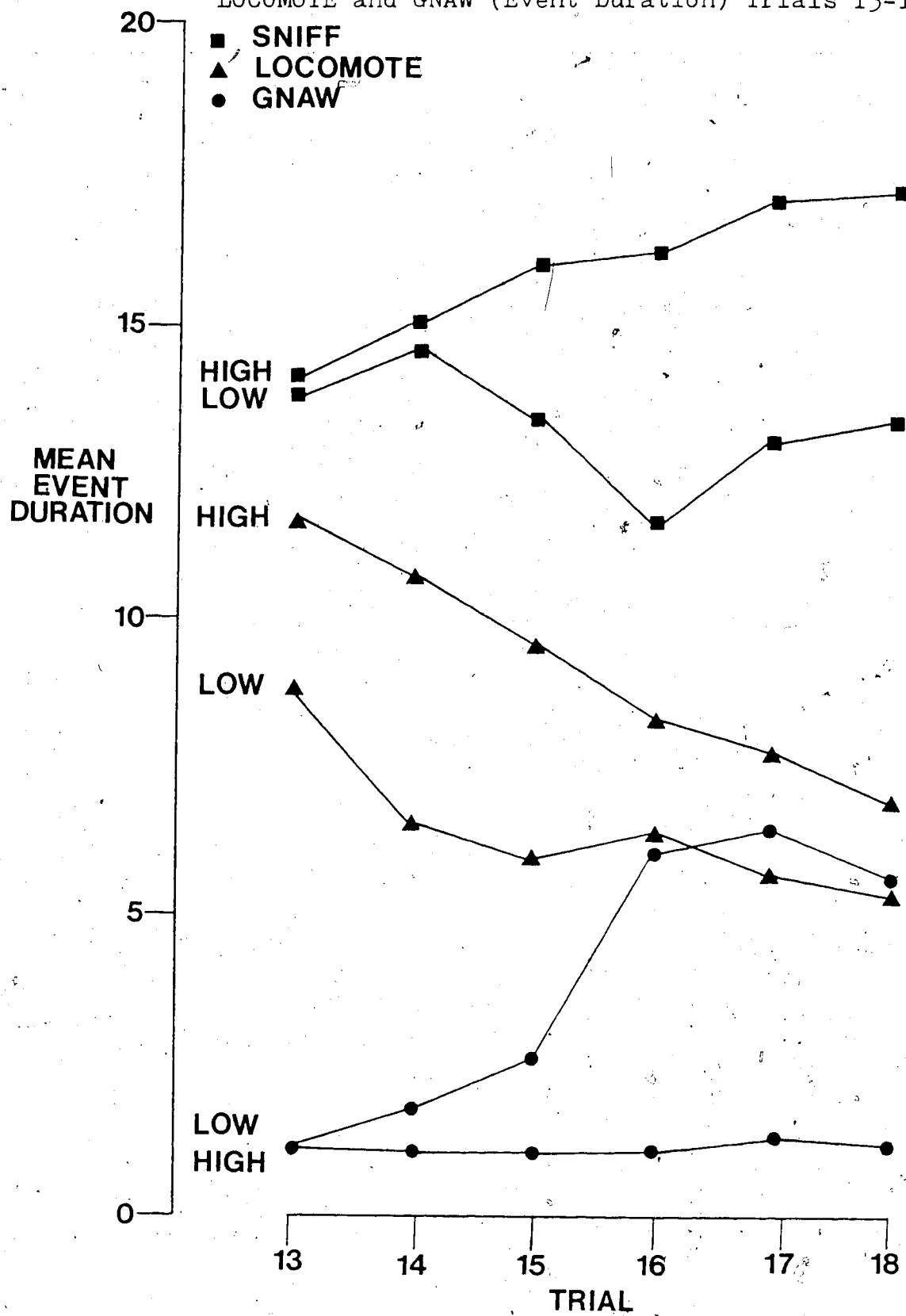


FIGURE 43
HIGH versus LOW Locomote Groups for SNIFF,
LOCOMOTE and GNAW (Event Duration) Trials 19-24

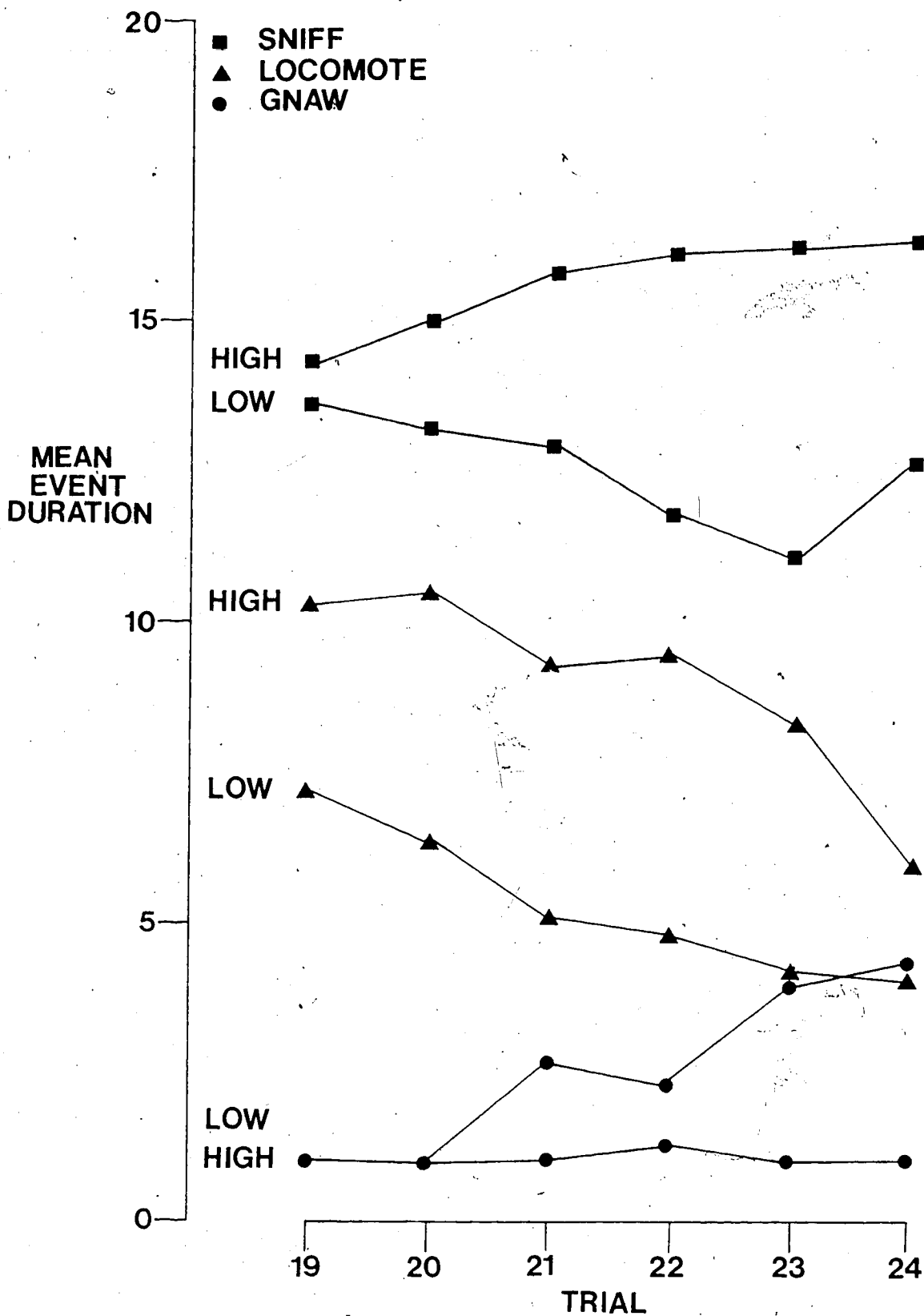
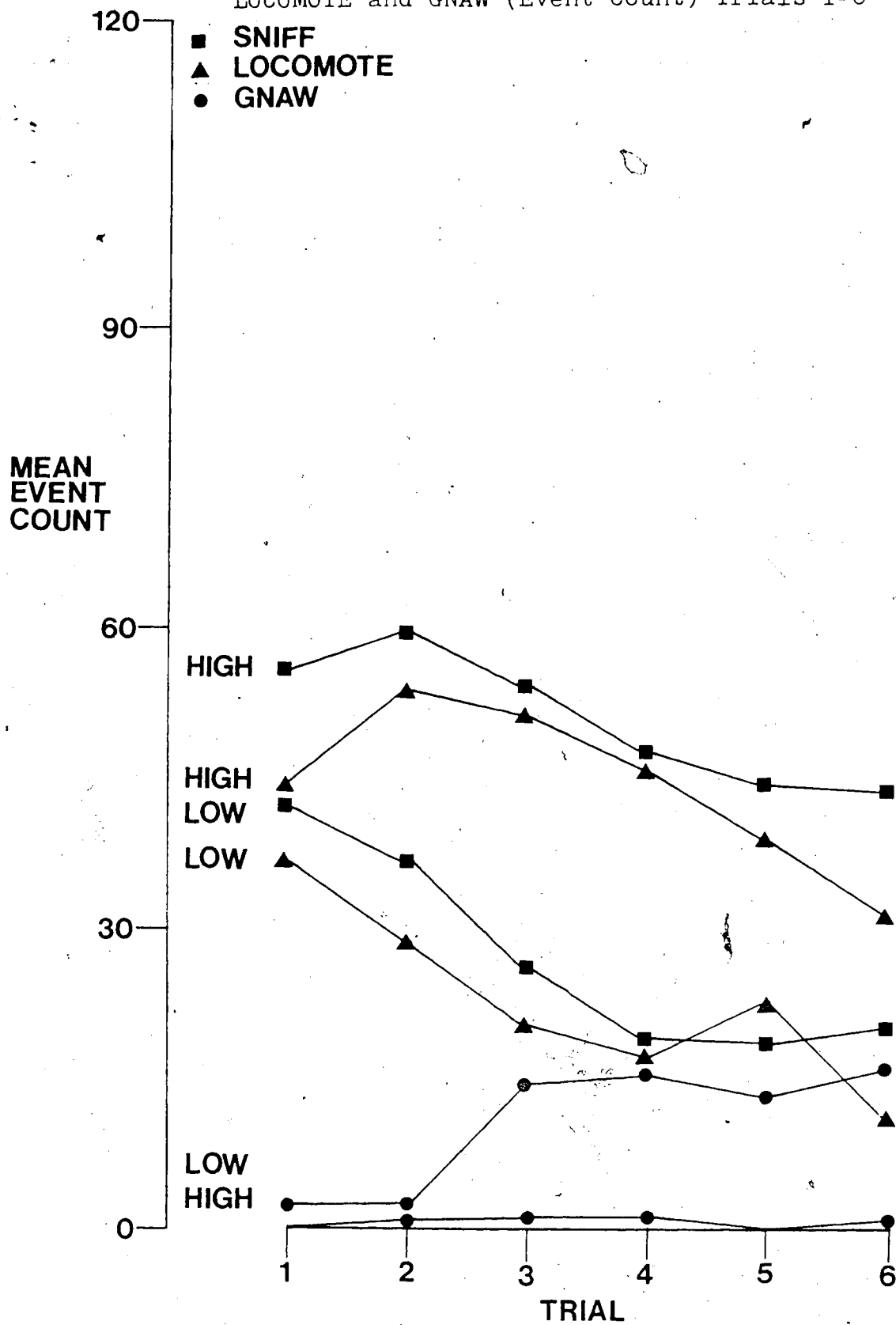
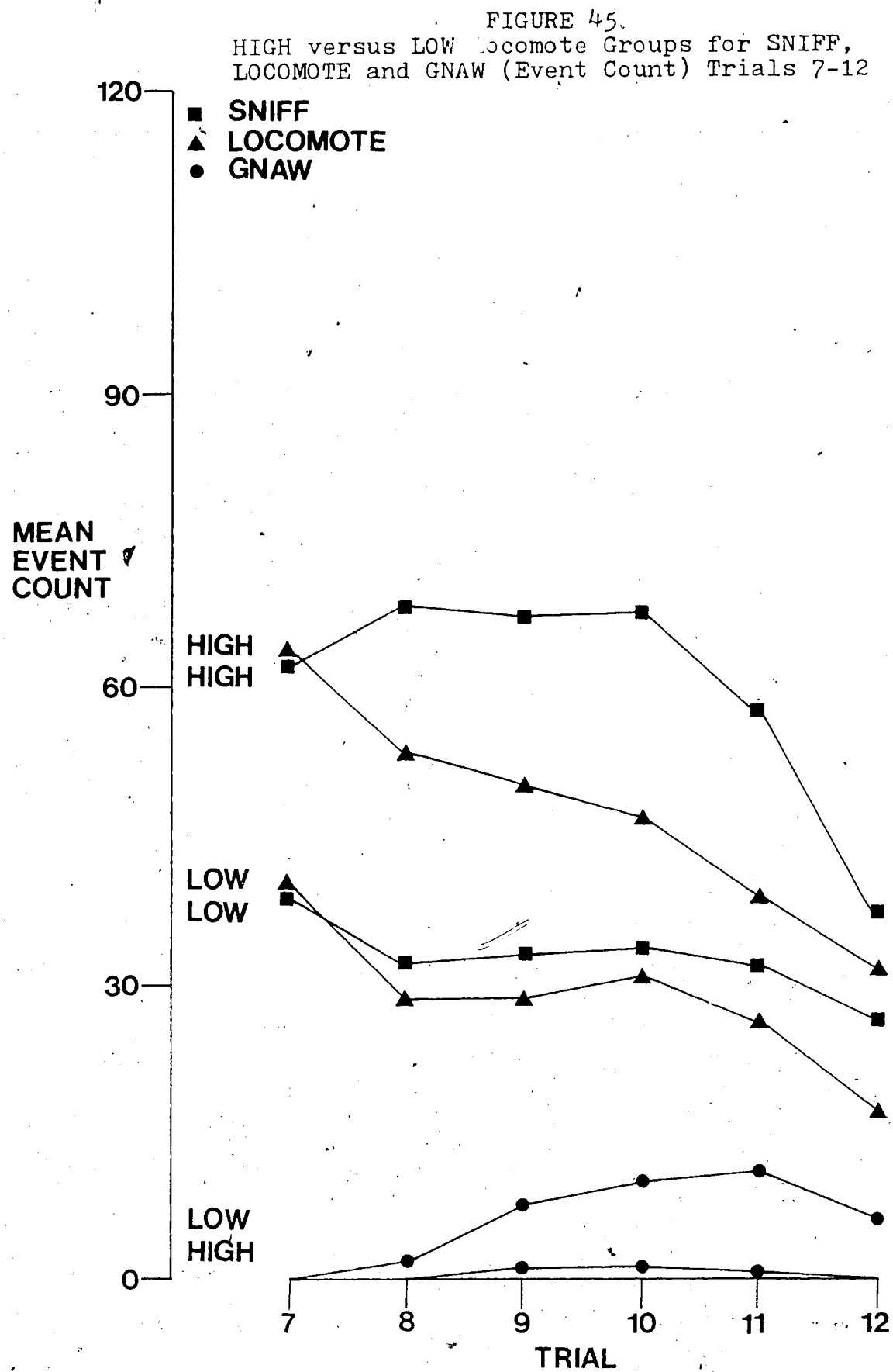


FIGURE 44

HIGH versus LOW Locomote Groups for SNIFF, LOCOMOTE and GNAW (Event Count) Trials 1-6





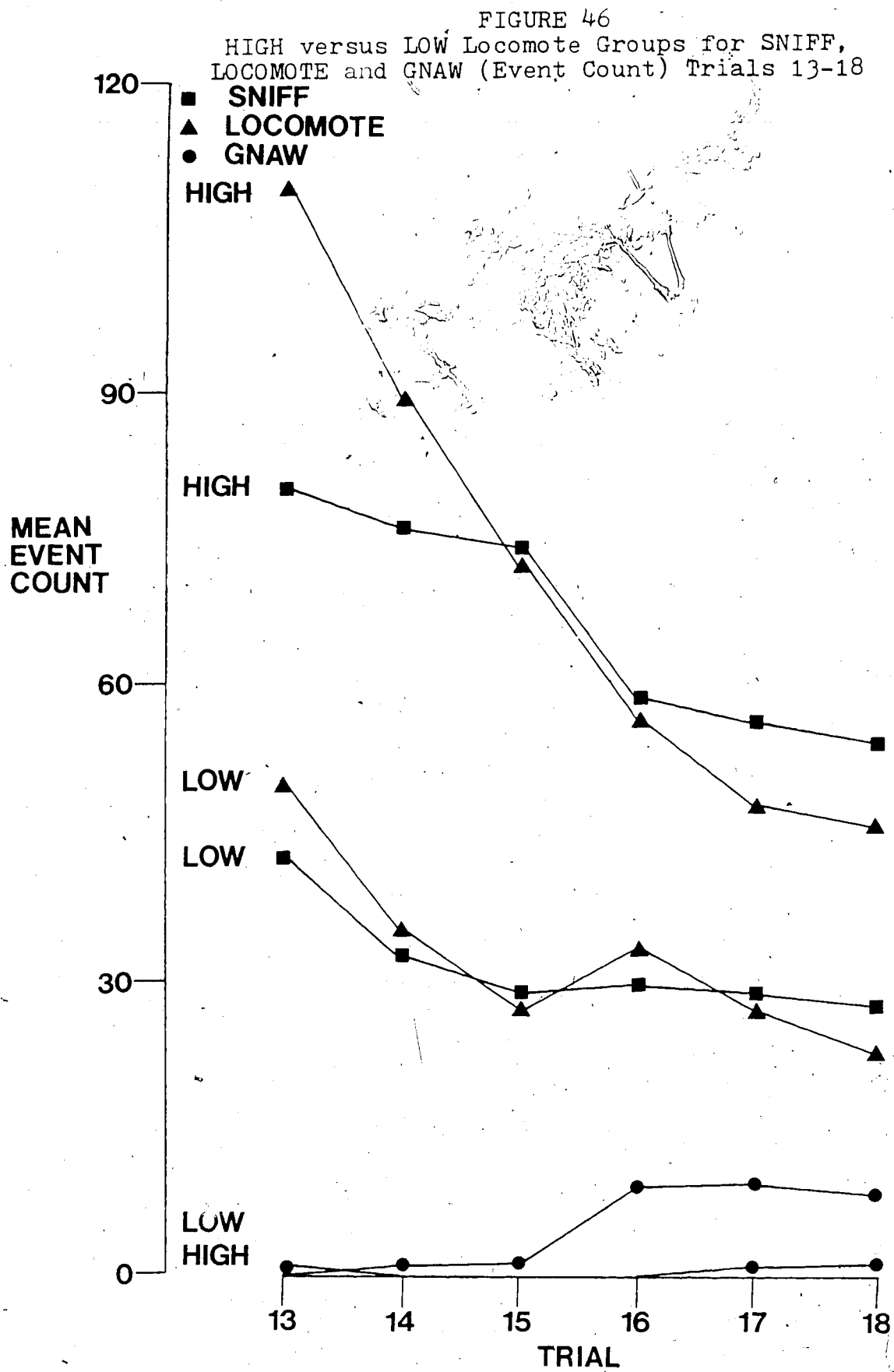
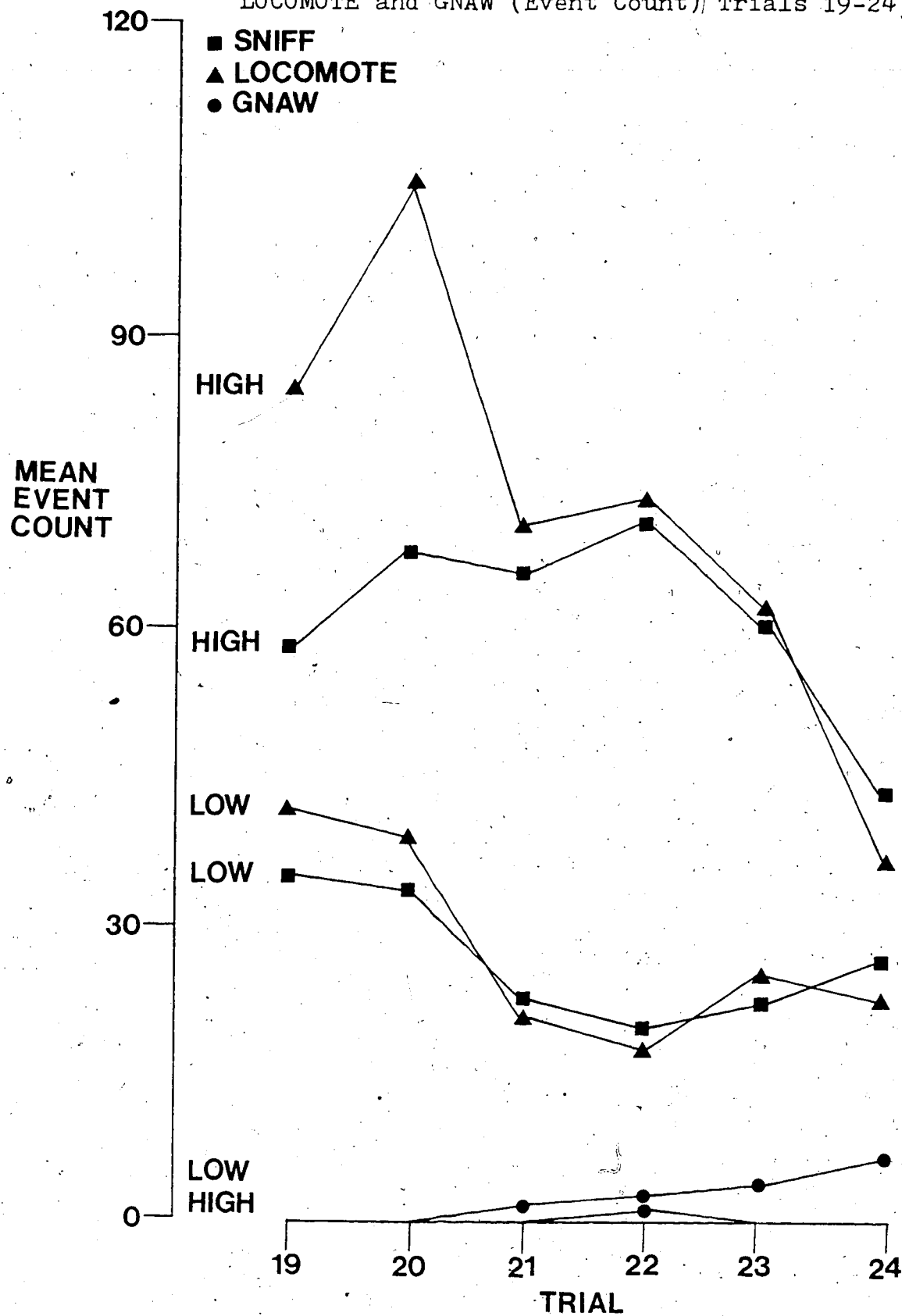


FIGURE 47

HIGH versus LOW Locomote Groups for SNIFF, LOCOMOTE and GNAW (Event Count) Trials 19-24



the trial effect for jump was due to the greater event count for the low locomote group on Trials 7 to 24. The high locomote group showed a slightly higher event count for jump on Trials 1 to 6.

Group X Trial Interaction. (Appendix, ANOVA: Tables 85-97; Mean Values(SEM): Tables 108-122) Significant group x trial interactions were found for locomote, sniff, gnaw and headdown for both dependent measures, for rear for event duration and for nod for event count.

In general, the significant group x trial interactions were due to the general increase in event count across all 24 trials for the high locomote group whereas the low locomote group remained relatively stable across all 24 trials and across trials within sessions. Event duration and event count of locomote were greater across all trials for the high locomote than the low locomote group.

For locomote, for event duration, both the high and low locomote groups tended to decrease across trials within each session where the high locomote group showed larger magnitude decreases than the low locomote group across trials within each session. Similar patterns were found for the high and low locomote groups for event count.

Paralleling locomote, event duration and event count of sniff were greater across trials for the high than the low locomote group. The significant group x trial interaction for sniff was due to relatively stable trial means for event duration across all trials for the high locomote group.

whereas the trial means for the low locomote group decreased across trials within each session for event duration. For event count, trial means for the high locomote group increased across sessions and decreased within sessions whereas in the low locomote group, trial means tended to decrease across sessions and across trials.

Mean event duration of rear was stable across trials for the high locomote group whereas the event duration of rear for the low locomote group increased across trials.

For gnaw, the significant group x trial interaction was due to the low event count and duration of gnaw which remained stable across trials for the high locomote group. The low locomote group showed consistently higher event count and event duration across trials than did the high locomote group. Event count and event duration decreased across trials for the low locomote group.

Event count for nod showed a significant group x trial interaction as a result of the gradual decline in the event count of nod for the high locomote group across trials whereas the low locomote group showed a large decrease from Trials 1 to 6 to Trials 7 to 12 with subsequent gradual decline across the remaining trials.

The significant group x trial interaction for headdown for event duration was due to the relatively higher event duration and event count in the high locomote than in the low locomote group.

In summary, locomote and sniff were greater for the

high locomote group than the low locomote group for both dependent measures. The same was true of gnaw for the low locomote group where gnaw was greater in event duration and event count than in the high locomote group. In addition, mean event duration for headdown was greater in the high than in the low locomote group. No group differences were found for rear, nod or jump on either of the dependent measures.

Group Differences Across Trials. (Appendix, t-Tests: Tables 98-107; Mean Values(SEM): Tables 110-122) For all t-tests, the probability level .05 was set as the minimum level at which the effects attained significance.

A series of t-tests between the high and low locomote groups across trials indicated that the greatest number of group differences occurred for the behaviors locomote, sniff and gnaw and that the high and low groups were most similar on rear, nod and headdown.

The high and low locomote groups differed significantly on Trials 1 to 14, 15 and 19 to 23 for locomote where the event duration of locomotion was greater on all significant trials for the high locomote groups. The event count for locomote was significantly greater for the high locomote than the low locomote group on Trials 2 to 4, 6 to 10, 13 to 15, 18 and 20 to 23. Similarly, the high locomote group showed significantly greater event durations of sniffing than the low locomote group on Trials 2 to 6, 10, 11, 16, 18 and 23 and significantly greater event count

for sniff on Trials 2 to 11 and 13 to 24.

Unlike locomote and sniff, the low locomote group was consistently greater than the high locomote group for gnaw on Trials 3 to 6, 9 to 11, 16, 17 and 24 for event duration and on Trials 2 to 6, 10, 11 and 17 for event count.

Few significant differences were found between groups for rear, headdown and nod with the low locomote group showing significantly longer duration of rear on Trial 22 than the high locomote group and significantly greater event duration and event count for nod on Trial 2 than the high locomote group. No significant differences were found for rear for event duration. No significant differences between groups were found on any trials for headdown for both dependent measures except Trial 13 for event duration. Because the behavior jump occurred with low frequency, or did not occur on many trials, it was omitted from this analysis.

In summary, individual differences within the apomorphine group were most evident for the behaviors locomote, sniff and gnaw with high locomoters showing longer durations and greater frequencies of locomotion and sniffing than the low locomoters which showed greater durations and frequencies of gnaw. Few group differences were indicated for the behaviors rear, nod and headdown with jump occurring too infrequently in both groups to be included in the analysis. In addition, significant group

differences tended to appear toward the end of the series of trials within each day for locomote, sniff and gnaw for both dependent measures.

Emotionality

The saline and apomorphine groups were each tested for pretest and posttest reactivity to four stimuli: poke, brush, noise and lift to determine if acute and chronic administration of apomorphine resulted in greater posttest reactivity and to determine if the habituation noted across sessions in the saline group was accompanied by a decrease in posttest reactivity. In addition, the reactivity of the apomorphine group was compared with that of the saline group on both pretest and posttest measures of reactivity.

Few significant differences were found between pre- and posttest reactivity within both the apomorphine and the saline groups (Appendix, Tables 123, 124). Within the apomorphine group, significant differences were found between pre- and posttest responses to noise on Session 4 where pretest reactivity was greater than posttest reactivity. Within the saline group, posttest reactivity differed significantly from pretest reactivity for brush on Session 1 and for noise on Session 2 where posttest reactivity was greater than pretest reactivity for both stimuli.

Similarly, few significant differences were found between the apomorphine and saline groups for both pretest and posttest measures of reactivity. For the pretest

measures, the saline group was significantly more reactive to brush in Session 1, noise in Session 3 and lift in Session 1. The apomorphine group was significantly more reactive than the saline group to lift in Session 3. For the posttest measures, the apomorphine group was significantly more reactive to noise in Session 2 than was the saline group (Appendix, Tables 125, 126).

In summary, pretest and posttest reactivity were relatively unaffected by acute and chronic apomorphine administration as well as by saline administration. In addition, the apomorphine and saline groups generally did not differ on pretest and posttest reactivity to the four stimuli.

Discussion

A Critique of Rating Scales

Three issues arise from the use of rating scales of behavior. First, rating scales often confound behaviors by including two discrete behaviors within a single category. Second, rating scales employ categories based on the underlying assumption of continuity of behaviors in time. The third assumption is that judgements as to the categorical membership of a particular behavior with respect to the rating scale can be made consistently. These three assumptions associated with rating scales obscure important distinctions among behaviors seen as a result of apomorphine treatment.

Rating scales are often constructed such that the lowest level of the scale corresponds to discontinuous sniffing or mouthing behaviors. The high intensity point on the scale generally consists of a category containing continuous sniffing, biting, licking or combinations of these behaviors (e.g. Costall & Naylor, 1973; Puech, Chermat, Poncelet, Doare & Simon, 1981).

The results of this study indicate that grouping behaviors such as sniff and gnaw together within one category is done under the erroneous assumption that these two behaviors necessarily occur together in the same way.

In the relatively greater number of events of sniff in the apomorphine group, as opposed to the saline group, the present results agree with Fray et al. (1980).

However, no differences were found between the two groups in terms of event duration or the composite measure total time. In view of these results, rating scales become suspect. High intensity categories generally include continuous sniffing as a criterion for a high degree of stereotypy. However, from this general definition, it is unclear as to whether continuous means long duration or high frequency. From the present results it is clear that the two measures create two different impressions as to the status of sniff in the apomorphine group as opposed to the saline group. The essential discriminating variable, in this instance, is in the frequency of the behavior sniff, not in its duration or in the total time spent engaging in this behavior.

The importance of discriminating among dependent measures is also shown by other behaviors, both within the saline and apomorphine groups. In contrast to sniff, both gnaw and nod showed decreases in duration and frequency within days. Since gnaw and nod are most frequently associated with intense stereotypy, and since continuous sniffing is usually included among categories representing intense stereotypy, for the rating scale method to be valid, both sniff and gnaw should differ from the saline group along the same dimension. It was found that they do not.

This finding poses some problems for the use of rating scales. First, there can be no comparison made

between gnaw as shown by the apomorphine group and sniff as shown by the saline group. The reason for this is that sniff is shown to be of higher frequency in the apomorphine group than the saline group. Durations do not differ. However, actual gnawing does not occur at all within the saline group. Therefore, only a spurious comparison could be made which would state that the apomorphine group showed a greater duration and frequency of gnaw than the saline group. Extending this point further, even if such an apomorphine-saline comparison were possible, sniff would not be comparable to gnaw since it differs from the saline group on only the frequency measure, not the duration.

This leads to the second assumption underlying the use of rating scales: the assumption that stereotypic behavior represents an extreme point on an underlying continuum of behavior. The present results suggest that the behaviors across the categories imposed by rating scales are discrete in terms of different behaviors such as sniff and gnaw but identical in terms of the same behaviors included across categories, such as sniff. Viewing the time courses of different behaviors will clarify this point.

Among apomorphine-treated animals, sniff tends to appear early in the session and to be present across the entire session. Chronic administration of apomorphine does not alter this pattern: sniff still occurs early

within a session and is apparent across the entire session. Trial by trial correlations for sniff indicated that its pattern of occurrence across trials within the first session was fairly uniform. However, trials within Session 1 showed few intercorrelations with trials in other sessions. It was also found that trials within and between Sessions 2, 3 and 4 were highly intercorrelated. That duration, total time and event count were found to decrease across trials within Session 1 and that duration, event count and total time spent tended to peak near mid-session, then decrease for Sessions 2, 3 and 4, indicates that apomorphine in acute and chronic doses alters the time course of these behaviors. However, there is no indication in this data or from the actual observations that sniffing, as a behavior, is different under acute and under chronic apomorphine treatment.

By the same argument, there is, therefore, no reason to believe that sniff occurring within the same trial as gnaw is qualitatively different from sniff as it occurs in the same session with groom, for example. The difference in the manifestation of sniff under the two circumstances is quantitative as shown both by measures of its occurrence (event duration, total time and event count) and measures of its time course (session effect, trial effect, interaction effect and trial by trial intercorrelation). This leads to the conclusion that sniff does not represent an early point on a continuum

of stereotypy but is a discrete behavior that is quantitatively, not qualitatively, altered by the action of apomorphine. In general, there is growing support for this conclusion (Ljungberg & Ungerstedt, 1977b; Sahakian & Robbins, 1975).

Rating scales also make an assumption of the continuity of behavior in time. For example, rating scales generally suggest that gnawing behavior emerges after sniffing has reached a high frequency of occurrence. The present data do not support this assumption. In contrast, it was found that sniffing generally decreased across the final three trials within a session whereas gnawing tended to peak during the final three trials within a session for the high locomote group. The data derived from the low locomote group also do not support the continuity of sniff and gnaw across time. As with the high locomote group, sniff tended to decrease on the final three trials within a session whereas gnaw remained at a low, stable level across all trials within a session.

In conclusion, then, the assumptions of the continuity of the intensity of behavior in time and the continuity of the occurrence of behaviors in time are not supported by the present results.

The final issue with respect to rating scales is that of the subjectivity necessary in assigning a rating to a particular behavior. In describing the behavior of saline-treated rats, the present results indicated that

saline-treated animals engage primarily in grooming, inactivity, rearing and some locomoting. It was also found that rearing, locomoting and grooming were most frequent during the early trials within each session and during the earlier testing sessions whereas inactivity increased dramatically during the final trials within sessions and during the later behavioral testing sessions. These results indicate that the behavior of saline-treated animals is dynamic; their behavior changes across time within and between sessions as does behavior shown by drug-treated animals. Rating scales generally use the behavior of the saline-treated rat as the category of lowest intensity, a baseline against which drug-induced behavior can be assessed. However, saline-induced behavior is described as "that of a saline treated rat". Since saline-induced behavior was found to change across time, then behavior described as "that of a saline treated rat" must also change across time. As a consequence, continual subjective judgements must be made as to the categorical membership of a drug-induced behavior but these judgements must be made in terms of a sliding baseline as shown by the non-homogenous behavior of the saline-treated rats across time.

In summary, behaviors generally assumed to represent different qualitative aspects of a single dimension (stereotypy) are in fact qualitatively different from each other (e.g. gnaw and sniff). In addition, single

behaviors differ quantitatively, not qualitatively, across intensity levels and across time and as such cannot be represented as continuous measures along a single dimension. Finally, rating scales require subjective judgements to be made as to the categorical membership of a particular behavior. However, these judgements are not made against a constant point of reference but against a sliding baseline since saline-induced behavior varies across time.

On the Importance of Dependent Measures

A description of the behavior of saline control group animals is essential if comparisons are to be made between the saline-treated and a drug-treated group. The saline group's behavior can be understood, initially, in terms of description and then in terms of comparison with apomorphine-treated animals.

When discussing the behavioral effects of apomorphine, it is generally agreed that one or both of gnawing and high rates of locomoting are induced by apomorphine. This study includes the categories nod, headdown and jump as part of the apomorphine-induced behavioral repertoire. However, some important observations have been overlooked in this simple description.

First, the behaviors gnaw, nod, headdown and jump are not only introduced by apomorphine treatment, they

are completely absent from the saline group. Second, the effect of apomorphine is to completely remove the behaviors groom and inactive from the apomorphine-treated animals' repertoires; only the saline-treated animals show these behaviors. Third, there are only three behaviors which the apomorphine and saline groups have in common: locomote, rear and sniff.

The above description has several implications for the description of apomorphine-induced behaviors. If the effects of apomorphine on normal rat behavior are of interest, direct comparisons between normal and drug-treated rats are only possible if sniff, rear and locomote are used as the behaviors being compared. However, if stereotypy is of interest, quantitative comparison is only possible within the drug-treated group. Only a qualitative comparison can be made between apomorphine-induced stereotypic behaviors and the behavior displayed by the saline-treated group, namely, that one group shows a particular behavior and the other group does not.

Since so few behaviors are common to both groups, in order to get maximum discrimination between the two groups, it is important to define the measures that are most sensitive in describing the differences. The results of these comparisons from the present study serve to illustrate the possible pitfalls of using single dependent measures for this purpose.

The saline and apomorphine groups were found to differ on event count, event duration and total time for locomote. For this behavior, single dependent measures of either the frequency or duration would have detected an effect. However, as stated above, the saline and apomorphine groups differed only on event count for sniff. Studies employing only measures of duration would have found group differences for locomote, but no group differences for sniff and therefore would present a distorted pattern of the overall behavior by implying that the pattern of sniffing was the same in the two groups. The third common behavior, rear, was not found to differ between the two groups on any of the dependent measures. In viewing the time course of this behavior, it was found that rear increased across trials for the saline group whereas rear decreased across trials for the apomorphine group for all three dependent measures.

Several recommendations follow from the above observations. First, when comparing apomorphine-treated with saline-treated animals, multiple dependent measures should be used since, as illustrated by the behavior sniff, it is possible for frequencies of behaviors to vary between groups without concomitant changes in duration. Second, even multiple dependent measures will not detect uniform changes in opposite directions between groups (interaction). Therefore, a measure should be included which describes behavior across observation periods in

order to obtain a complete and accurate representation of the behavior being observed. For the reasons stated above, a measure of time course is essential even if non-parametric analyses are being used.

Acute Versus Chronic Apomorphine Administration

Few studies have described the effects of chronic apomorphine treatment alone, without superimposing a second drug challenge on the ongoing behavior. Therefore, a brief description of acute versus chronic effects of apomorphine across behaviors will be provided.

It has been suggested that chronic apomorphine treatment results in the introduction of gnawing into the rat's behavioral repertoire (Porecca et al., 1982). In general, however, this point is not supported by the present data. In contrast, gnawing behavior was found among the apomorphine treated animals following acute injection of 5 mg/kg apomorphine. These findings agree with those of Olpe (1978) who found biting was present after acute administration of high doses of apomorphine. In addition, nod, jump and headdown were seen in some animals after acute apomorphine injection.

More interestingly, the nature of the stereotyped responses did not change across days, as Friedman et al., (1975) observed. Also, the mean event counts, durations and total time spent in the stereotypic behaviors gnaw and nod decreased across days while the frequency of jumping increased. These results are in contrast to those

of Flemenbaum (1979) who failed to find any change in stereotyped behavior in chronic apomorphine-treated animals. That these conflicting results are due to different doses of apomorphine are unlikely in view of the findings of Costall, Hui and Naylor (1980) and Cools (1977) where no dose dependency was found.

Opposing the decreases of stereotypic behaviors across days, locomote, rear and sniff were all found to increase across days. In addition, the trial by trial correlations indicated that trials within Session 1 were highly intercorrelated whereas Session 1 showed low intercorrelations with other three sessions for locomote, rear and sniff. However, Sessions 2, 3 and 4 generally showed high intercorrelations between and within sessions. This contrasts with the finding that within and between session correlations were fairly uniform for the stereotypic behaviors gnaw and nod.

An important implication arises from these findings. The chronic effects of apomorphine are usually described in terms of the effect of multiple injections on stereotypic behavior (Porecca et al., 1982). However, the present results indicate that the behaviors gnaw and nod are introduced at fairly high frequencies and durations at the time of first injection and that the time courses of these behaviors remain relatively stable across sessions. In other words, acute and chronic apomorphine treatments do not seem to differentially affect these behaviors.

The main behaviors affected by acute versus chronic administration of apomorphine are the behaviors that are common to both saline and apomorphine treated animals and which are part of the normal animal's repertoire: locomote, sniff and rear. Not surprisingly, these behaviors showed characteristic increases across sessions for the apomorphine-treated group. However, the patterns of intercorrelations for these behaviors suggest that patterns of behavior change within Session 1 differ substantially from the patterns of behavior change across trials in Sessions 2, 3 and 4.

The above findings suggest that attempts to describe the chronic effects of apomorphine in terms of stereotypic behavior may be misdirected in that the chronic effects of apomorphine become manifest only in the expression of "normal" behaviors while merely sustaining the stereotypic behaviors.

Individual Differences

Costal, Hui and Naylor (1980) found that treatment of rats with (-)-N-n-propylnorapomorphine stimulated locomotor activity in some rats yet failed to affect locomotion in other rats treated in the same way. Ljungberg and Ungerstedt (1977) found two distinct time courses for the behaviors gnaw and nod as did Fray et al. (1980) with locomote generally appearing before gnaw. Szechtman et al., (1982) found strain differences between rats as exhibited by different behavior patterns which were not attributed to

the duration of apomorphine action but to "other factors".

Common to all of the studies cited above is the assumption that the results found are due to differences in experimental design (Fray et al., 1980; Ljungberg & Ungerstedt, 1977a) and to factors related to experimental design (Szechtman et al., 1982). The results of this experiment support the behavioral findings of these studies to some extent in that high rates of locomotion tend to occur in some animals whereas high levels of gnawing occur in different animals.

In general, the behavior opposing the predominant behavior is of low frequency and duration. This pattern held even though animals were divided into groups based on the criterion of locomote duration. That the high locomote group showed higher duration and frequency of locomote on all trials than the low locomote group and that the low group showed consistently higher frequency and duration of gnaw than the high group support the criterion used to divide the groups. More importantly, these results suggest that two separate subgroups of individuals exist among apomorphine-treated animals. Interestingly, individual differences between these two groups were not apparent for the behaviors nod and rear.

Of note in regard to the behaviors nod and rear are the findings reported by Szechtman et al. (1982) who showed that even though two different types of behavior were found, the distinguishing feature of apomorphine-

induced behavior, common to all animals, was the constant "snout contact" he observed. Snout contact was defined as keeping the snout within a few millimeters of a surface. In general, the most comparable behaviors to snout contact employed in this study would be nod and rear. That no differences between the high and low locomote groups on these behaviors were found may support Szechtman's (1982) contention that the defining feature of apomorphine-induced behavior is snout contact. However, in view of the fact that the saline group and the apomorphine group as a whole did not differ on any of the dependent measures of rear, these conclusions must be viewed as tentative. The low frequency in general of the behavior headdown supports this caution.

Of importance in describing the overall behavior of an apomorphine-treated animal is clarity of description. Ideally, the behavior of an animal could be described simply in terms of a few discriminating features. This method of description was used by Ljungberg (1979) who described a rat's behavior as consisting of early onset of locomote (LS type of behavior) which shifted to gnaw (G type of behavior) later in the observation period. However, the subpopulations found within the present study cast doubt on the fact that such a rat exists. When viewed in its entirety (N=20), the apomorphine group would show a time course of behavior similar to that shown by Ljungberg (1979). Careful observation showed that

high rates of locomotion appeared soon after injection in one distinct group of animals who showed wither the absence of gnawing or very low frequencies of gnawing. The same was true of gnawing behavior. Gnawing did tend to appear toward the end of a session but only in one group of rats which was found to be distinct from the group showing high rates of locomotion.

Similar findings were reported by Belova, Kvetnansky, Dobrakovova, Oprsalova and Ivanova (1981) who identified two subgroups of animals based on locomotor activity. They further attempted to differentiate among these animals on the basis of emotionality where rats displaying low motor activity displayed greater emotionality than the high locomotor group. Porecca et al. (1982) also suggested that chronic apomorphine administration results in an increased state of excitement. Although not directly comparable, the present study did not find any evidence indicating that rats were any more reactive to the stimuli poke, brush, noise and lift after acute and subsequent administrations of apomorphine than before apomorphine treatment.

The definition of two subpopulations of animals within a single drug-treatment group simplifies the description of apomorphine-induced behavior by removing the necessity of explaining the wide variation among apomorphine-treated animals in terms of experimental design. However, in a sense the need for an explanation

of the induction of two behaviors by apomorphine has not been eliminated but shifted from the realm of physical explanation to the realm of pharmacological explanation. If the two subpopulations are indeed not a result of differential experimental manipulation, they must be due to the action of apomorphine itself and as such require a pharmacological explanation.

Two major mechanisms of the action of apomorphine have been proposed, one suggesting that anatomically distinct sites of action are responsible for the observed pair of behaviors and one suggesting that properties of the dopaminergic neuron contribute to the differential effects observed.

In general, direct administration of apomorphine to the corpus striatum has been found to increase "stereotyped sniffing" behavior while having no effect on locomotion (Van Ree, 1982). Apomorphine administration to the nucleus accumbens was found to enhance high rates of locomotion (Costall, Domeney & Naylor, 1982; Costall, Hui & Naylor, 1980; Ungerstedt & Ljungberg, 1977).

Kenny and Leonard (1980) have suggested that two distinct types of dopamine receptors exist that promote different responses when stimulated with apomorphine. Puech et al. (1981) have postulated that the two dopamine receptor types (DA_1 and DA_2) are differentially sensitive to apomorphine stimulation with DA_1 (postsynaptic) stimulation resulting in stereotypic behavior and DA_2

receptors (presynaptic or postsynaptic) resulting in hypothermia and hypomotility. Complicating these models are the suggestions by Maj, Grabowska and Gajda (1972) that noradrenergic neurons may also be involved in the central control of motility and by Grabowska, Antkiewicz, Maj and Michaluk (1973) who discuss the importance of central serotonin neurons in modulating the effect of apomorphine.

Clearly a structural mechanism is insufficient to describe the behavior of the two subpopulations since systemic administration (sub-cutaneous) as employed in this study was able to produce both behavioral responses. There is more promise in mechanisms that include two populations of receptors with differential sensitivities to apomorphine. However, the task of defining the mechanism underlying apomorphine-induced individual differences is truly a formidable one that would benefit from clear and concise descriptions of behavioral responses, from which mechanisms, or at least hypotheses as to possible mechanisms, can be inferred.

This study represented an attempt to clarify the behavioral issues involved in the study of apomorphine-induced behavior and thereby remove some of the confusion encountered when attempting to infer dopaminergic function from apomorphine-induced behavior.

References

- Anden, N.-E., Rubenson, A., Fuxe, K. and Hokfelt, T.
Evidence for dopamine receptor stimulation by
apomorphine. J. Pharm. Pharmacol., 1967, 19,
627-629.
- Belova, T., Kvetnansky, R., Dobrakovova, M., Oprasalova, Z.,
and Ivanova, T. Catecholamines in brain structures
of rats distinguished by performance in the open
field test. Bulletin of Exper. Biol. and Med.,
1981, 91, 105-108.
- Butterworth, R.F. and Barbeau, A. Apomorphine:
stereotyped behavior and regional distribution in
rat brain. Can. J. Biochem, 1975, 53, 308-311.
- Cohen, J. A coefficient of agreement for nominal scales.
Educational and Psychological Measurement, 1960,
20, 37-46.
- Cools, A.R. Two functionally and pharmacologically
distinct dopamine receptors in the rat brain. In
E. Costa and G.L. Gessa, Advances in Behavioral
Psychopharmacology. New York: Raven Press, 1977,
215-225.
- Cools, A.R., Broekkamp, C.L.E. and Van Rossum, J.M.
Subcutaneous injections of apomorphine, stimulus
generalization and conditioning: serious pitfalls for
the examiner using apomorphine as a tool. Pharmacol.,
Biochem. and Behav., 1977, 6, 705-708.
- Costall, B. and Naylor, R.J. On the mode of action of

- apomorphine. Eur. J. Pharmacol., 1973, 21, 350-361.
- Costall, B., Domeney, A.M. and Naylor, R.J. Behavioral and biochemical consequences of persistent over-stimulation of mesolimbic dopamine systems in the rat. Neuropharmacol., 1982, 21, 327-335.
- Costall, B., Hui, S.-C.G. and Naylor, R.J. Denervation in the dopaminergic mesolimbic system: functional changes followed using (-)N-n-propylnorapomorphine depend on the basal activity levels of rats. Neuropharmacol., 1980, 19, 1039-1048.
- Creese, I. and Iversen, S.D. Blockage of amphetamine-induced motor stimulation and stereotypy in the adult rat following neonatal treatment with 6-hydroxydopamine. Brain Res., 1973, 55, 369-382.
- Divac, I. Drug-induced syndromes in rats with large chronic lesions in the corpus striatum. Psychopharmacologia, 1972, 27, 171-178.
- Draper, W.A. A behavioral study of the home-cage activity of the white rat. Behavior, 1967, 28, 280-293.
- Ellingwood, E.H. and Balster, R.L. Rating the behavioral effects of amphetamine. Eur. J. Pharmacol., 1974, 27, 35-41.
- Ernst, A.M. Mode of action of apomorphine and dexamphetamine on gnawing compulsion in rats. Psychopharmacologia, 1967, 10, 316-323.
- Flemenbaum, A. Failure of apomorphine to induce dopamine receptor hypersensitivity. Psychopharmacol, 1979,

62, 175-179.

Fray, P.J., Sahakian, B.J., Robbins, T.W., Koob, G.F. and Iversen, S.D. An observational method for quantifying the behavioral effects of dopamine agonists: contrasting effects of d-amphetamine and apomorphine. Psychopharmacol., 1980, 69, 253-259.

Friedman, E., Rotrosen, J., Gurland, M., Lambert, G.A. and Gershon, S. Enhancement of reserpine-elicited dopamine super-sensitivity by repeated treatment with apomorphine and γ -methylparatyrosine. Life Sci., 1975, 17, 867-873.

Grabowska, M., Antkiewicz, L., Maj, J. and Michaluk, J. Apomorphine and central serotonin neurons. Pol. J. Pharmacol. Pharm., 1973, 25, 29-39.

Hoglund, A.U. and Meyerson, B.J. Effects of lysine-vasopressin in an exploratory behavior test situation. Physiol. and Behav., 1982, 29, 189-193.

Kebanian, J.W., Petzold, G.E. and Greengard, P. Dopamine-sensitive adenylate cyclase in caudate nucleus of rat brain, and its similarity to the "dopamine receptor". Proc. Nat. Acad. Sci., (U.S.A.), 1972, 69, 2145-2149.

Kenny, M. and Leonard, B.E. Behavioral effects of chronic treatment with apomorphine in combination with neuroleptic drugs. J. Neuroscience Res., 1980, 5, 291-298.

Kenny, M., Lynch, M., and Leonard, B.D. Induction of two

distinct behavioral responses by chronic treatment with apomorphine. J. Neuroscience Res., 1980, 5, 35-42.

Ljungberg, T. Evidence that time-related changes in apomorphine stimulation determines the behavioral response. Neuropharmacol., 1979, 18, 327-334.

Ljungberg, T. and Ungerstedt, T. Apomorphine-induced locomotion and gnawing: evidence that the experimental design greatly influences gnawing while locomotion remains unchanged. Eur. J. Pharmacol., 1977a, 46, 147-151.

Ljungberg, T. and Ungerstedt, U. Different behavioral patterns induced by apomorphine: evidence that the method of administration determines the behavioral response to the drug. Eur. J. Pharmacol., 1977b, 46, 41-50.

Maj, J., Grabowska, M. and Gajda, L. Effect of apomorphine on motility in rats. Eur. J. Pharmacol., 1972, 17, 208-214.

Marcais, H., Protais, P., Costentin, J. and Schwartz, J.C. A gradual score to evaluate the climbing behavior elicited by apomorphine in mice. Psychopharmacol., 1978, 56, 233-234.

Meyerson, B.J. and Hoglund, A.U. Exploratory and socio-sexual behavior in the male laboratory rat: a methodological approach for the investigation of drug action. Acta Pharmacol. et Toxicol., 1981,

48, 168-180.

Norton, S. Amphetamine as a model for hyperactivity in the rat. Physiol. and Behav., 1973, 11, 181-186.

Olpe, H.R. Pharmacological manipulations of the automatically recorded biting behavior evoked in rats by apomorphine. Eur. J. Pharmacol., 1978, 51, 441-448.

Porecca, F., Cowan, A. and Tallarida, R.J. Differentiation of apomorphine from bromocriptine, piribidel and TRH by chronic administration in rats. Psychopharmacol., 1982, 76, 70-74.

Puech, A., Chermat, R., Poncelet, M., Doare, L. and Simon, P. Antagonism of hypothermia and behavioral response to apomorphine: a simple, rapid and discriminating test for screening antidepressants and neuroleptics. Psychopharmacol., 1981, 75, 84-91.

Randrup and Munkvad, I. Stereotyped activities produced by amphetamine in several animal species and man. Psychopharmacologia, 1967, 11, 300-310.

Riffée, W.H., Wilcox, R.E. and Smith, R.V. Modification of drug-induced behavioral arousal by preinjection routes in mice. Psychopharmacol., 1979, 63, 1-5.

Sahakian, B.J. and Robbins, T.W. Potentiation of locomotor activity and modification of stereotypy by starvation in apomorphine treated rats. Neuropharmacol., 1975, 14, 251-257.

Siggins, G.J., Hoffer, B.J. and Ungerstedt, U. Electrophysiological evidence for involvement of

- cyclic adenosine monophosphate in dopamine responses of caudate neurons. Life Sci., 1974, 15, 779-792.
- Szechtman, H., Ornstein, K., Teitelbaum, P. and Golani, I. Snout contact fixation, climbing and gnawing during apomorphine stereotypy in rats from two substrains. Eur. J. Pharmacol., 1982, 80, 385-392.
- Tolosa, E.S., Cotzias, G.C., Burckhardt, P.G., Tang, L.C. and Dahl, K.E. The dopaminergic and antidopaminergic effects of some aporphines. Exper. Neurol., 1977, 55, 56-66.
- Ungerstedt, U. and Ljungberg, T. Behavioral patterns related to dopamine neurotransmission: effect of acute and chronic antipsychotic drugs. In E. Costa and G.L. Gessa (Eds.), Advances in Biochem. Psychopharm., 16, New York: Raven Press, 1977.
- Van Ree, J.M. Non-opiate β -endorphin fragments and dopamine-II β -endorphin 2-9 enhances apomorphine-induced stereotypy following subcutaneous and intrastriatal injection. Neuropharmacol., 1982, 21, 1103-1109.

APPENDIX

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TABLE 1

ANOVA Table for LOCOMOTE (Total Time)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	2.174	35.57	.001
Sw (subject)	27	.061		
S (session)	3	.014	1.80	ns
D X S	3	.054	6.88	.001
SSw	81	.008		
T (trial)	5	.183	30.10	.001
D X T	5	.024	3.93	.002
TSw	135	.006		
S X T	15	.001	.70	ns
D X S X T	15	.006	2.94	.001
STSw	405	.002		

NOTE: Drug = 2 groups: Apomorphine (N=20), Saline (N=9)
 Session = 4 sessions
 Trial = 6 trials

TABLE 2

ANOVA Table for REAR (Total Time)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	.747	1.64	ns
Sw (subject)	27	.456		
S (session)	3	.061	.97	ns
D X S	3	.328	5.23	.002
SSw	81	.063		
T (trial)	5	.051	7.15	.001
D X T	5	.012	1.69	ns
TSw	135	.007		
S X T	15	.006	.81	ns
D X S X T	15	.004	.50	ns
STSw	405	.007		

TABLE 3

ANOVA Table for SNIFF (Total Time)

Source _{ey}	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	.04	.06	ns
Sw (subject)	27	.70		
S (session)	3	.15	1.78	ns
D X S	3	.14	1.68	ns
SSw	81	.09		
T (trial)	5	.49	9.87	.001
D X T	5	.36	7.35	.001
TSw	135	.05		
S X T	15	.05	2.73	.001
D X S X T	15	.11	5.56	.001
STSw	405	.02		

TABLE 4

ANOVA Table for GNAW (Total Time)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	.38		
S (session)	3	.35	6.88	.001
SSw	57	.05		
T (trial)	5	.27	6.66	.001
TSw	95	.04		
S X T	15	.02	3.01	.001
STSw	285	.01		

TABLE 5

ANOVA Table for NOD (Total Time)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	.05		
S (session)	3	.35	9.15	.001
SSw	57	.04		
T (trial)	5	.05	7.82	.001
TSw	95	.01		
S X T	15	.01	2.76	.001
STSw	285	.01		

TABLE 6

ANOVA Table for JUMP (Total Time)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	.004		
S (session)	3	.002	1.82	ns
SSw	57	.001		
T (trial)	5	.002	2.48	.037
TSw	95	.001		
S X T	15	.001	1.62	ns
STSw	285	.001		

TABLE 7

ANOVA Table for GROOM (Total Time)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	8	.05		
S (session)	3	.02	1.39	ns
SSw	24	.01		
T (trial)	5	.04	2.11	ns
TSw	40	.02		
S X T	15	.02	1.04	ns
STSw	120	.02		

TABLE 8

ANOVA Table for INACTIVE (Total Time)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	8	.76		
S (session)	3	.70	5.17	.007
SSw	24	.13		
T (trial)	5	1.16	11.78	.001
TSw	40	.10		
S X T	15	.10	2.32	.006
STSw	120	.05		

TABLE 9

ANOVA Table for LOCOMOTE (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	2288.44	54.74	.001
Sw (subject)	27	41.81		
S (session)	3	85.89	8.32	.001
D X S	3	56.11	5.43	.002
SSw	81	10.33		
T (trial)	5	160.25	45.95	.001
D X T	5	11.18	3.21	.009
TSw	135	3.49		
S X T	15	1.95	1.14	ns
D X S X T	15	4.38	2.58	.001
STSw	405	1.70		

TABLE 10

ANOVA Table for REAR (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	84.88	.32	ns
Sw (subject)	27	7248.93		
S (session)	3	13.31	.17	ns
D X S	3	753.86	9.84	.001
SSw	81	2068.44		
T (trial)	5	388.26	17.60	.001
D X T	5	102.80	4.66	.001
TSw	135	595.62		
S X T	15	57.83	1.12	ns
D X S X T	15	39.59	.76	ns
STSw	405	1400.11		

TABLE 11

ANOVA Table for SNIFF (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	49.90	.33	ns
Sw (subject)	27	153.18		
S (session)	3	236.74	4.25	.008
D X S	3	42.22	.76	ns
SSw	81	55.65		
T (trial)	5	223.08	16.57	.01
D X T	5	104.34	7.75	.01
TSw	135	13.46		
S X T	15	17.02	2.44	.002
D X S X T	15	29.44	4.21	.001
STSw	405	6.99		

TABLE 12

ANOVA Table for GNAW (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	220.07		
S (session)	3	147.61	6.86	.001
SSw	57	21.53		
T (trial)	5	133.71	6.76	.001
TSw	95	19.78		
S X T	15	8.73	2.79	.001
STSw	285	3.14		

TABLE 13

ANOVA Table for NOD (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	23.09		
S (session)	3	357.28	15.80	.001
SSw	57	22.61		
T (trial)	5	72.94	14.23	.001
TSw	95	5.13		
S X T	15	9.62	2.73	.001
STSw	285	3.52		

TABLE 14

ANOVA Table for HEADDOWN (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	1.10		
S (session)	3	2.30	3.43	.023
SSw	57	.67		
T (trial)	5	.83	5.78	.001
TSw	95	.14		
S X T	15	.28	2.25	.005
STSw	285	.12		

TABLE 15

ANOVA Table for GROOM (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	8	35.25		
S (session)	3	41.38	3.16	.043
SSw	24	13.09		
T (trial)	5	38.13	2.78	.030
TSw	40	13.70		
S X T	15	12.80	1.04	ns
STSw	120	12.28		

TABLE 16

ANOVA Table for INACTIVE (Event Duration)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	8	334.18		
S (session)	3	177.93	4.44	.013
SSw	24	40.07		
T (trial)	5	425.64	11.73	.001
TSw	40	36.30		
S X T	15	22.22	1.51	ns
STSw	120	14.75		

TABLE 17

ANOVA Table for LOCOMOTE (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	191439.06	33.00	.001
Sw (subject)	27	5801.24		
S (session)	3	154.98	.24	ns
D X S	3	9207.93	14.14	.001
SSw	81	651.05		
T (trial)	5	10262.84	17.03	.001
D X T	5	1709.29	2.84	.018
TSw	135	602.68		
S X T	15	200.80	.99	ns
D X S X T	15	747.97	3.68	.001
STSw	405	203.47		

TABLE 18

ANOVA Table for REAR (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	286.11	.66	ns
Sw (subject)	27	431.70		
S (session)	3	207.25	5.79	.001
D X S	3	732.61	20.47	.001
SSw	81	35.79		
T (trial)	5	840.08	29.60	.001
D X T	5	230.39	8.12	.001
TSw	135	28.38		
S X T	15	11.40	.94	ns
D X S X T	15	31.96	2.63	.001
STSw	405	12.16		

TABLE 19

ANOVA Table for SNIFF (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
D (drug)	1	95164.75	23.65	.001
Sw (subject)	27	4023.19		
S (session)	3	1983.04	6.72	.001
D X S	3	5554.19	18.81	.001
SSw	81	295.31		
T (trial)	5	5699.03	27.63	.001
D X T	5	472.92	2.29	.049
TSw	135	206.28		
S X T	15	170.63	1.66	ns
D X S X T	15	167.48	1.62	ns
STSw	405	103.12		

TABLE 20

ANOVA Table for HEADDOWN (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	.76		
S (session)	3	.52	1.75	ns
SSw	57	.30		
T (trial)	5	4.03	7.91	.001
TSw	95	.51		
S X T	15	.64	2.31	.004
STSw	285	.28		

TABLE 21

ANOVA Table for JUMP (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	19	115.62		
S (session)	3	209.72	6.66	.001
SSw	57	31.50		
T (trial)	5	71.23	5.61	.001
TSw	95	12.70		
S X T	15	21.87	3.37	.001
STSw	285	6.49		

TABLE 22

ANOVA Table for GNAW (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
Sw (subject)	19	764.05		
S (session)	3	423.83	6.04	.001
SSw	57	70.15		
T (trial)	5	423.98	6.28	.001
TSw	95	67.55		
S X T	15	37.35	2.83	.001
STSw	285	13.19		

TABLE 23

ANOVA Table for NOD (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
Sw (subject)	19	99.50		
S (session)	3	1329.67	16.72	.001
SSw	57	79.52		
T (trial)	5	261.91	10.82	.001
TSw	95	24.22		
S X T	15	39.12	2.21	.006
STSw	285	17.74		

TABLE 24

ANOVA Table for GROOM (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	8	34.07		
S (session)	3	80.83	5.67	.004
SSw	24	14.27		
T (trial)	5	30.04	3.38	.012
TSw	40	8.90		
S X T	15	8.88	1.06	ns
STSw	120	8.39		

TABLE 25

ANOVA Table for INACTIVE (Event Count)

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
Sw (subject)	8	17.26		
S (session)	3	13.15	5.57	.005
SSw	24	2.36		
T (trial)	5	27.97	3.95	.001
TSw	40	3.12		
S X T	15	1.94	1.12	ns
STSw	120	1.74		

TABLE 26

Drug Group Means(SEM) (Total Time)

Behavior	DRUG	
	Apomorphine	Saline
Locomote	.166(.005)	.045(.004)
Rear	.116(.001)	.045(.004)
Sniff	.571(.001)	.555(.002)
Gnaw	.082(.012)	.000
Nod	.045(.007)	.000
Headdown	.001(.003)	.000
Jump	.007(.003)	.000
Groom	.000	.119(.010)
Inactive	.000	.229(.025)

TABLE 27

Drug Group Means(SEM) (Event Duration)

Behavior	DRUG	
	Apomorphine	Saline
Locomote	7.24(.12)	3.33(.17)
Rear	4.01(.75)	3.25(.18)
Sniff	13.32(.19)	12.74(.36)
Gnaw	3.10(.05)	1.00
Nod	2.78(.17)	1.00
Headdown	1.16(.03)	1.00
Jump	1.49(.07)	1.00
Groom	1.00	5.25(.29)
Inactive	1.00	5.68(.48)

TABLE 28

Drug Group Means(SEM) (Event Count)

Behavior	DRUG	
	Apomorphine	Saline
Locomote	45.5(1.6)	9.7(.9)
Rear	3.5(1.0)	4.9(.7)
Sniff	43.7(1.1)	18.4(.7)
Gnaw	3.5(.5)	.0
Nod	3.2(1.0)	.0
Headdown	.1(.5)	.0
Jump	1.6(2.2)	.0
Groom	.0	3.5(.2)
Inactive	.0	1.4(.1)

TABLE 29

Session Means(SEM) of LOCOMOTE, REAR and SNIFF
(Total Time)

LOCOMOTE:

Session	DRUG	
	Apomorphine	Saline
1	.148(.007)	.083(.008)
2	.174(.009)	.044(.007)
3	.177(.014)	.029(.006)
4	.162(.012)	.023(.007)

REAR:

Session	DRUG	
	Apomorphine	Saline
1	.047(.012)	.088(.009)
2	.082(.015)	.044(.008)
3	.136(.022)	.029(.006)
4	.197(.030)	.019(.006)

SNIFF:

Session	DRUG	
	Apomorphine	Saline
1	.503(.024)	.573(.027)
2	.607(.021)	.593(.038)
3	.603(.022)	.555(.044)
4	.571(.029)	.498(.050)

TABLE 30

Session Means(SEM) of GNAW, NOD, HEADDOWN, JUMP
GROOM and INACTIVE (Total Time)

Session	Apomorphine	
	GNAW	NOD
1	.155(.026)	.123(.017)
2	.084(.021)	.040(.007)
3	.060(.013)	.009(.002)
4	.028(.012)	.007(.002)

Session	Apomorphine	
	HEADDOWN	JUMP
1	.001(.001)	.001(.001)
2	.000	.000
3	.001(.001)	.008(.002)
4	.000	.011(.002)

Session	Saline	
	GROOM	INACTIVE
1	.136(.017)	.112(.038)
2	.131(.021)	.170(.043)
3	.115(.019)	.270(.054)
4	.093(.020)	.364(.063)

TABLE 31

Session Means(SEM) of LOCOMOTE, REAR and SNIFF
(Event Duration)

LOCOMOTE:

Session	DRUG	
	Apomorphine	Saline
1	7.21(.18)	5.08(.33)
2	7.72(.21)	3.34(.33)
3	7.60(.25)	2.67(.28)
4	6.45(.29)	2.21(.31)

REAR:

Session	DRUG	
	Apomorphine	Saline
1	2.49(.32)	5.15(.34)
2	3.53(.40)	3.27(.35)
3	4.70(.49)	2.59(.29)
4	5.30(.63)	1.99(.29)

SNIFF:

Session	DRUG	
	Apomorphine	Saline
1	12.94(.37)	13.95(.50)
2	14.54(.28)	13.57(.56)
3	14.01(.34)	12.85(.81)
4	11.79(.48)	10.59(.95)

TABLE 32

Session Means(SEM) of GNAW, NOD, HEADDOWN, JUMP,
GROOM and INACTIVE (Event Duration)

Apomorphine		
Session	GNAW	NOD
1	4.63(.51)	5.28(.42)
2	3.15(.42)	2.57(.24)
3	2.34(.34)	1.67(.12)
4	2.11(.28)	1.61(.11)

Apomorphine		
Session	HEADDOWN	JUMP
1	1.09(.06)	1.06(.02)
2	1.05(.06)	1.20(.04)
3	1.13(.04)	1.85(.14)
4	1.36(.01)	1.94(.15)

Saline		
Session	GROOM	INACTIVE
1	6.24(.46)	3.93(.74)
2	5.60(.55)	5.10(.87)
3	4.94(.55)	6.74(.99)
4	4.20(.80)	7.46(1.14)

TABLE 33

Session Means(SEM) of LOCOMOTE, REAR and SNIFF
(Event Count)

LOCOMOTE:

Session	DRUG	
	Apomorphine	Saline
1	32.7(1.6)	19.7(2.1)
2	47.3(2.9)	9.0(1.5)
3	51.3(3.2)	5.8(1.2)
4	50.9(4.0)	4.2(1.4)

REAR:

Session	DRUG	
	Apomorphine	Saline
1	2.0(.5)	9.7(1.1)
2	3.6(.7)	4.6(.9)
3	3.8(.6)	3.1(.7)
4	4.5(.6)	2.1(.8)

SNIFF:

Session	DRUG	
	Apomorphine	Saline
1	38.9(1.7)	31.7(2.2)
2	46.9(1.7)	17.8(1.7)
3	46.4(2.1)	13.9(1.6)
4	42.8(2.3)	10.3(1.8)

TABLE 34

Session Means(SEM) of GNAW, NOD, HEADDOWN, JUMP,
GROOM and INACTIVE (Event Count)

Session	Apomorphine	
	GNAW	NOD
1	5.9(.9)	8.0(.9)
2	4.0(.9)	3.1(.5)
3	2.7(.6)	1.0(.2)
4	1.4(.4)	.8(.2)

Session	Apomorphine	
	HEADDOWN	JUMP
1	.1(.1)	.2(.1)
2	.1(.1)	.8(.2)
3	.2(.1)	2.5(.6)
4	.1(.1)	3.0(.5)

Session	Saline	
	GROOM	INACTIVE
1	5.1(.5)	.7(.2)
2	3.6(.5)	1.3(.3)
3	2.7(.5)	1.7(.3)
4	2.4(.5)	1.8(.3)

TABLE 35

Trial Means(SEM) of LOCOMOTE (Total Time)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	.184(.019)	.178(.015)
2	.194(.019)	.094(.016)
3	.164(.021)	.094(.009)
4	.136(.014)	.048(.020)
5	.115(.013)	.052(.015)
6	.093(.012)	.032(.010)
7	.251(.026)	.098(.021)
8	.224(.024)	.066(.016)
9	.188(.017)	.022(.011)
10	.173(.015)	.032(.017)
11	.127(.017)	.022(.011)
12	.081(.012)	.022(.007)
13	.288(.031)	.077(.016)
14	.229(.027)	.032(.012)
15	.173(.018)	.026(.015)
16	.151(.018)	.028(.015)
17	.122(.014)	.012(.008)
18	.100(.012)	.002(.002)
19	.221(.032)	.082(.020)
20	.226(.029)	.012(.011)
21	.161(.021)	.021(.013)
22	.146(.021)	.003(.003)
23	.127(.015)	.009(.005)
24	.093(.012)	.009(.004)

TABLE 36

Trial Means(SEM) of REAR (Total Time)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	.056(.030)	.130(.013)
2	.062(.036)	.124(.021)
3	.063(.037)	.098(.024)
4	.046(.030)	.069(.022)
5	.035(.026)	.061(.021)
6	.022(.015)	.044(.019)
7	.113(.041)	.117(.024)
8	.111(.042)	.052(.017)
9	.118(.051)	.032(.017)
10	.057(.026)	.030(.018)
11	.057(.030)	.031(.009)
12	.031(.018)	.023(.006)
13	.158(.053)	.090(.024)
14	.146(.051)	.028(.013)
15	.149(.058)	.017(.009)
16	.153(.058)	.019(.011)
17	.088(.052)	.013(.011)
18	.124(.051)	.004(.003)
19	.203(.058)	.078(.022)
20	.169(.058)	.007(.004)
21	.191(.059)	.019(.009)
22	.210(.067)	.000
23	.227(.071)	.007(.004)
24	.181(.064)	.002(.001)

TABLE 37

Trial Means(SEM) of SNIFF (Total Time)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	.683(.030)	.620(.023)
2	.601(.039)	.618(.053)
3	.466(.058)	.679(.026)
4	.407(.066)	.472(.097)
5	.408(.066)	.562(.075)
6	.452(.061)	.484(.082)
7	.615(.043)	.684(.044)
8	.620(.044)	.688(.072)
9	.577(.055)	.647(.090)
10	.557(.057)	.490(.094)
11	.553(.058)	.463(.100)
12	.721(.050)	.583(.060)
13	.521(.048)	.740(.039)
14	.596(.048)	.642(.091)
15	.620(.052)	.642(.093)
16	.574(.058)	.548(.121)
17	.653(.056)	.467(.136)
18	.651(.058)	.293(.119)
19	.532(.058)	.718(.047)
20	.578(.056)	.757(.039)
21	.594(.055)	.559(.106)
22	.551(.064)	.338(.120)
23	.532(.065)	.353(.125)
24	.638(.059)	.261(.064)

TABLE 38

Trial Means(SEM) of GNAW, NOD, HEADDOWN and JUMP (Total Time) (collapsed across sessions) - APOMORPHINE

Trial	Behavior			
	GNAW	NOD	HEADDOWN	JUMP
1	.024(.019)	.034(.024)	.001(.001)	.000
2	.052(.029)	.084(.024)	.000	.008(.008)
3	.164(.059)	.109(.036)	.001(.002)	.000
4	.241(.074)	.149(.049)	.000	.000
5	.225(.083)	.170(.051)	.000	.000
6	.222(.078)	.189(.049)	.000	.000
7	.002(.000)	.003(.002)	.002(.002)	.001(.001)
8	.008(.006)	.023(.013)	.000	.019(.016)
9	.087(.042)	.015(.010)	.000	.001(.001)
10	.156(.062)	.048(.025)	.000	.000
11	.163(.065)	.089(.004)	.000	.017(.000)
12	.089(.044)	.062(.006)	.000	.000
13	.008(.008)	.000	.005(.002)	.024(.012)
14	.007(.006)	.000	.000	.009(.004)
15	.038(.022)	.003(.002)	.000	.005(.002)
16	.100(.037)	.013(.005)	.000	.005(.003)
17	.117(.043)	.020(.008)	.000	.003(.001)
18	.087(.040)	.016(.006)	.000	.001(.001)
19	.000	.000	.001(.001)	.024(.010)
20	.001(.001)	.000	.000	.011(.005)
21	.022(.012)	.002(.002)	.000	.008(.004)
22	.031(.017)	.007(.004)	.000	.011(.004)
23	.059(.029)	.026(.010)	.001(.001)	.003(.002)
24	.052(.027)	.003(.004)	.000	.006(.002)

TABLE 39

Trial Means(SEM) of GROOM and INACTIVE (Total Time)
(collapsed across sessions) - SALINE

Trial	Behavior	
	GROOM	INACTIVE
1	.070(.025)	.000
2	.097(.022)	.063(.063)
3	.129(.033)	.000
4	.194(.061)	.217(.143)
5	.139(.054)	.141(.097)
6	.186(.046)	.250(.130)
7	.069(.027)	.032(.032)
8	.157(.043)	.037(.037)
9	.191(.053)	.107(.104)
10	.129(.065)	.283(.133)
11	.089(.037)	.367(.142)
12	.149(.060)	.197(.079)
13	.093(.033)	.000
14	.174(.054)	.122(.106)
15	.213(.044)	.102(.091)
16	.087(.054)	.317(.125)
17	.049(.040)	.456(.150)
18	.074(.041)	.621(.150)
19	.110(.050)	.008(.007)
20	.139(.039)	.086(.050)
21	.110(.049)	.287(.126)
22	.079(.039)	.577(.144)
23	.029(.022)	.599(.141)
24	.092(.040)	.631(.098)

TABLE 40

Trial Means(SEM) of LOCOMOTE (Event Duration)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	8.12(.41)	8.01(.37)
2	8.33(.42)	5.59(.64)
3	7.52(.47)	5.83(.26)
4	7.00(.37)	3.95(.60)
5	6.47(.37)	3.96(.74)
6	5.82(.40)	3.11(.47)
7	9.41(.50)	5.59(.81)
8	8.87(.50)	4.46(.72)
9	8.18(.38)	2.49(.62)
10	7.90(.36)	2.62(.79)
11	6.55(.46)	2.25(.65)
12	5.39(.38)	2.63(.49)
13	10.00(.59)	4.91(.70)
14	8.83(.63)	3.08(.64)
15	7.50(.57)	2.41(.74)
16	7.02(.54)	2.53(.70)
17	6.41(.46)	1.91(.40)
18	5.85(.40)	1.20(.20)
19	7.76(.76)	4.78(.79)
20	7.80(.79)	1.63(.56)
21	6.65(.65)	2.19(.65)
22	6.00(.70)	1.36(.24)
23	5.74(.60)	1.63(.37)
24	4.73(.51)	1.68(.33)

TABLE 41

Trial Means(SEM) of REAR (Event Duration)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	2.66(.86)	6.85(.37)
2	2.95(.90)	6.43(.77)
3	2.89(1.00)	5.67(.57)
4	2.43(.80)	4.40(.85)
5	2.10(.72)	4.09(.89)
6	1.94(.54)	3.45(.85)
7	4.40(1.11)	6.04(.86)
8	4.39(1.09)	3.96(.74)
9	4.25(1.18)	2.73(.77)
10	3.18(.80)	2.35(.81)
11	2.96(.84)	1.81(.48)
12	2.01(.55)	2.74(.44)
13	5.25(1.42)	5.10(.94)
14	5.26(1.15)	2.83(.61)
15	4.98(1.22)	2.16(.54)
16	4.89(1.26)	2.26(.60)
17	3.22(1.06)	1.74(.56)
18	4.31(1.16)	1.48(.32)
19	5.74(1.30)	4.48(.85)
20	5.13(1.21)	1.53(.33)
21	5.55(1.27)	2.00(.62)
22	5.29(1.36)	1.09(.06)
23	5.44(1.42)	1.41(.29)
24	4.66(1.30)	1.41(.19)

TABLE 42

Trial Means(SEM) of SNIFF (Event Duration)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	15.69(.36)	14.95(.26)
2	14.65(.50)	14.80(.72)
3	12.41(.79)	15.66(.30)
4	11.37(1.02)	11.91(1.91)
5	11.35(1.05)	13.82(1.24)
6	12.15(.96)	12.57(1.48)
7	14.75(.58)	15.65(.53)
8	14.84(.56)	15.56(.91)
9	14.17(.74)	14.76(1.40)
10	13.83(.80)	11.45(1.86)
11	13.81(.78)	10.79(2.07)
12	15.83(.61)	13.18(1.40)
13	13.41(.75)	16.29(.44)
14	14.45(.68)	14.68(1.46)
15	14.02(1.02)	15.00(.97)
16	13.34(1.07)	12.90(2.00)
17	14.36(1.05)	10.74(2.58)
18	14.58(.96)	7.49(2.50)
19	11.85(1.19)	15.03(1.48)
20	12.42(1.30)	15.08(1.45)
21	12.53(1.26)	12.24(2.01)
22	11.37(1.38)	7.01(2.44)
23	11.05(1.38)	7.08(2.54)
24	11.49(1.44)	7.10(1.76)

TABLE 43

Trial Means(SEM) for GNAW, NOD and HEADDOWN (Event Count) (collapsed across sessions) - APOMORPHINE

Trial	Behavior		
	GNAW	NOD	HEADDOWN
1	1.88(.58)	2.40(.69)	1.31(.16)
2	2.45(.59)	4.80(.82)	1.08(.06)
3	5.45(1.34)	3.86(.96)	1.14(.13)
4	6.45(1.53)	5.85(1.12)	1.00(.00)
5	5.59(1.56)	6.83(1.20)	1.00(.00)
6	5.98(1.56)	6.96(1.09)	1.04(.04)
7	1.17(.16)	1.10(.07)	1.27(.16)
8	1.52(.32)	1.78(.45)	1.04(.04)
9	3.52(1.04)	1.59(.23)	1.00(.00)
10	4.61(1.38)	2.61(.60)	1.00(.00)
11	4.75(1.41)	3.99(.89)	1.00(.00)
12	3.32(1.10)	4.37(.60)	1.01(.01)
13	1.06(.04)	1.00(.00)	1.57(.19)
14	1.31(.30)	1.11(.07)	1.05(.03)
15	2.01(.63)	1.37(.20)	1.07(.05)
16	3.48(.99)	2.07(.34)	1.04(.04)
17	3.83(1.08)	2.18(.29)	1.04(.04)
18	3.36(1.03)	2.27(.38)	1.04(.04)
19	1.24(.13)	1.24(.24)	1.33(.14)
20	1.35(.17)	1.26(.13)	1.24(.13)
21	2.14(.50)	1.48(.21)	1.24(.13)
22	2.33(.59)	1.72(.27)	1.37(.17)
23	2.84(.79)	2.02(.35)	1.49(.19)
24	2.74(.75)	1.93(.33)	1.52(.21)

TABLE 44

Trial Means(SEM) of GROOM and INACTIVE (Event Duration)
(collapsed across sessions) - SALINE

Trial	Behavior	
	GROOM	INACTIVE
1	4.54(.86)	1.00(.00)
2	5.55(.81)	2.48(1.48)
3	6.33(.95)	1.09(.09)
4	7.43(1.40)	4.95(2.61)
5	6.33(1.18)	4.40(2.02)
6	7.28(1.37)	6.44(2.48)
7	4.30(.99)	2.02(1.02)
8	6.88(1.13)	2.00(1.10)
9	7.39(1.40)	3.01(1.92)
10	5.17(1.41)	7.33(2.52)
11	4.15(1.24)	9.02(2.58)
12	5.72(1.43)	6.91(1.75)
13	4.20(.99)	1.00(.00)
14	6.78(1.49)	3.66(2.00)
15	8.20(1.13)	3.51(1.79)
16	3.84(1.48)	8.43(2.37)
17	2.85(1.14)	10.70(2.55)
18	3.79(1.31)	13.22(2.53)
19	4.69(1.45)	1.56(.41)
20	5.72(1.27)	3.50(1.51)
21	4.50(1.44)	6.70(2.45)
22	3.83(1.17)	10.46(2.68)
23	2.31(.84)	10.64(2.75)
24	4.16(1.23)	11.89(2.27)

TABLE 45

Trial Means(SEM) for LOCOMOTE (Event Count)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	39.1(3.4)	46.8(3.9)
2	40.9(4.1)	20.7(3.3)
3	34.2(4.1)	20.2(2.4)
4	30.4(3.7)	10.6(2.3)
5	30.0(3.9)	13.4(3.6)
6	21.5(2.8)	6.8(2.2)
7	60.2(7.2)	18.6(4.2)
8	56.1(7.3)	13.4(3.2)
9	53.6(8.0)	7.2(4.4)
10	49.0(4.8)	6.0(3.2)
11	41.8(8.3)	4.7(2.3)
12	23.5(3.0)	4.1(1.1)
13	80.7(10.6)	14.7(3.5)
14	65.5(8.2)	8.2(3.3)
15	50.2(5.8)	3.8(2.6)
16	53.5(5.0)	5.4(3.0)
17	37.0(4.5)	2.3(1.6)
18	30.8(3.8)	.2(.2)
19	65.8(9.3)	16.2(4.4)
20	78.1(11.0)	3.0(2.6)
21	7.8(6.0)	3.8(2.6)
22	9.9(6.3)	.0
23	40.8(5.0)	1.1(.6)
24	30.0(3.6)	1.1(.6)

TABLE 46

Trial Means(SEM) for REAR (Event Count)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	2.5(1.4)	21.0(2.3)
2	3.1(1.6)	12.7(2.2)
3	2.8(1.3)	9.2(1.6)
4	2.2(1.2)	5.7(1.6)
5	1.0(.9)	4.9(1.7)
6	.9(.6)	5.0(1.9)
7	6.5(3.2)	12.8(2.9)
8	5.7(2.1)	2.4(1.5)
9	3.8(1.5)	1.7(1.5)
10	3.3(1.3)	3.6(2.1)
11	1.7(.6)	1.1(.7)
12	.8(.4)	1.9(.6)
13	7.1(2.1)	10.0(2.7)
14	6.5(2.2)	2.8(1.2)
15	3.6(1.3)	2.4(1.5)
16	2.8(1.1)	2.1(1.1)
17	1.5(1.0)	1.0(.7)
18	1.6(.6)	.3(.2)
19	6.7(1.4)	9.2(2.8)
20	5.8(1.5)	.7(.4)
21	4.7(1.4)	1.8(1.1)
22	4.3(1.1)	.0
23	3.1(.8)	.8(.5)
24	2.8(.9)	.2(.1)

TABLE 47

Trial Means(SEM) of SNIFF (Event Count)
(collapsed across sessions)

Trial	DRUG	
	Apomorphine	Saline
1	50.1(3.3)	54.0(4.0)
2	48.2(3.5)	36.1(4.0)
3	38.8(3.7)	34.8(2.4)
4	31.9(4.4)	22.1(4.8)
5	31.2(4.1)	23.1(4.7)
6	32.7(3.1)	19.3(4.1)
7	51.6(4.0)	20.7(4.3)
8	52.5(4.5)	24.8(3.6)
9	50.4(4.3)	13.4(2.6)
10	50.4(4.6)	15.6(4.8)
11	43.5(4.1)	9.8(2.8)
12	33.0(3.0)	13.7(1.8)
13	56.5(6.0)	25.6(4.5)
14	52.6(5.6)	22.9(9.1)
15	47.9(5.4)	13.2(3.3)
16	41.7(3.9)	11.0(3.5)
17	41.4(4.2)	7.1(3.1)
18	38.2(4.0)	3.9(1.7)
19	44.3(4.4)	25.9(4.4)
20	51.2(4.3)	11.4(3.4)
21	44.6(5.0)	11.7(4.2)
22	41.9(5.5)	3.8(1.2)
23	39.7(4.9)	4.0(1.6)
24	35.4(3.8)	5.1(1.5)

TABLE 48

Trial Means(SEM) of GNAW, NOD, HEADDOWN and JUMP
(Event Count) (collapsed across sessions) - APOMORPHINE

Trial	Behavior			
	GNAW	NOD	HEADDOWN	JUMP
1	1.2(1.0)	1.9(1.0)	.4(.2)	.2(.1)
2	1.6(.7)	7.2(1.7)	.1(.1)	.1(.1)
3	8.0(2.7)	7.8(2.0)	.3(.3)	.2(.2)
4	9.1(2.8)	10.0(2.6)	.0	.3(.2)
5	7.2(2.5)	10.7(2.5)	.0	.9(.1)
6	8.1(2.6)	10.3(2.0)	.1(.1)	.2(.1)
7	.4(.3)	.2(.2)	.3(.1)	.9(.5)
8	.7(.4)	1.4(.8)	.1(.1)	1.3(.1)
9	5.6(2.7)	1.2(.5)	.0	1.5(.6)
10	6.5(3.0)	3.7(1.3)	.0	.5(.2)
11	6.7(2.8)	6.5(2.2)	.0	.5(.2)
12	4.0(2.0)	5.5(1.2)	.1(.1)	.2(.1)
13	.2(.1)	.0	1.2(.4)	6.0(2.8)
14	.3(.3)	.3(.2)	.1(.1)	3.0(1.1)
15	1.3(.8)	.4(.3)	.1(.1)	2.0(.9)
16	4.8(2.0)	1.3(.4)	.0	2.1(.8)
17	5.1(2.1)	1.9(.6)	.0	1.0(.5)
18	4.7(2.0)	2.5(.9)	.0	.8(.4)
19	.2(.1)	.0	.6(.3)	6.2(1.9)
20	.3(.3)	.1(.1)	.0	2.9(1.0)
21	1.7(.9)	.5(.2)	.0	2.3(.8)
22	2.1(1.1)	.8(.4)	.0	3.2(.9)
23	2.3(1.1)	2.0(.7)	.2(.2)	2.1(.7)
24	2.3(1.2)	1.5(.7)	.0	1.2(.4)

TABLE 49

Trial Means(SEM) of GROOM and INACTIVE (Event Count) (collapsed across sessions) - SALINE

Trial	Behavior	
	GROOM	INACTIVE
1	3.0(.8)	.0
2	4.1(.8)	.6(.6)
3	6.8(1.5)	.1(.1)
4	5.2(1.1)	.8(.5)
5	5.8(1.2)	1.1(.6)
6	5.9(1.3)	1.7(.8)
7	2.7(1.1)	.7(.7)
8	4.9(1.1)	.2(.2)
9	4.6(1.0)	.8(.5)
10	3.6(1.7)	1.9(.7)
11	2.3(.8)	2.8(.8)
12	3.7(1.0)	1.7(.4)
13	2.2(.6)	.0
14	4.4(1.4)	.8(.5)
15	4.9(1.4)	1.0(.6)
16	1.7(.9)	2.3(.8)
17	1.3(1.0)	2.9(.7)
18	1.7(.8)	3.0(.6)
19	3.0(1.0)	.3(.3)
20	3.1(1.2)	1.0(.6)
21	3.6(1.2)	1.9(.7)
22	1.4(.4)	2.7(.5)
23	1.0(.5)	2.7(.5)
24	2.3(.7)	2.3(.4)

TABLE 50

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of LOCOMOTE for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		61	63	60		
2	61		77	65		
3	63	77		91	58	49
4	60	65	91		65	60
5			58	65		68
6			49		68	
7			46		51	
8		60	54			
9	53	55	67			
10			46		59	70
11						50
12						
13	48		60	52	58	56
14			56	48		50
15	51		54		52	49
16						
17					46	
18	46					
19	49		56			
20			51			
21			58	44	45	50
22			57	57	66	76
23					47	54
24						

$\bar{r} = \frac{XX}{r}$ $p < .05$
 $\bar{r} = \frac{XX}{r}$ $p < .01$

TABLE 50, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE

	TRIAL					
	7	8	9	10	11	12
1			<u>53</u>			
2		60	<u>55</u>			
3	<u>46</u>	<u>54</u>	<u>67</u>	<u>46</u>		
4			<u>55</u>			
5			<u>51</u>	59		
6				70	<u>56</u>	<u>50</u>
7		86	62	<u>47</u>		
8	86		79	<u>64</u>		
9	62	79		71		
10	<u>47</u>	64	<u>71</u>		<u>56</u>	<u>54</u>
11				<u>56</u>		<u>75</u>
12				<u>54</u>	75	
13	61	58	71	<u>49</u>		
14	70	71	76	<u>59</u>		
15	61	66	80	59		
16			<u>44</u>			
17			<u>52</u>			
18						
19	<u>47</u>		<u>45</u>			
20	<u>67</u>	61	<u>61</u>			
21	<u>47</u>	<u>54</u>	<u>71</u>	<u>50</u>		
22		<u>49</u>	66	<u>64</u>	<u>45</u>	
23			<u>50</u>	<u>46</u>		
24						

TABLE 50, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE

	TRIAL					
	13	14	15	16	17	18
1	<u>48</u>		<u>51</u>			<u>46</u>
2						
3	<u>60</u>	<u>56</u>	<u>54</u>			
4	<u>52</u>	<u>48</u>				
5	<u>58</u>				<u>46</u>	
6	<u>56</u>	<u>50</u>	<u>49</u>			
7	<u>61</u>	<u>70</u>	<u>61</u>			
8	<u>58</u>	<u>71</u>	<u>66</u>			
9	<u>71</u>	<u>76</u>	<u>80</u>	<u>44</u>	<u>52</u>	
10	<u>49</u>	<u>59</u>	<u>59</u>			
11						
12						
13		<u>85</u>	<u>87</u>	<u>64</u>	<u>59</u>	
14	<u>85</u>		<u>93</u>	<u>62</u>	<u>56</u>	<u>54</u>
15	<u>87</u>	<u>93</u>		<u>70</u>	<u>73</u>	<u>62</u>
16	<u>64</u>	<u>62</u>	<u>70</u>		<u>89</u>	<u>78</u>
17	<u>59</u>	<u>56</u>	<u>73</u>	<u>89</u>		
18		<u>54</u>	<u>52</u>	<u>78</u>		
19	<u>73</u>	<u>68</u>	<u>57</u>			
20	<u>79</u>	<u>85</u>	<u>76</u>			
21	<u>73</u>	<u>81</u>	<u>77</u>			
22	<u>77</u>	<u>70</u>	<u>57</u>	<u>60</u>	<u>64</u>	<u>48</u>
23	<u>58</u>	<u>63</u>	<u>73</u>	<u>79</u>	<u>77</u>	<u>68</u>
24				<u>56</u>	<u>67</u>	<u>63</u>

TABLE 50, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE

TRIAL						
	19	20	21	22	23	24
1	<u>49</u>					
2						
3	<u>56</u>	<u>51</u>	58	57		
4			<u>44</u>	57		
5			<u>45</u>	66	<u>47</u>	
6			<u>50</u>	76	<u>54</u>	
7	<u>47</u>	67	<u>47</u>			
8		61	<u>54</u>	<u>49</u>		
9	<u>45</u>	61	<u>71</u>	<u>66</u>	<u>50</u>	
10			<u>50</u>	<u>64</u>	<u>46</u>	
11				<u>45</u>		
12						
13	73	79	73	77	58	
14	<u>58</u>	85	81	70	63	
15	<u>57</u>	76	77	57	73	
16				60	79	<u>56</u>
17				<u>64</u>	77	<u>67</u>
18				<u>48</u>	68	63
19		81	77	<u>47</u>		
20	81		90	<u>61</u>	<u>44</u>	
21	77	90		71	<u>60</u>	
22	<u>47</u>	61	71	99	80	<u>54</u>
23		<u>44</u>	60	80		<u>67</u>
24				<u>54</u>	67	

TABLE 51

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of LOCOMOTE for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

$\bar{r} = \text{XX}$: $p < .05$

$\bar{r} = \text{XX}$: $p < .01$

TABLE 51, continued

(Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1						
2						
3						
4						
5						
6						
7						
8						
9						
10					99	99
11				99		99
12				99	99	
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

TABLE 51, continued

(Trials 1-24 by Trials 13-18)

SALINE						
TRIAL						
	13	14	15	16	17	18
1						
2		<u>76</u>				
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19	83					
20				84	<u>80</u>	
21						
22						
23		<u>72</u>				
24						

TABLE 51, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24
1						
2				<u>73</u>	<u>80</u>	
3						
4						
5			<u>73</u>			
6						
7						
8						
9						
10						
11						
12						
13	83					
14					<u>72</u>	
15						
16		84				
17		<u>80</u>				
18						
19						
20						
21						
22						
23				95	95	
24						

TABLE 52

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
of REAR for the Dependent Measure Total Time
(Trials 1-24 by Trials 1-6)

APOMORPHINE

	TRIAL					
	1	2	3	4	5	6
1		94	92	90	75	84
2	94		96	88	<u>51</u>	82
3	92	96		96	<u>64</u>	93
4	90	88	96		80	99
5	75	<u>51</u>	64	80		79
6	84	<u>82</u>	93	99	79	
7	64	62	<u>53</u>	<u>46</u>		
8						
9			<u>48</u>	<u>50</u>		<u>49</u>
10	68	68	<u>78</u>	<u>80</u>	60	<u>80</u>
11						
12						
13						
14						
15						
16						
17						
18			<u>43</u>			
19			<u>48</u>	<u>53</u>	<u>50</u>	<u>52</u>
20						
21						
22						
23						
24						

$\bar{r} = \overline{XX}$: $p < .05$

$\bar{r} = \overline{XX}$: $p < .01$

APOMORPHINE

TRIAL

	1	2	3	4	5	6
1		94	92	90	75	84
2	94		96	88	<u>51</u>	82
3	92	96		96	<u>64</u>	93
4	90	88	96		80	99
5	75	<u>51</u>	64	80		79
6	84	82	93	99	79	
7	64	62	<u>53</u>	<u>46</u>		
8						
9			<u>48</u>	<u>50</u>		<u>49</u>
0	68	68	<u>78</u>	<u>80</u>	60	<u>80</u>
1						
2						
3						
4						
5						
6						
7						
8			<u>43</u>			
9			<u>48</u>	<u>53</u>	<u>50</u>	<u>52</u>
0						
1						
2						
3						
4						

=XX: p < .05
 =XX: p < .01

TABLE 52, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3						<u>43</u>
4						
5						
6						
7	<u>53</u>	<u>51</u>	<u>46</u>	69	<u>53</u>	<u>53</u>
8	<u>83</u>	<u>83</u>	<u>86</u>	93	<u>73</u>	<u>69</u>
9	81	82	92	90	73	75
10	57	63	70	83	78	83
11	74	72	84	75	59	65
12	59	<u>53</u>	60	<u>47</u>		
13			91	87	69	71
14			94	91	79	77
15	91	94		93	84	83
16	87	91	93		90	86
17	69	79	84	90		92
18	71	77	83	86	92	
19	83	84	86	87	73	80
20	60	91	94	96	88	78
21	85	88	94	93	79	74
22	70	67	72	78	59	55
23	75	74	82	85	66	63
24	76	78	87	85	80	86

TABLE 52, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3	<u>48</u>					
4	<u>53</u>					
5	<u>50</u>					
6	<u>52</u>					
7	59		59	64	62	
8	76	84	94	92	94	77
9	87	87	92	76	87	87
10	83	58	69	<u>47</u>	60	75
11	73	82	82	<u>72</u>	81	86
12	60	60	59	<u>48</u>	57	<u>47</u>
13	83	91	85	70	75	76
14	84	94	88	67	74	78
15	86	96	94	72	82	87
16	87	88	93	78	85	85
17	73	78	79	59	66	80
18	80	73	74	<u>55</u>	63	86
19		84	86	60	73	86
20	84		95	76	84	75
21	86	95		81	93	84
22	60	76	81		97	
23	73	84	93	97		
24	86	75	84			

TABLE 53

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of REAR for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

	SALINE					
	TRIAL					
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8		77				
9						
10						
11						
12						
13		75				
14						
15						
16						
17						
18						
19						
20						
21						
22				80	70	
23						
24						

$\underline{r=XX}$: $p < .05$
 $\underline{r=XX}$: $p < .01$

TABLE 53, continued

(Trials 1-24 by Trials 7-12)

SALINE						
TRIAL						
	7	8	9	10	11	12
1						
2		<u>77</u>				
3						
4						
5						
6						
7						
8						
9						
10					99	99
11				99		99
12				99	99	
13		<u>73</u>				
14						
15						
16					83	83
17						
18						
19	<u>69</u>					
20						
21						
22						
23		<u>70</u>	81			
24			87			

TABLE 53, continued

(Trials 1-24 by Trials 13-18)

	SALINE					
	TRIAL					
	13	14	15	16	17	18
1						
2	<u>75</u>					
3						
4						
5						
6						
7						
8	<u>73</u>					
9						
10				83		
11				83		
12				83		
13						
14					92	
15						
16						<u>72</u>
17		92				
18				<u>72</u>		
19			<u>77</u>			
20		96			97	
21						
22						
23						
24						

TABLE 53, continued
(Trials 1-24 by Trials 19-24)

	SALINE					
	TRIAL					
	19	20	21	22	23	24
1						
2						
3					<u>80</u>	
4						
5			<u>70</u>			
6						
7	<u>69</u>					
8					<u>70</u>	
9					<u>81</u>	87
10						
11						
12						
13						
14		96				
15	<u>77</u>					
16						
17		97				
18						
19						
20						
21						
22						
23						
24						

TABLE 54

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of SNIFF for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		80				
2	80		79	61	53	
3		79		92	85	66
4		61	92		90	74
5		53	85	90		77
6			66	74	77	
7	63	66	54			
8	80	84	66	50		
9	61	76	81	67	57	59
10		51	81	74	74	62
11		59	81	83	84	64
12		58	68	60	67	63
13	73	49				
14	74	51				
15	75	70	50			
16	48	64	66	56		62
17		50	61	50		54
18		57	65	54		55
19	68	52				
20	65	49				
21	73	66	40			
22	74	72	52			
23	73	73	56	46		49
24	61	64	49			

$\bar{r} = \text{XX}$: $p < .05$

$\bar{r} = \text{XX}$: $p < .01$

TABLE 54, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1	63	80	61			
2	66	84	76	<u>51</u>	59	58
3	<u>54</u>	66	81	81	81	68
4		<u>50</u>	67	74	83	60
5			57	74	84	67
6			59	62	64	63
7		79	65	59	<u>45</u>	
8	79		87	<u>46</u>	<u>50</u>	59
9	65	87		<u>67</u>	<u>68</u>	75
10	59	<u>46</u>	67		87	73
11	<u>45</u>	<u>50</u>	68	87		78
12		59	75	73	78	
13	59	66	62			
14	57	69	61			
15	58	84	75			
16	59	59	85	64	<u>56</u>	65
17	58	58	75	65	<u>48</u>	<u>51</u>
18	58	58	75	71	<u>55</u>	<u>53</u>
19	63	66	56			
20		66	57			
21	<u>56</u>	84	72			
22	<u>54</u>	85	76			59
23	<u>53</u>	85	81		<u>47</u>	59
24	<u>46</u>	74	71			

TABLE 54, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE

TRIAL						
	13	14	15	16	17	18
1	73	74	75	48		
2	<u>49</u>	<u>51</u>	70	<u>64</u>	50	57
3			<u>50</u>	66	<u>61</u>	65
4				<u>56</u>	<u>50</u>	<u>54</u>
5						
6				62	<u>54</u>	<u>55</u>
7	59	57	58	59	58	58
8	66	69	84	79	70	68
9	62	61	75	85	75	75
10				64	65	71
11				<u>56</u>	<u>48</u>	<u>55</u>
12				65	<u>51</u>	<u>53</u>
13		94	77	<u>50</u>		
14	94		89	61	48	
15	77	89		81	<u>68</u>	64
16	<u>50</u>	61	81		92	90
17		<u>48</u>	68	92		95
18			64	90	95	
19	87	89	78	<u>50</u>		
20	83	88	83	<u>49</u>		
21	72	80	92	<u>72</u>	56	
22	56	62	80	75	60	63
23	58	52	80	81	70	69
24			77	76	72	68

TABLE 54, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE

	TRIAL					
	19	20	21	22	23	24
1	68	65	73	74	73	61
2	<u>52</u>	<u>49</u>	66	72	73	64
3			<u>40</u>	<u>52</u>	<u>56</u>	<u>49</u>
4					<u>46</u>	
5						
6					<u>49</u>	
7	63		<u>56</u>	<u>54</u>	<u>53</u>	<u>46</u>
8	66	66	<u>84</u>	<u>85</u>	<u>85</u>	<u>74</u>
9	56	57	72	76	81	71
10						
11					<u>47</u>	
12				59	<u>59</u>	
13	87	83	72	56	58	
14	89	88	80	62	62	
15	78	83	92	80	80	77
16	<u>50</u>	<u>49</u>	72	75	81	76
17			56	66	70	72
18				63	69	68
19		93	81	<u>53</u>	<u>56</u>	
20	93		89	<u>63</u>	<u>64</u>	61
21	81	89		86	84	76
22	<u>53</u>	63	86		97	81
23	<u>56</u>	64	84	97		89
24		61	76	81	89	

TABLE 55

Trial By Trial Significant Correlation Coefficients ($\underline{r} \times 100$)
 of SNIFF for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1						
2				<u>.69</u>		
3						
4						
5						
6						
7						
8		<u>78</u>				
9		94		<u>70</u>		
10						
11						
12						
13						
14						
15						<u>67</u>
16						
17						
18						
19					<u>67</u>	
20						
21						
22						
23						
24					85	

$\underline{r} = \underline{XX}$: $p < .05$

$\underline{r} = \underline{XX}$: $p < .01$

TABLE 55, continued
 (Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1						
2		<u>78</u>	94			
3						
4			<u>70</u>			
5						
6						
7						
8			<u>71</u>			
9		<u>71</u>				
10					99	99
11				99		99
12				99	99	
13	<u>68</u>					
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

TABLE 55, continued

(Trials 1-24 by Trials 13-18)

SALINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6			<u>67</u>			
7	<u>68</u>					
8						
9						
10						
11						
12						
13						
14			<u>71</u>			
15		<u>71</u>				
16					<u>72</u>	
17				<u>72</u>		<u>76</u>
18					<u>76</u>	
19	<u>77</u>				<u>75</u>	
20						
21			83			
22						
23						
24						

TABLE 55, Continued

(Trials 1-24 by Trials 19-24)

	SALINE					
	TRIAL					
	19	20	21	22	23	24
1						
2						
3						
4						
5	-67					85
6						
7						
8						
9						
10						
11						
12						
13	27					
14						
15			83			
16						
17	-25					
18						
19		-73				
20	-73			75		70
21				69		
22		75	69		77	
23			77	94	94	71
24		70		71		

TABLE 56

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of GNAW for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1						
2				45	47	61
3				95	87	86
4		45	95		92	95
5		47	87	92		95
6		61	86	95	95	
7						
8			58	46	45	47
9			79	77	82	82
10			87	91	98	94
11			87	90	99	95
12		52	58	67	83	81
13						
14		80				44
15		72			46	45
16			62	69	81	82
17		49	62	69	84	83
18		50	58	69	82	84
19						
20	98					
21	68	56		54	71	64
22	76		57	58	58	51
23	44		61	64	67	65
24		61		45	59	66

$\bar{r} = \text{XX}$: $p < .05$
 $\bar{r} = \text{XX}$: $p < .01$

TABLE 56, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE					
TRIAL					
7	8	9	10	11	12
1					
2					<u>52</u>
3	58	79	87	87	<u>58</u>
4	<u>46</u>	77	91	90	67
5	<u>45</u>	82	98	99	<u>83</u>
6	<u>47</u>	82	94	95	81
7					
8		83	<u>56</u>	<u>51</u>	59
9	83		<u>87</u>	<u>86</u>	85
10	<u>56</u>	87		99	81
11	<u>51</u>	86	99		82
12	<u>59</u>	85	81	82	
13					
14					61
15					<u>64</u>
16	<u>45</u>	79	82	84	79
17	<u>53</u>	81	85	86	90
18		83	82	84	88
19					
20					
21		<u>48</u>	60	64	78
22		<u>52</u>	<u>53</u>	<u>55</u>	
23		<u>65</u>	<u>65</u>	<u>67</u>	<u>53</u>
24		<u>52</u>	59	63	<u>65</u>

TABLE 56, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2		80	72		<u>49</u>	<u>50</u>
3				62	<u>62</u>	<u>58</u>
4				69	69	69
5			<u>46</u>	81	84	82
6		<u>44</u>	<u>45</u>	82	83	84
7						
8				<u>50</u>	<u>53</u>	
9				79	81	83
10				82	85	82
11				84	86	84
12		61	64	79	70	88
13						
14			92	57	63	61
15		92		64	72	60
16		57	64		95	90
17		63	72	95		86
18		61	60	90	86	
19						
20						
21		60	73	58	67	71
22						<u>50</u>
23				67	<u>53</u>	<u>74</u>
24		77	65	76	<u>67</u>	87

TABLE 56, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1		98	68	76	<u>44</u>	
2			<u>56</u>			61
3				57	61	
4			<u>54</u>	58	64	<u>45</u>
5			71	58	67	<u>59</u>
6			64	<u>51</u>	65	66
7						
8						
9			<u>48</u>	<u>52</u>	65	<u>52</u>
10			60	<u>53</u>	65	<u>59</u>
11			64	<u>55</u>	67	63
12			78		<u>53</u>	65
13						
14			60			77
15			73			65
16			58		67	76
17			67		<u>53</u>	67
18			71	<u>50</u>	74	87
19						
20			71	79	<u>48</u>	
21		71		66	<u>63</u>	58
22		79	66		90	
23		<u>49</u>	63	90		59
24			58		59	

TABLE 57

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of NOD for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1			<u>53</u>	64	56	
2						
3	<u>53</u>			88	83	78
4	<u>64</u>	88			93	72
5	56	83	93			82
6		78	72	82		
7						
8						
9						
10						
11						
12						
13						
14						
15		<u>51</u>				
16						
17						
18					<u>-45</u>	<u>-47</u>
19						
20						
21						
22						
23						
24						

$\underline{r}=\underline{XX}$: p < .05
 $\underline{r}=\underline{XX}$: p < .01

TABLE 57, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3						
4						
5						
6						
7		66	93	75	68	
8	66		<u>51</u>			
9	93	<u>51</u>		79	82	
10	75		79		88	
11	68		82	88		
12						
13						
14						
15						
16						
17						
18		<u>47</u>				
19						
20						
21		66				
22						
23						
24						

TABLE 57, continued
(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2			<u>51</u>			
3						
4						
5						<u>-45</u>
6						<u>-47</u>
7						
8						<u>47</u>
9						
10						
11						
12						
13						
14			79			
15		79				65
16						
17						
18			65		o	
19						
20						
21			57			65
22						
23						
24						

TABLE 57, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5						
6						
7						
8			66			
9						
10						
11						
12						
13						
14						
15			57			
16						
17						
18			65			
19						
20						
21						
22						
23						
24				89		

TABLE 58

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of HEADDOWN for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19		99				
20						
21						
22						
23						
24						

$\underline{r=XX}$: $p < .05$

$\underline{r=XX}$: $p < .01$

NOTE: Trials 1-24 by Trials 7-12 - no significant correlations
 Trials 1-24 by Trials 13-18 - no significant correlations

TABLE 58, continued

(Trials 1-24 by Trials 19-24)

	APOMORPHINE					
	TRIAL					
	19	20	21	22	23	24
1						
2	99					
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

TABLE 59

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
of JUMP for the Dependent Measure Total Time
(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3						
4						
5						
6						
7		68			69	
8	68				99	
9						
10						
11	69	99				
12						
13	60	63			58	
14	65	80			77	
15	58	<u>57</u>			<u>50</u>	
16	<u>54</u>	70			66	
17		75			71	
18		61	61		<u>56</u>	
19	64	61			58	
20	74	93			93	
21	79	91			90	
22	<u>55</u>	<u>56</u>	<u>45</u>		<u>53</u>	
23	76	<u>54</u>			<u>52</u>	
24			<u>47</u>			

$\bar{r} = \text{XX}$: $p < .05$

$\bar{r} = \text{XX}$: $p < .01$

NOTE: Trials 1-24 by Trials 1-6 - no significant correlations

TABLE 59, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6						
7	60	65	58	<u>54</u>		
8	63	80	<u>57</u>	<u>70</u>	75	61
9						61
10						
11	58	77	<u>50</u>	66	71	<u>56</u>
12						
13		94	97	95	68	80
14	94		93	95	81	86
15	97	93		93	62	80
16	95	95	93		72	74
17	68	81	62	72		78
18	80	86	80	74	78	
19	66	57	70	<u>56</u>	63	81
20	63	82	62	<u>71</u>	70	61
21	66	81	63	75	64	50
22	67	77	73	58	62	85
23	84	85	83	87	<u>48</u>	57
24						62

TABLE 59, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5						
6						
7	64	74	79	<u>55</u>	76	
8	61	93	91	<u>56</u>	<u>54</u>	
9				<u>45</u>		<u>47</u>
10						
11	58	93	90	<u>53</u>	<u>52</u>	
12						
13	66	63	66	67	89	
14	57	82	81	77	85	
15	70	62	63	73	83	
16	<u>56</u>	71	75	58	87	
17	<u>63</u>	70	64	62	<u>48</u>	
18	81	61	<u>50</u>	85	<u>57</u>	62
19		73	64	98	63	77
20	73		97	70	66	
21	64	97		60	72	
22	98	70	60		63	82
23	63	66	72	63		
24	77			82		

TABLE 60, continued

-(Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1		84				
2						
3						
4				<u>75</u>	<u>74</u>	<u>72</u>
5						
6						
7						
8						
9						
10					99	99
11				99		99
12				99	99	
13						
14						
15						
16						
17						
18						
19	94					
20		<u>-74</u>				
21						
22				88	89	89
23				99	98	98
24						

TABLE 60, continued

(Trials 1-24 by Trials 13-18)

	SALINE					
	TRIAL					
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

78

84

TABLE 60, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24
1		-69				
2				-71		
3						
4				74	74	
5						
6						
7	94					
8		-74				
9						
10				88	99	
11				89	98	
12				89	98	
13						
14						
15						
16						
17						
18	84					
19						
20						
21						
22					89	76
23				89		
24					76	

TABLE 61

o Trial By Trial Significant Correlation Coefficients (\underline{r} x 100)
 of INACTIVE for the Dependent Measure Total Time
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1						
2				<u>67</u>	92	
3						
4		<u>67</u>				
5		92				
6						
7		99		<u>67</u>	92	
8		99		<u>67</u>	92	
9		99			92	
10				90		
11				<u>79</u>		
12						
13						
14						<u>69</u>
15						<u>75</u>
16						
17				<u>67</u>		
18						
19		99			90	
20		<u>74</u>			<u>69</u>	
21						
22						
23						
24						

$\underline{r}=\underline{XX}$: p < .05
 $\underline{r}=\underline{XX}$: p < .01

TABLE 61, continued

(Trials 1-24 by Trials 7-12)

SALINE						
TRIAL						
	7	8	9	10	11	12
1						
2	99	99	99			
3						
4	<u>67</u>	<u>67</u>		90	<u>72</u>	
5	<u>92</u>	<u>92</u>	92			
6						
7		99	99			
8	99		99			
9	99	99				
10					97	
11				97		
12						
13						
14						
15						
16				<u>78</u>	87	
17				<u>82</u>	81	
18						
19	99	99	99			
20	<u>74</u>	<u>74</u>	<u>74</u>			
21						
22				<u>72</u>	<u>76</u>	
23				<u>73</u>	<u>78</u>	
24						

TABLE 61, continued

(Trials 1-24 by Trials 13-18)

SALINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3						
4					<u>67</u>	
5						
6		<u>69</u>	<u>75</u>			
7						
8						
9						
10				<u>78</u>	82	
11				<u>87</u>	81	
12						
13						
14			98	<u>71</u>		
15		98		<u>67</u>		
16		<u>71</u>	<u>67</u>		<u>74</u>	
17				<u>74</u>		
18					83	83
19						
20						
21						
22				<u>76</u>		
23				<u>74</u>		
24						

TABLE 61, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24
1						
2	99	<u>74</u>				
3						
4						
5	90	<u>70</u>				
6						
7	99	<u>74</u>				
8	99	<u>79</u>				
9	99	<u>74</u>				
10				<u>72</u>	<u>73</u>	
11				<u>76</u>	<u>78</u>	
12						
13						
14						
15						
16				<u>76</u>	<u>74</u>	
17						
18						
19		<u>75</u>				
20	<u>75</u>					<u>70</u>
21				<u>68</u>		<u>67</u>
22			<u>68</u>		98	<u>72</u>
23				98		<u>71</u>
24		<u>70</u>	<u>67</u>	<u>72</u>	<u>71</u>	

TABLE 62

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
of LOCOMOTE for the Dependent Measure Event Duration
(Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1	59	59	61	58		
2	61		76	64		
3	58	76		94	63	<u>53</u>
4		64	94		65	<u>65</u>
5			63	65		70
6			<u>53</u>	65	70	
7						
8	<u>45</u>	56	<u>50</u>			
9	<u>54</u>	<u>49</u>	<u>58</u>	<u>52</u>	<u>45</u>	
10			<u>44</u>	<u>45</u>	<u>57</u>	71
11						
12						
13	<u>53</u>		<u>51</u>		<u>56</u>	<u>50</u>
14	<u>48</u>					
15						
16						
17					<u>45</u>	
18						
19						
20						
21						
22					<u>44</u>	60
23						
24						

$\underline{r}=\underline{XX}$: $p < .05$
 $\underline{r}=\underline{XX}$: $p < .01$

TABLE 62, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE					
TRIAL					
	7	8	9	10	11
					12
1					
2		<u>45</u>	<u>54</u>		
3		<u>56</u>	<u>49</u>	<u>49</u>	
4		<u>50</u>	<u>58</u>	<u>45</u>	
5			<u>52</u>	<u>57</u>	
6			<u>45</u>	71	
7		85	63	59	
8	85		80	69	
9	63	80		65	
10	59	69	65		
11					66
12				66	
13	61	62	75	<u>49</u>	
14	68	73	78	<u>56</u>	
15	<u>54</u>	64	80	<u>53</u>	
16			<u>55</u>	<u>51</u>	
17			61		
18					
19					
20	<u>44</u>		<u>53</u>		
21			60	<u>46</u>	
22			57	<u>59</u>	
23					
24					

TABLE 62, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1	<u>53</u>	<u>48</u>				
2						
3	<u>51</u>					
4						
5	<u>56</u>				<u>45</u>	
6	<u>50</u>					
7	61	68	<u>53</u>			
8	62	73	<u>64</u>			
9	75	78	80	<u>55</u>	61	
10	<u>50</u>	<u>56</u>	<u>53</u>	<u>51</u>		
11						<u>46</u>
12						
13		89	83	70	67	
14	89		82	65	60	
15	83	82		83	86	62
16	70		83		91	67
17	67		86	91		82
18			62	67	82	
19	<u>59</u>					
20	<u>65</u>		<u>56</u>			
21	64		<u>58</u>			
22	69		<u>52</u>	<u>51</u>	<u>45</u>	86
23	59	61	<u>50</u>	<u>53</u>	<u>46</u>	
24						

TABLE 62, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5				<u>44</u>		
6				<u>60</u>		
7		<u>44</u>				
8						
9		53	60	75		
10						
11			<u>46</u>	60		
12						
13	59	65	64	69	59	
14	<u>55</u>	70	67	62	61	
15		<u>56</u>	58	<u>52</u>	<u>50</u>	
16				<u>51</u>	<u>53</u>	
17				<u>45</u>	<u>46</u>	
18						
19		87	86	65	65	
20	87		94	72	75	
21	86	94		77	78	<u>50</u>
22	65	72	77		87	<u>58</u>
23	65	75	78	87		67
24			<u>50</u>	58	67	

TABLE 63

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of LOCOMOTE for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1			<u>74</u>			
2						
3	<u>74</u>					
4						
5						
6						
7						
8						
9						
10						
11						
12						
13		<u>69</u>	<u>69</u>			
14		<u>67</u>				
15						
16						
17						
18						
19						
20						
21				<u>68</u>		
22						
23						
24						

$\underline{r}=\underline{XX}$: $p < .05$
 $\underline{r}=\underline{XX}$: $p < .01$

TABLE 63, continued

(Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13					80	
14						
15						
16						
17						
18						
19	<u>70</u>	<u>73</u>				
20						
21						
22						
23					94	
24					<u>74</u>	

TABLE 63, continued

(Trials 1-24 by Trials 13-18)

SALINE						
TRIAL						
	13	14	15	16	17	18
1						
2	<u>69</u>	<u>67</u>				
3	<u>69</u>					
4						
5						
6						
7						
8						
9						
10						
11		80				
12						
13						
14						
15						
16						
17						
18						
19	<u>79</u>					
20					89	
21						
22		81			<u>67</u>	
23		81				
24		<u>73</u>				

TABLE 63, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5			<u>68</u>			
6						
7	<u>70</u>					
8	<u>73</u>					
9						
10						
11				98	95	<u>73</u>
12	<u>73</u>					
13	<u>79</u>					
14				81	81	<u>73</u>
15						
16						
17		89		<u>67</u>		
18						
19						
20						
21						
22					92	
23				92		<u>74</u>
24				<u>74</u>		

TABLE 64

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of REAR for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		97	96	94	79	78
2	97		97	91	68	75
3	96	97		96	78	83
4	94	91	96		89	92
5	79	68	78	89		88
6	78	75	83	92	88	
7	64	65	64	59		
8	<u>53</u>	<u>53</u>	<u>53</u>	<u>48</u>		
9	<u>53</u>	<u>51</u>	<u>56</u>	<u>57</u>	<u>49</u>	
10	<u>67</u>	<u>67</u>	<u>75</u>	<u>75</u>	<u>68</u>	67
11						
12						
13						
14						
15						
16	<u>53</u>	<u>52</u>	<u>56</u>	<u>54</u>		
17						
18						
19	<u>46</u>	<u>46</u>	<u>53</u>	<u>56</u>	<u>42</u>	<u>47</u>
20						
21	<u>46</u>	<u>46</u>	<u>48</u>	<u>45</u>		
22		<u>50</u>	<u>45</u>			
23	<u>52</u>	<u>54</u>	<u>53</u>	<u>47</u>		
24						

$\bar{r} = \text{XX}$: $p < .05$
 $\bar{r} = \text{XX}$: $p < .01$

TABLE 64, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1	64	<u>53</u>	<u>53</u>	67		
2	65	<u>53</u>	<u>51</u>	67		
3	64	<u>53</u>	<u>56</u>	75		
4	59	<u>48</u>	<u>57</u>	75		
5			<u>49</u>	68		
6				67		
7		79	61	71		
8	79		93	80	80	66
9	61	93		89	93	79
10	71	80	89		77	<u>50</u>
11		80	93	77		91
12		66	79	<u>50</u>	91	
13	70	89	85	76		
14	66	87	86	78		
15	64	86	90	78		
16	80	97	95	89		
17	60	75	82	87		
18	61	69	77	81		
19	66	82	90	88		
20	<u>54</u>	86	91	78		
21	<u>67</u>	95	95	83		
22	68	94	85	69		
23	70	97	94	79		
24		79	85	77		

TABLE 64, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1				53		
2				52		
3				56		
4				54		
5						
6						
7	70	66	64	80	60	61
8	89	87	86	97	76	69
9	85	86	90	95	82	77
10	76	78	78	89	87	81
11	80	80	87	83	80	77
12	69	65	73	64	52	56
13		97	92	91	76	77
14	97		93	91	79	78
15	92	93			84	88
16	91	91			86	80
17	76	79	84	86		89
18	77	78	88	80		
19	89	92	92	90	89	88
20	93	96	93	90	81	78
21	90	92	91	95	80	76
22	81	77	77	87	70	66
23	84	81	83	94	75	69
24	82	82	83	83	88	81

TABLE 64, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1	46		46	50	52	
2	<u>46</u>		<u>46</u>	<u>45</u>	<u>54</u>	
3	<u>53</u>		<u>48</u>		<u>53</u>	
4	<u>56</u>		<u>45</u>		<u>47</u>	
5	<u>52</u>					
6	<u>47</u>					
7	66	54	67	68	70	49
8	83	<u>87</u>	95	94	97	<u>79</u>
9	90	91	95	85	94	85
10	88	78	83	69	79	77
11	82	88	85	78	84	92
12	66	74	69	68	72	77
13	89	93	90	81	84	82
14	92	96	92	77	81	82
15	92	93	91	77	83	83
16	90	90	95	87	94	83
17	81	82	80	70	75	88
18	88	78	76	66	69	81
19		92	91	73	80	78
20	92		96	80	85	88
21	91	96		90	94	84
22	73	80	90		97	82
23	80	85	94	97		83
24	78	88	84	82	83	

TABLE 65

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of REAR for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1				<u>68</u>		
2						
3						
4		<u>68</u>				
5						
6						
7						
8		<u>75</u>				
9						
10						
11						
12						
13		<u>80</u>				
14						
15						
16						
17						
18						
19		<u>74</u>				
20						
21						
22						
23						
24						

$\bar{r} = \text{XX}$: $p < .05$
 $\bar{r} = \text{XX}$: $p < .01$

TABLE 65

(Trials 1-24 by Trials 7-12)

SALINE						
TRIAL						
	7	8	9	10	11	12
1						
2		<u>75</u>				
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13		<u>78</u>				
14						
15						
16						
17						
18						
19	<u>70</u>	<u>77</u>		<u>77</u>		
20						
21						
22						
23						
24						

TABLE 65, continued

(Trials 1-24 by Trials 13-18)

SALINE						
TRIAL						
	13	14	15	16	17	18
1						
2	<u>80</u>					
3						
4						
5						
6						
7						
8	<u>78</u>					
9						
10						
11						
12						
13						
14					<u>83</u>	
15						
16						<u>75</u>
17		<u>83</u>				
18				<u>75</u>		
19	<u>69</u>		<u>70</u>			
20		90			90	
21						
22		<u>77</u>			87	
23		<u>75</u>				
24		<u>80</u>			<u>69</u>	

TABLE 65, continued

(Trials 1-24 by Trials 19-24)

	SALINE					
	TRIAL					
	19	20	21	22	23	24
1						
2						
3					<u>67</u>	
4						
5						
6						
7	<u>70</u>					
8	<u>77</u>					
9						
10	<u>77</u>					
11				84		<u>71</u>
12						
13	<u>69</u>					
14		90		<u>77</u>	<u>75</u>	<u>80</u>
15	<u>70</u>					
16						
17		90		87		<u>69</u>
18						
19						
20				84	85	<u>80</u>
21						<u>72</u>
22		84				<u>80</u>
23		85				<u>75</u>
24		<u>80</u>	<u>72</u>	<u>80</u>	<u>75</u>	

TABLE 66

Trial by Trial Significant Correlation Coefficients ($r \times 100$)
 of SNIFF for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		96	93	67	70	67
2	96		97	72	76	73
3	93	97		79	81	76
4	67	72	79		98	85
5	70	76	81	98		89
6	67	73	76	85	89	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18	<u>49</u>					
19						
20						
21						
22						
23						
24						

$\underline{r=XX}$: $p < .05$
 $\underline{r=XX}$: $p < .01$

TABLE 66, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7		78				
8	78		73	<u>54</u>	<u>48</u>	
9		73		<u>86</u>	<u>82</u>	67
10			86		90	81
11		<u>48</u>	82	90	81	81
12			67	81	81	
13	63	69	<u>51</u>			
14	78	84	<u>63</u>	<u>46</u>		
15	59	75	83	<u>66</u>	57	62
16		<u>48</u>	82	73	78	65
17		<u>54</u>	80	83	87	68
18		<u>52</u>	64	<u>52</u>	66	60
19	72	<u>50</u>				
20	71	<u>52</u>				
21	<u>49</u>					
22		<u>45</u>				
23						<u>45</u>
24						

TABLE 66, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						<u>49</u>
2						
3						
4						
5						
6						
7	63	78	59			
8	69	84	75	<u>48</u>	<u>54</u>	<u>52</u>
9	<u>51</u>	63	83	<u>82</u>	<u>80</u>	<u>64</u>
10		<u>46</u>	66	73	83	
11			57	78	87	66
12			61	65	68	
13		77	63	<u>54</u>		
14	77		85		<u>44</u>	<u>66</u>
15	63	85		66	<u>65</u>	<u>66</u>
16	<u>54</u>		66		89	69
17		<u>44</u>	65	89		73
18		<u>52</u>	66	69	73	
19	58	65	60			
20	<u>56</u>	72	62			
21		60	<u>47</u>			
22		64	<u>59</u>			
23		<u>52</u>	<u>48</u>			
24		<u>48</u>	<u>48</u>			

TABLE 66, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5						
6						
7	72	71	<u>49</u>			
8	<u>50</u>	<u>52</u>		<u>45</u>		
9						
10						
11						
12				<u>45</u>		
13	58	<u>56</u>				
14	65	<u>72</u>	60	64	<u>52</u>	<u>48</u>
15	60	62	<u>47</u>	59	<u>48</u>	<u>48</u>
16						
17						
18						
19		93	57			
20	93		77	62	<u>53</u>	
21	57	77		90	<u>85</u>	77
22		62	90		96	92
23		<u>53</u>	85	96		94
24			77	92	94	

TABLE 67, continued

(Trials 1-24 by Trials 7-12)

SALINE						
TRIAL						
	7	8	9	10	11	12
1						
2		82	97			
3						
4			<u>77</u>	<u>69</u>	<u>71</u>	
5			<u>77</u>			
6						
7						
8			<u>79</u>			
9		<u>79</u>				
10					93	
11				93		
12						
13	<u>74</u>					
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

TABLE 67, continued

(Trials 1-24 by Trials 13-18)

SALINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6		<u>78</u>	<u>76</u>			
7	<u>75</u>					
8						
9						
10						
11						
12						
13						
14			84	<u>76</u>		
15		84		<u>71</u>		
16			<u>71</u>		83	
17		<u>76</u>		83		<u>75</u>
18					<u>75</u>	
19						<u>75</u>
20						
21						
22						
23						
24						

TABLE 67, continued

(Trials 1-24 by Trials 19-24)

	SALINE					
	TRIAL					
	19	20	21	22	23	24
1						
2						
3						
4						
5						<u>68</u>
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18	<u>75</u>					
19		86				
20	86					
21				<u>68</u>		
22			<u>68</u>		96	<u>74</u>
23				96		
24				<u>74</u>		

TABLE 68

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of GNAW for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1						
2			68	64		63
3		68		94	88	90
4		64	94		92	96
5			88	92		93
6		63	90	96	93	
7						
8			<u>55</u>	<u>49</u>	<u>49</u>	<u>48</u>
9			<u>77</u>	<u>80</u>	<u>87</u>	<u>85</u>
10			82	86	94	91
11			81	87	95	92
12			63	71	82	80
13						
14						
15					62	<u>56</u>
16			75	82	90	<u>90</u>
17			75	81	93	<u>90</u>
18			62	70	79	80
19						
20	<u>51</u>					
21	<u>52</u>		<u>46</u>	58	70	67
22	<u>60</u>		<u>53</u>	50	61	<u>50</u>
23			<u>57</u>	61	64	<u>66</u>
24				<u>50</u>	<u>54</u>	62

$\underline{r=XX}$: $p < .05$
 $\underline{r=XX}$: $p < .01$

TABLE 68, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3		<u>55</u>	77	82	81	63
4		<u>49</u>	80	86	87	71
5		<u>49</u>	87	94	95	82
6		<u>49</u>	85	91	92	80
7						
8						
9		77	77	58	<u>55</u>	61
10		58	94	94	<u>93</u>	93
11		<u>55</u>	93	99	99	84
12		61	93	84	85	85
13						
14						<u>56</u>
15			<u>52</u>	<u>56</u>	<u>58</u>	<u>77</u>
16		58	<u>95</u>	<u>96</u>	<u>97</u>	90
17		58	95	96	98	93
18		58	92	84	85	95
19		47				
20						
21			70	70	71	84
22			61	<u>55</u>	<u>55</u>	<u>55</u>
23			74	70	71	73
24			64	60	63	69

TABLE 68, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3				75	75	62
4				82	81	70
5			62	90	93	79
6			<u>56</u>	90	90	80
7						
8				58	58	58
9			<u>52</u>	95	95	92
10			<u>56</u>	96	96	84
11			58	97	97	85
12		<u>56</u>	77	90	93	95
13						
14			86	<u>51</u>	<u>53</u>	<u>56</u>
15		86		<u>64</u>	70	70
16		<u>51</u>	64		98	94
17		<u>53</u>	70	98		93
18		<u>56</u>	70	94	93	
19	78					
20	57					
21		60	85	76	77	83
22				<u>55</u>	<u>51</u>	59
23			<u>51</u>	<u>77</u>	<u>71</u>	83
24		72	<u>63</u>	76	69	82

TABLE 68, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1		<u>51</u>				
2						
3						
4						
5						
6						
7						
8	<u>47</u>					
9						
10						
11						
12						
13	79	57				
14						
15						
16						
17						
18						
19		72				
20	72		<u>53</u>	59		
21		<u>53</u>		68	85	71
22		59	68		89	
23			85	89		73
24			71		73	

TABLE 69

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of NOD for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		<u>47</u>	63	<u>51</u>	60	
2	<u>47</u>		<u>51</u>			
3	<u>63</u>	<u>51</u>		87	77	<u>56</u>
4	<u>51</u>		87		85	<u>60</u>
5	<u>60</u>		77	85		77
6			<u>56</u>	60	77	
7						
8						
9						
10				59	58	
11				<u>45</u>	<u>53</u>	
12						
13						
14		<u>46</u>				
15		<u>45</u>			<u>45</u>	<u>45</u>
16			<u>45</u>	<u>48</u>	<u>53</u>	<u>56</u>
17						<u>49</u>
18						<u>56</u>
19						
20						
21						
22						
23						
24						

$\underline{r} = \underline{XX}$: $p < .05$
 $\underline{r} = \underline{XX}$: $p < .01$

TABLE 69, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3						
4				59	<u>45</u>	
5				58	<u>53</u>	
6						
7		67				
8	67					
9						
10					85	
11				85		
12						
13						
14						
15	<u>47</u>					
16						
17	<u>56</u>	<u>50</u>				<u>44</u>
18						
19	69					
20						
21	61	<u>52</u>				
22						
23			<u>46</u>			
24				71	<u>48</u>	

TABLE 69, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2		<u>46</u>	<u>45</u>			
3				<u>45</u>		
4				<u>48</u>		
5				<u>53</u>		
6			<u>45</u>	<u>56</u>	<u>49</u>	<u>56</u>
7			<u>47</u>		<u>56</u>	69
8					<u>50</u>	
9						
10						
11						
12					<u>44</u>	
13						
14			<u>48</u>	<u>50</u>		<u>56</u>
15		<u>48</u>				<u>57</u>
16		<u>50</u>			58	<u>63</u>
17				58		64
18		<u>56</u>	<u>57</u>	<u>63</u>	64	
19						
20				<u>48</u>		99
21			68	<u>43</u>	<u>49</u>	<u>59</u>
22				<u>47</u>	<u>58</u>	<u>49</u>
23					<u>46</u>	
24						

TABLE 69, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5						
6						
7			61			
8			<u>52</u>			
9					<u>46</u>	
10						71
11						<u>48</u>
12						
13						
14						
15			68			
16		<u>48</u>	<u>43</u>	<u>47</u>		
17			<u>49</u>	<u>58</u>	<u>46</u>	
18			<u>59</u>	<u>49</u>		
19		99	<u>53</u>			
20	99		<u>54</u>	<u>52</u>		
21	<u>53</u>	<u>54</u>		<u>67</u>	<u>49</u>	
22		<u>52</u>	67		<u>78</u>	<u>56</u>
23			<u>49</u>	78		<u>47</u>
24				<u>56</u>	<u>47</u>	

TABLE 70

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of HEADDOWN for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1						68
2						
3						
4						
5						
6	68					
7						
8						
9						
10						
11						
12		97				
13	54					
14	58					90
15			87			
16			99			
17			99			
18			99			
19	57					
20	47					
21	47					
22	79					
23	64					
24	68					

$\underline{r=XX}$: $p < .05$
 $\underline{r=XX}$: $p < .01$

TABLE 70, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3						97
4						
5						
6						
7						
8						
9						
10						
11						
12						
13		61				
14						
15						
16						
17						
18						
19						
20						
21						
22						
23		<u>47</u>				
24						

TABLE 70, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1		58				
2						
3			87	99	99	99
4						
5						
6		90				
7						
8	61					
9						
10						
11						
12						
13						
14						
15				82	82	82
16			82		99	99
17			82	99		99
18			82	99	99	
19	62					
20						
21						
22	46					
23	<u>76</u>					
24						

TABLE 70, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1	57	<u>47</u>	<u>47</u>	79	64	68
2						
3						
4						
5						
6				<u>46</u>		
7						
8					<u>47</u>	
9						
10						
11						
12						
13	63			<u>46</u>	76	
14						
15						
16						
17						
18						
19		89	89	86	94	73
20	89		99	84	69	73
21	89	99		84	69	73
22	86	84	84		82	87
23	94	69	69	82		69
24	73	73	73	87	69	

TABLE 71

Trial by Trial Significant Correlation Coefficients ($r \times 100$)
 of GROOM for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12			<u>-68</u>			
13						
14						
15						
16						<u>78</u>
17						
18						
19						
20						
21			<u>68</u>			
22		<u>-69</u>		<u>67</u>		
23		<u>-80</u>				
24						

$r = \text{XX}$: $p < .05$
 $r = \text{XX}$: $p < .01$

TABLE 71, continued

(Trials 1-24 by Trials 7-12)

SALINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3						
4						<u>-68</u>
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16		<u>-69</u>				
17				87		
18						
19		96				
20						
21						
22						
23						
24						

TABLE 71, continued

(Trials 1-24 by Trials 13-18)

	SALINE					
	TRIAL					
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6			<u>78</u>			
7				<u>-69</u>		
8						
9						
10					87	
11						
12						
13						
14						
15						
16						
17						
18						
19						<u>68</u>
20						
21						
22						
23						
24						

TABLE 71, continued

(Trials 1-24 by Trials 19-24)

	SALINE					
	TRIAL					
	19	20	21	22	23	24
1						
2				- <u>69</u>	- <u>80</u>	
3			<u>68</u>			
4				<u>67</u>		
5						
6						
7	96					
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18	<u>68</u>					
19						
20						
21						
22					<u>76</u>	87
23				<u>76</u>		
24					87	

TABLE 72

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of INACTIVE for the Dependent Measure Event Duration
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1						
2			99		83	
3		99			83	
4						
5		83	83			
6						
7		99	99		83	
8		99	99		83	
9		99	99		83	
10				82		
11				<u>70</u>		
12						
13						
14						
15						<u>74</u>
16						
17						
18						
19		93	93		<u>73</u>	
20		<u>68</u>	<u>68</u>			
21						
22						
23						
24						

$\bar{r} = \overline{XX}$: $p < .05$
 $\underline{r} = \underline{XX}$: $p < .01$

TABLE 72, continued

(Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1						
2	99	99	99			
3	99	99	99			
4				82	<u>70</u>	
5	83	83	83			
6						
7		99	99			
8	99		99			
9	99	99				
10					95	
11				95		
12						
13						
14						
15						
16				89	86	
17				<u>71</u>	<u>68</u>	
18						
19	93	93	91			
20	<u>68</u>	<u>68</u>				
21						
22				91	90	
23				88	96	
24				<u>67</u>	<u>79</u>	

TABLE 72, continued

(Trials 1-24 by Trials 13-18)

	SALINE					
	TRIAL					
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6			<u>74</u>			
7						
8						
9						
10				89	<u>71</u>	
11				86	<u>68</u>	
12						
13						
14			88			
15		88				
16					<u>69</u>	
17				<u>69</u>		82
18					82	
19						
20		86				
21		<u>68</u>		<u>67</u>		
22				<u>91</u>		
23				83		
24				<u>67</u>		

TABLE 72, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24
1						
2	93	<u>68</u>				
3	93	<u>68</u>				
4						
5	<u>73</u>					
6						
7	93	<u>68</u>				
8	93	<u>68</u>				
9	91					
10				91	88	<u>67</u>
11				90	96	<u>79</u>
12						
13						
14		86	<u>68</u>			
15			<u>67</u>			
16				91	83	67
17						
18						
19						
20						
21				<u>76</u>	<u>67</u>	<u>68</u>
22			<u>76</u>		<u>93</u>	<u>79</u>
23			<u>67</u>	93		<u>77</u>
24			<u>68</u>	<u>79</u>	<u>77</u>	

TABLE 72

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
of LOCOMOTE for the Dependent Measure Event Count
(Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		57	<u>47</u>			
2	57		<u>82</u>	<u>54</u>		
3	<u>47</u>	82		<u>88</u>		<u>49</u>
4		<u>54</u>	88		68	<u>73</u>
5				68		<u>58</u>
6			<u>49</u>	73	58	
7						
8		59	<u>52</u>			<u>44</u>
9		<u>78</u>	<u>77</u>	59		
10			57	<u>67</u>		79
11				<u>46</u>		71
12						62
13		58	59	<u>56</u>		
14		<u>53</u>	58	<u>59</u>		<u>55</u>
15		<u>52</u>	69	74	58	<u>65</u>
16				<u>45</u>		81
17				<u>45</u>	50	<u>52</u>
18				59	64	<u>63</u>
19		<u>55</u>	<u>48</u>			
20			<u>47</u>			<u>54</u>
21		60	<u>69</u>	66		<u>55</u>
22			67	78	59	<u>83</u>
23				<u>47</u>	55	<u>64</u>
24						

$\bar{r} = \text{XX}$: $p < .05$
 $\bar{r} = \text{XX}$: $p < .01$

TABLE 73, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE

	TRIAL					
	7	8	9	10	11	12
1						
2		59	78			
3		<u>52</u>	77	57		
4			59	67	<u>46</u>	
5						
6		<u>44</u>		79	71	62
7		88	<u>54</u>	<u>54</u>		
8	88		71	<u>68</u>		
9	<u>54</u>	71		61		
10	<u>54</u>	68	61		<u>54</u>	61
11				<u>54</u>		62
12				61	62	
13	<u>56</u>	61	73	63		
14	<u>69</u>	80	73	68		
15	59	66	66	70	<u>47</u>	
16				57	<u>46</u>	
17				<u>48</u>	<u>51</u>	<u>50</u>
18					<u>55</u>	<u>48</u>
19	57	<u>55</u>	67			
20	83	<u>79</u>	62	58		
21	<u>45</u>	60	78	58		
22		<u>48</u>	<u>55</u>	63	63	
23						
24						

TABLE 73, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2	58	<u>53</u>	<u>52</u>			
3	60	58	69			
4	<u>56</u>	59	74	<u>45</u>	<u>45</u>	59
5			58		<u>50</u>	64
6		<u>55</u>	65	<u>56</u>	<u>52</u>	63
7	<u>56</u>	69	59			
8	61	80	66			
9	73	73	66			
10	63	68	70	56	<u>4</u>	
11			<u>47</u>	<u>46</u>	<u>5</u>	<u>55</u>
12					<u>50</u>	<u>48</u>
13		80	83	75	66	
14	80		90	66	62	
15	83	90		76	76	57
16	75	66	76		90	64
17	66	62	76	90		78
18			57	64	78	
19	63	76	63			
20	68	81	76	<u>49</u>		
21	60	80	76	<u>48</u>		
22	61	73	81	<u>68</u>	59	58
23		<u>51</u>	59	66	65	72
24						<u>50</u>

TABLE 73, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
	TRIAL					
	19	20	21	22	23	24
1						
2	<u>55</u>		60			
3	<u>48</u>	<u>47</u>	69	67		
4			66	78	<u>47</u>	
5				59	<u>55</u>	
6		<u>54</u>	<u>55</u>	83	<u>64</u>	
7	57	83	<u>45</u>			
8	<u>55</u>	79	<u>60</u>	<u>48</u>		
9	67	62	78	<u>55</u>		
10		58	58	70		
11				63		
12						
13	63	68	60	61		
14	76	82	80	73	<u>51</u>	
15	63	76	76	81	<u>59</u>	
16		<u>49</u>	<u>48</u>	68	66	
17				59	65	
18				58	72	<u>50</u>
19		73	79	<u>49</u>		
20	63		66	<u>68</u>		
21	79	66		78	60	
22	<u>49</u>	68	78		72	
23			60	72		67
24					67	

TABLE 74

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of LOCOMOTE for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1			<u>70</u>			
2						
3	<u>70</u>					
4						
5						
6						
7						
8						
9						
10						
11		<u>71</u>				
12						
13						
14		82				
15						
16						
17						
18						
19						
20						
21						
22						
23		<u>68</u>				
24						

$\bar{r} = \text{XX}$: $p < .05$
 $\bar{r} = \text{XX}$: $p < .01$

TABLE 74, continued

(Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1						
2					<u>71</u>	
3						
4						
5						
6						
7						
8					<u>69</u>	<u>78</u>
9						
10						
11		<u>69</u>				
12		<u>78</u>				
13						<u>75</u>
14					81	
15						
16						
17						
18						
19	<u>70</u>					<u>68</u>
20						
21						
22						
23				<u>74</u>	84	
24						

TABLE 74, continued

(Trials 1-24 by Trials 13-18)

SALINE					
TRIAL					
13	14	15	16	17	18
1					
2		82			
3					
4					
5					
6					
7					
8					
9					
10					
11		81			
12	<u>75</u>				
13					
14					
15					
16					
17				<u>78</u>	
18			<u>78</u>		
19	84				
20			81	92	
21					
22					
23		85			
24		<u>75</u>			

TABLE 74, continued.

(Trials 1-24 by Trials 19-24)

	SALINE					
	TRIAL					
	19	20	21	22	23	24
1						
2					<u>68</u>	
3						
4						
5						
6						
7	<u>70</u>					
8						
9						
10					<u>74</u>	
11					<u>84</u>	
12	<u>68</u>					
13	84					
14					85	<u>75</u>
15						
16		81				
17		97				
18						
19						
20						
21						
22						
23						<u>75</u>
24					<u>75</u>	

TABLE 75

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
of REAR for the Dependent Measure Event Count
(Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		99	94	94	96	84
2	99		95	96	95	81
3	94	95		92	85	68
4	94	96	92		89	65
5	96	95	85	89		85
6	84	81	68	65	85	
7	90	89	83		86	88
8	80	81	81		74	69
9	80	81	82	72	76	73
10	70	71	73	65	75	61
11	<u>53</u>	<u>53</u>	<u>53</u>	<u>47</u>	<u>58</u>	<u>50</u>
12	<u>52</u>	<u>53</u>	<u>44</u>	<u>44</u>	<u>58</u>	<u>58</u>
13	<u>50</u>	<u>52</u>	59	<u>50</u>	<u>56</u>	
14			<u>46</u>		<u>49</u>	
15	65	<u>66</u>	<u>58</u>	59	<u>68</u>	65
16	72	<u>72</u>	66	63	73	73
17	63	60	<u>51</u>	<u>46</u>	65	74
18	<u>50</u>	<u>50</u>			<u>54</u>	63
19	<u>47</u>	<u>49</u>	<u>50</u>	<u>44</u>	<u>51</u>	
20	<u>58</u>	<u>56</u>	<u>56</u>	<u>46</u>	<u>65</u>	57
21	<u>47</u>	<u>46</u>	<u>47</u>		<u>55</u>	<u>51</u>
22			<u>47</u>			
23						
24						

$\underline{r} = \underline{XX}$: $p < .05$

$\underline{r} = \underline{XX}$: $p < .01$

TABLE 75, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE

		TRIAL				
		8	9	10	11	12
1	90	80	80	70	<u>53</u>	<u>52</u>
2	89	81	81	71	<u>53</u>	<u>53</u>
3	83	81	82	73	<u>53</u>	<u>44</u>
4	78	74	72	65	<u>48</u>	<u>44</u>
5	86	74	76	75	<u>63</u>	<u>53</u>
6	88	69	73	61	<u>50</u>	<u>58</u>
7		92	93	80	64	78
8	92		99	88	76	86
9	93	99		92	80	86
10	80	88	92		89	78
11	64	76	80	89		79
12	78	86	86	78	79	
13	63	76	79	93	85	68
14	<u>49</u>	62	69	88	89	59
15	<u>86</u>	87	87	83	76	89
16	90	91	93	87	79	91
17	81	82	82	69	80	89
18	74	77	79	72	84	91
19	62	74	74	74	76	80
20	66	66	72	73	77	59
21	64	70	77	83	89	75
22	60	78	78	76	73	74
23		61	61	64	73	77
24				<u>51</u>	89	

TABLE 75, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1	<u>50</u>		65	72	63	<u>50</u>
2	<u>52</u>		66	72	60	<u>50</u>
3	<u>59</u>	<u>46</u>	58	66	<u>51</u>	
4	<u>50</u>		59	63	<u>46</u>	
5	<u>56</u>	<u>49</u>		73	<u>65</u>	<u>54</u>
6			95	73	74	<u>63</u>
7	62	<u>49</u>	86	90	81	74
8	76	<u>62</u>	87	91	82	77
9	79	<u>69</u>	87	93	82	79
10	93	88	83	87	69	72
11	85	80	76	79	80	84
12	68	<u>59</u>	89	91	87	91
13		94	79	77	<u>54</u>	66
14	94		67	68	<u>52</u>	65
15	79	67		94	79	85
16	77	68	94		82	86
17	<u>54</u>	<u>52</u>	79	82		91
18	66	<u>65</u>	85	86	91	
19	80	73	77	75	66	70
20	72	75	71	78	68	71
21	83	89	78	84	73	85
22	79	72	69	67	65	70
23	73	66	68	64	<u>53</u>	72
24	63	79				

TABLE 75, continued

(Trials 1-24 by 19-24)

APOMORPHINE

TRIAL						
	19	20	21	22	23	24
1	47	58	46			
2	<u>49</u>	<u>56</u>	<u>46</u>			
3	<u>50</u>	<u>56</u>	<u>47</u>	47		
4	<u>44</u>	<u>46</u>				
5	<u>51</u>	<u>65</u>	<u>55</u>			
6		57	<u>51</u>			
7	62	66	64	60		
8	74	66	70	78	61	
9	74	72	77	78	61	
10	74	73	83	76	64	51
11	76	77	89	73	73	69
12	70	59	75	74	77	
13	80	72	83	79	73	63
14	73	75	89	72	66	79
15	77	71	78	69	68	
16	75	78	84	67	64	
17	66	68	73	65	<u>53</u>	
18	70	71	85	70	72	
19		87	82	75	67	<u>52</u>
20	87		91	58	<u>47</u>	<u>51</u>
21	82	91		74	<u>71</u>	<u>64</u>
22	75	58	74		78	63
23	67	<u>47</u>	71	78		<u>52</u>
24	<u>52</u>	<u>51</u>	64	63	<u>52</u>	

TABLE 76

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of REAR for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

	SALINE					
	TRIAL					
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7	73	69				
8		91				
9						
10						
11						
12					83	
13		77				
14						
15						71
16						
17						
18						
19						
20						
21						
22						
23						
24						

$\bar{r} = \text{XX} : p < .05$
 $\bar{r} = \text{XX} : p < .01$

TABLE 76, continued

(Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1	<u>73</u>					
2	<u>69</u>	91				
3						
4						
5						83
6						
7						
8				<u>79</u>		
9				<u>69</u>		
10		<u>79</u>	<u>69</u>			
11						
12						
13		<u>70</u>				
14						
15						
16						
17						
18						
19		<u>70</u>				
20						
21						<u>67</u>
22						
23			90	<u>73</u>		
24			<u>74</u>			<u>68</u>

TABLE 76, continued

(Trials 1-24 by Trials 13-18)

	SALINE					
	TRIAL					
	13	14	15	16	17	18
1						
2	77					
3						
4						
5						
6			71			
7						
8	70					
9						
10						
11						
12						
13						
14					94	
15						
16						
17		94				
18						
19						
20		95				94
21						
22						
23						
24						

TABLE 76, continued

(Trials 1-24 by Trials 19-24)

	SALINE					
	TRIAL					
	19	20	21	22	23	24
1						
2						
3						
4						
5						
6						
7	<u>70</u>					
8						
9					90	<u>74</u>
10					<u>73</u>	
11						
12			<u>67</u>			<u>68</u>
13						
14		95				
15						
16						
17		94				
18						
19						
20						
21						
22						
23						
24						

TABLE 77

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of SNIFF for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		66				
2	66		60			<u>45</u>
3		60		61	58	<u>60</u>
4			61		88	<u>58</u>
5			58	88		<u>72</u>
6		<u>45</u>	60	58	72	
7	<u>46</u>	<u>53</u>	<u>55</u>			<u>44</u>
8	<u>45</u>	<u>68</u>	<u>57</u>			<u>78</u>
9	<u>45</u>	58	64			66
10			<u>55</u>	<u>55</u>	72	<u>77</u>
11			<u>49</u>	<u>75</u>	80	<u>66</u>
12						<u>47</u>
13	68	<u>49</u>	63		<u>53</u>	<u>56</u>
14	57	<u>66</u>	66	<u>45</u>	<u>47</u>	<u>79</u>
15	60	66	65	<u>48</u>	<u>50</u>	71
16	<u>49</u>		<u>54</u>	<u>49</u>	<u>59</u>	<u>73</u>
17	<u>46</u>		<u>46</u>	<u>50</u>	60	<u>71</u>
18				<u>64</u>	71	<u>46</u>
19	59			<u>45</u>		
20	<u>56</u>	<u>52</u>	<u>48</u>	<u>55</u>		72
21	72	<u>66</u>	<u>50</u>	<u>47</u>		65
22	<u>49</u>	<u>54</u>	57	60	<u>56</u>	<u>75</u>
23	<u>55</u>			67	<u>69</u>	69
24	<u>55</u>					

$r = \text{XX} : p < .05$
 $r = \text{XX} : p < .01$

TABLE 77, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
	TRIAL					
	7	8	9	10	11	12
1	<u>46</u>	<u>45</u>	<u>45</u>			
2	<u>53</u>	<u>68</u>	<u>58</u>			
3	<u>55</u>	57	64	<u>55</u>	<u>49</u>	
4				<u>55</u>	<u>75</u>	
5				<u>72</u>	80	
6	<u>44</u>	78	66	77	66	<u>47</u>
7		65	69	<u>50</u>	<u>52</u>	
8	65		79	<u>53</u>	<u>48</u>	
9	69	79		69	<u>59</u>	
10	<u>50</u>	<u>53</u>	69		76	<u>56</u>
11	<u>52</u>	<u>48</u>	59	76		<u>60</u>
12				<u>56</u>	60	
13	<u>56</u>	<u>52</u>	65	57	57	
14	<u>51</u>	86	76	<u>53</u>	<u>49</u>	
15	58	82	74	<u>55</u>	<u>53</u>	
16	68	63	78	68	61	
17	71	66	80	72	81	<u>53</u>
18	<u>45</u>		58	63	68	
19	<u>51</u>		<u>56</u>	<u>52</u>	60	
20	70	78	<u>78</u>	<u>58</u>	64	<u>49</u>
21	64	79	82	61	<u>55</u>	<u>45</u>
22	65	78	63	63	65	
23	<u>56</u>	<u>52</u>	61	65	64	<u>45</u>
24	<u>49</u>		<u>54</u>	<u>46</u>		

TABLE 77, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE.						
TRIAL						
	13	14	15	16	17	18
1	68	57	60	<u>49</u>	<u>46</u>	
2	<u>49</u>	66	66			
3	63	66	65	<u>54</u>	<u>46</u>	
4		<u>45</u>	<u>48</u>	<u>49</u>	<u>50</u>	64
5	<u>53</u>	<u>47</u>	<u>50</u>	<u>59</u>	<u>60</u>	71
6	<u>56</u>	79	71	73	71	<u>46</u>
7	<u>56</u>	51	58	68	71	<u>45</u>
8	<u>52</u>	86	82	63	66	
9	65	76	74	78	80	<u>58</u>
10	57	<u>53</u>	<u>55</u>	68	82	63
11	57	<u>49</u>	<u>53</u>	64	81	68
12					<u>53</u>	
13		78	83	75	72	63
14	78		95	78	71	<u>53</u>
15	83	95		77	71	60
16	75	78	77		85	74
17	72	71	71	85		70
18	63	<u>53</u>	60	74	70	
19	71	<u>46</u>	<u>48</u>	64	69	64
20	62	<u>77</u>	<u>77</u>	84	80	57
21	65	77	76	73	70	<u>52</u>
22	61	76	80	75	65	<u>52</u>
23	63	61	60	82	70	71
24	<u>50</u>	<u>50</u>	<u>50</u>	65	<u>51</u>	

TABLE 77, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1	59	<u>56</u>	72	<u>49</u>	<u>55</u>	<u>55</u>
2		<u>52</u>	66	<u>54</u>		
3		<u>48</u>	<u>50</u>	<u>57</u>		
4	<u>45</u>	<u>55</u>	<u>46</u>	60	67	
5	<u>48</u>	<u>50</u>		<u>56</u>	69	
6		72	65	<u>75</u>	69	
7	<u>51</u>	70	64	65	<u>56</u>	<u>49</u>
8		78	79	77	<u>52</u>	
9	<u>56</u>	78	82	63	<u>61</u>	<u>54</u>
10	<u>52</u>	58	61	63	65	<u>46</u>
11	60	64	<u>55</u>	65	64	
12		<u>49</u>	<u>45</u>		<u>45</u>	
13	71	62	65	61	63	<u>50</u>
14	<u>46</u>	77	77	76	61	<u>50</u>
15	<u>48</u>	77	76	80	60	<u>50</u>
16	<u>64</u>	84	73	75	82	<u>65</u>
17	69	80	70	65	70	<u>51</u>
18	64	57	<u>52</u>	<u>52</u>	71	
19		72	71	<u>52</u>	79	67
20	72		90	<u>84</u>	80	70
21	71	90		79	76	68
22	<u>52</u>	84	79		75	57
23	<u>79</u>	80	<u>76</u>	75		72
24	67	70	68	57	72	

TABLE 78

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of SNIFF for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

	SALINE					
	TRIAL					
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

$r = \text{XX}$: p < .05
 $r = \text{XX}$: p < .01

TABLE 78, continued

(Trials 1-24 by Trials 7-12)

SALINE						
TRIAL						
	7	8	9	10	11	12
1						
2				<u>68</u>	87	
3		<u>-72</u>			<u>71</u>	
4						
5						
6						
7			<u>68</u>			
8		<u>68</u>		<u>75</u>		
9			<u>75</u>			
10					<u>74</u>	
11				<u>74</u>		
12						
13		<u>69</u>				
14						
15						
16						
17					<u>71</u>	
18						
19	93					
20						
21	<u>68</u>					
22				82	<u>75</u>	
23				81	<u>76</u>	
24						<u>70</u>

TABLE 78, continued

(Trials 1-24 by Trials 13-18)

	SALINE					
	TRIAL					
	13	14	15	16	17	18
1					<u>68</u>	
2						
3						
4						
5						
6			<u>67</u>			
7						
8	<u>69</u>					
9						
10						
11					<u>71</u>	
12						
13						
14						83
15						
16					<u>71</u>	
17				<u>71</u>		
18		83				
19	<u>77</u>					
20				<u>80</u>	84	
21						
22						
23						
24	<u>72</u>					

TABLE 78, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24
1						
2					68	
3						
4						
5						
6						
7	93		<u>68</u>			
8						
9						
10				83	81	
11				<u>75</u>	<u>76</u>	
12						<u>70</u>
13	<u>77</u>					<u>72</u>
14						
15						
16		<u>80</u>				
17		<u>84</u>				
18						
19						
20						
21						
22					94	83
23				94		<u>78</u>
24				<u>83</u>	<u>78</u>	

TABLE 79

Trial By Trial Significant Correlation Coefficients ($r \times 100$)
 of GNAW for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

AFOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1		<u>49</u>				
2	<u>49</u>		64	64	<u>51</u>	61
3		64		94	<u>92</u>	96
4		64	94		95	98
5		<u>51</u>	92	95		93
6		61	96	98	93	
7						
8			<u>54</u>	<u>49</u>	<u>47</u>	<u>55</u>
9	78		70	78	82	77
10	71	<u>50</u>	79	82	87	82
11	69	<u>49</u>	85	88	91	90
12	73		69	78	80	78
13						
14						
15	70			<u>56</u>	59	<u>52</u>
16			82	83	88	84
17			83	85	89	87
18			71	79	84	78
19						
20	99					
21	89		<u>55</u>	62	65	62
22	79		<u>58</u>	58	61	59
23	59		63	68	73	65
24				<u>54</u>	60	<u>47</u>

$\underline{r=XX}$: $p < .05$
 $\underline{r=XX}$: $p < .01$

TABLE 79, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE					
TRIAL					
7	8	9	10	11	12
1		78	72	69	73
2			<u>50</u>	<u>49</u>	
3		71	<u>79</u>	<u>85</u>	69
4		78	82	88	78
5		82	87	91	80
6		77	82	90	78
7					
8				<u>45</u>	<u>46</u>
9			97	<u>96</u>	<u>96</u>
10		97		96	90
11	<u>45</u>	96	96		95
12	<u>46</u>	96	90	95	
13					
14					
15		81	71	74	83
16	61	77	82	83	77
17	68	80	82	87	84
18	60	78	78	80	81
19	<u>55</u>				
20		80	74	72	75
21		95	91	86	90
22		88	89	79	79
23		88	91	80	79
24		<u>46</u>	<u>52</u>		

TABLE 79, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1			70			
2						
3				82	83	71
4			<u>56</u>	83	85	80
5			<u>58</u>	88	89	84
6			<u>52</u>	84	87	78
7						
8				61	68	60
9			81	77	80	78
10			71	82	82	78
11			74	83	87	80
12			83	77	84	81
13						
14			65			
15		65			<u>49</u>	<u>52</u>
16					98	96
17			<u>49</u>	98		97
18			<u>52</u>	96	97	
19	75					
20			72			
21			79	61	64	61
22			<u>54</u>	69	66	63
23			<u>55</u>	82	77	79
24				73	65	77

TABLE 79, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1		99	89	79	59	
2						
3			<u>55</u>	58	63	
4			62	58	68	54
5			65	61	73	60
6			62	59	65	<u>47</u>
7						
8	<u>55</u>					
9		80	95	88	88	<u>46</u>
10		74	91	89	91	<u>52</u>
11		72	86	79	80	
12		75	90	79	79	
13	75					
14						<u>46</u>
15		72	79	<u>54</u>	<u>55</u>	
16			61	<u>69</u>	<u>82</u>	73
17			64	66	77	65
18			61	63	79	77
19						
20			91	81	61	
21		91		93	86	
22		81	93		93	
23		61	86	93		69
24					69	

TABLE 80

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of NOD for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1			<u>44</u>			
2						
3	<u>44</u>			87	85	<u>47</u>
4			87		79	
5			85	79		72
6			<u>47</u>		72	
7						
8						
9				<u>45</u>		
10			57	<u>61</u>	69	
11						
12						
13						
14		<u>56</u>				
15						
16					- <u>48</u>	- <u>54</u>
17						
18						- <u>47</u>
19						
20						
21						
22						
23						
24						

$\bar{r} = \text{XX}$: $p < .05$
 $\underline{r} = \text{XX}$: $p < .01$

TABLE 80, continued
 (Trials 1-24 by Trials 7-12)

APOMORPHINE					
TRIAL					
7	8	9	10	11	12
1					
2					
3			57		
4		<u>45</u>	61		
5			69		
6					
7					<u>45</u>
8					
9			<u>56</u>		
10		<u>56</u>		79	
11			79		<u>49</u>
12	<u>45</u>			<u>49</u>	
13					
14					
15	92	74			
16					
17					
18	74	<u>52</u>			
19					
20					
21	<u>50</u>	92			
22					
23			<u>51</u>		
24		<u>49</u>	<u>47</u>		

TABLE 80, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2		<u>56</u>				
3						
4						
5				-48		
6				<u>-54</u>		<u>-47</u>
7			92			74
8			74			<u>52</u>
9						
10						
11						
12						
13						
14				<u>47</u>		
15						78
16		<u>47</u>			60	<u>50</u>
17				60		<u>46</u>
18				<u>50</u>	<u>46</u>	
19						
20				<u>49</u>	77	
21			<u>51</u>			
22				58	84	
23					73	
24					<u>47</u>	

TABLE 80, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5						
6						
7			$\frac{50}{92}$			
8						$\frac{49}{47}$
9						
10					<u>51</u>	
11						
12			<u>47</u>			
13						
14						
15			<u>51</u>			
16		$\frac{49}{77}$		$\frac{58}{84}$		
17					73	<u>47</u>
18						
19						
20				92	76	
21						70
22		92			76	
23		76		76		
24			70			

TABLE 81

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of HEADDOWN for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1						65
2						
3						
4						
5						
6	65					
7						
8						
9						
10						
11		69				
12						
13						
14		<u>44</u>				69
15						
16						
17						
18						
19		70				
20						
21						
22						
23						
24						

$\bar{r} = \text{XX}$: p < .05
 $\bar{r} = \text{XX}$: p < .01

TABLE 81, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3						69
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						69
15						
16						
17						
18						
19	<u>50</u>					88
20						
21						
22						
23						
24						

TABLE 81, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2		<u>44</u>				
3						
4						
5						
6		69				
7						
8						
9						
10						
11						
12		69				
13						
14						
15						
16						
17						
18						
19	<u>53</u>	70				
20						
21						
22						
23						
24						

TABLE 81, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2	70					
3						
4						
5						
6						
7	<u>50</u>					
8						
9						
10						
11						
12	88					
13	<u>53</u>					
14	70					
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

TABLE 82

Trial By Trial Significant Correlation Coefficients ($\underline{r} \times 100$)
 of JUMP for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

APOMORPHINE						
TRIAL						
	1	2	3	4	5	6
1						
2						
3				84		83
4			84		<u>45</u>	79
5				<u>45</u>		<u>54</u>
6			83	<u>79</u>	<u>54</u>	
7						
8						
9						
10			66	78		74
11						
12			<u>50</u>	<u>45</u>		<u>46</u>
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

$\underline{r}=\underline{XX}$: $p < .05$
 $\underline{r}=\underline{XX}$: $p < .01$

TABLE 82, continued

(Trials 1-24 by Trials 7-12)

APOMORPHINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3				66		<u>50</u>
4				78		<u>45</u>
5						
6				74		<u>46</u>
7						
8			<u>51</u>	65		
9			<u>85</u>	62	79	<u>55</u>
10	<u>51</u>	85		<u>53</u>	65	
11	<u>65</u>	62	<u>53</u>			63
12		79	<u>65</u>			<u>50</u>
13		<u>55</u>		63	<u>50</u>	
14	65	70	90	<u>50</u>		
15	58	78	90	<u>54</u>	61	
16	58	72	86		68	
17	<u>50</u>	73	80	<u>56</u>	65	
18		<u>47</u>		<u>47</u>	<u>56</u>	66
19		<u>62</u>	63		<u>77</u>	<u>47</u>
20	78	<u>52</u>	63			
21	59					
22	64			<u>53</u>		<u>51</u>
23	58	69	74		61	
24	<u>56</u>	64	76		<u>56</u>	
		72	58		<u>67</u>	

TABLE 82, continued

(Trials 1-24 by Trials 13-18)

APOMORPHINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6						
7	65	58	58	50		
8	70	79	72	73	47	62
9	90	90	86	80		63
10	50	54		56	47	
11		61	68	65	56	77
12					66	47
13		87	82	68		46
14	87		95	92	64	78
15	82	95		92	70	87
16	68	92	92		85	89
17		64	70	85		88
18	46	78	87	89	88	
19	70	73	73	60	48	57
20		58	57	57	66	82
21		65	62	71	81	65
22	69	83	82	73	58	73
23	72	92	92	90	76	84
24	45	52	50			46

TABLE 82, continued

(Trials 1-24 by Trials 19-24)

APOMORPHINE						
TRIAL						
	19	20	21	22	23	24
1						
2						
3						
4						
5						
6						
7	78	59	64	58	<u>56</u>	
8	<u>52</u>			69	<u>64</u>	72
9	<u>63</u>			74	76	58
10			<u>53</u>			
11				61	<u>56</u>	<u>67</u>
12			<u>51</u>			
13	69			69	72	<u>45</u>
14	73	58	65	83	92	<u>52</u>
15	73	57	62	82	92	<u>50</u>
16	60	57	71	73	90	
17	<u>48</u>	66	81	58	76	
18	<u>57</u>	59	65	74	84	<u>46</u>
19		82	76	91	78	63
20	82		93	77	76	
21	76	93		71	79	
22	91	77	-71		90	80
23	78	76	79	90		<u>53</u>
24	63			80	<u>53</u>	

TABLE 83

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of GROOM for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
21						
22						
23						
24						

$\bar{r} = \bar{XX}$: $p < .05$
 $\bar{r} = \bar{XX}$: $p < .01$

TABLE 83, continued
 (Trials 1-24 by Trials 7-12)

SALINE						
TRIAL						
	7	8	9	10	11	12
1						
2						
3						
4						
5						
6						
7				84		
8						
9						
10	84					
11						
12						
13						
14						
15				85		
16						<u>76</u>
17	<u>79</u>			93		
18						
19	<u>76</u>					
20						
21						
22						<u>-76</u>
23						
24						

TABLE 83, continued

(Trials 1-24 by Trials 13-18)

SALINE						
TRIAL						
	13	14	15	16	17	18
1						
2						
3						
4						
5						
6						
7					<u>72</u>	
8						
9						
10			85		93	
11						
12				<u>76</u>		
13						
14			<u>76</u>			
15		<u>76</u>			80	
16						
17			80			
18						
19						
20						
21						
22						<u>70</u>
23						<u>83</u>
24		<u>67</u>				

TABLE 83, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24
1						
2						<u>-67</u>
3						
4						
5						
6			<u>67</u>			
7	<u>76</u>					
8						
9						
10						
11						
12			<u>-76</u>			
13						
14						<u>67</u>
15						
16						
17						
18				<u>70</u>	83	
19					<u>68</u>	
20						87
21						
22					<u>67</u>	<u>68</u>
23	<u>68</u>			<u>67</u>		<u>76</u>
24		87		<u>68</u>	<u>76</u>	

TABLE 84

Trial By Trial Significant Correlation Coefficients ($\bar{r} \times 100$)
 of INACTIVE for the Dependent Measure Event Count
 (Trials 1-24 by Trials 1-6)

SALINE						
TRIAL						
	1	2	3	4	5	6
1						
2				$\frac{77}{77}$	$\frac{80}{80}$	
3						
4		$\frac{77}{80}$	$\frac{77}{80}$			
5						
6						
7		99	99	$\frac{77}{77}$	$\frac{80}{80}$	
8		99	99	$\frac{77}{77}$	$\frac{80}{80}$	
9		96	96	$\frac{71}{71}$	$\frac{80}{80}$	
10						
11						
12						
13						
14					83	
15						
16				81		
17						
18						
19		99	99	$\frac{77}{77}$	$\frac{80}{80}$	
20		83	83		$\frac{91}{91}$	
21						
22						
23						
24						

$\bar{r} = \text{XX}$: $p < .05$
 $\bar{r} = \text{XX}$: $p < .01$

TABLE 84, continued
(Trials 1-24 by Trials 7-12)

	SALINE					
	TRIAL					
	7	8	9	10	11	12
1						
2	99	99	96			
3	99	99	96			
4	<u>77</u>	<u>77</u>	<u>71</u>			
5	<u>80</u>	<u>80</u>	<u>80</u>			
6						
7			96			
8			96			
9	96	96				
10						
11						
12						
13						
14				<u>76</u>		
15				<u>73</u>		
16						
17						
18						
19	99	99	96			
20	83	83	<u>76</u>			
21				<u>67</u>		
22						
23						
24					<u>78</u>	<u>70</u>

TABLE 84, continued

(Trials 1-24 by Trials 13-18)

	SALINE					
	TRIAL					
	13	14	15	16	17	18
1						
2						
3						
4				81		
5		84				
6						
7						
8						
9						
10		<u>76</u>	<u>73</u>			
11						
12						
13						
14						
15						
16						
17						
18						
19						
20		89				
21						
22						
23						
24						

TABLE 84, continued

(Trials 1-24 by Trials 19-24)

SALINE						
TRIAL						
	19	20	21	22	23	24'
1						
2	99	83				
3	99	83				
4	<u>77</u>					
5	<u>80</u>	91				
6						
7	99	83				
8	99	83				
9	96	<u>76</u>				
10			<u>67</u>			
11						<u>78</u>
12						<u>70</u>
13						
14		89				
15						
16						
17						
18						
19		83				
20	83					
21						
22						
23						
24						

TABLE 85

ANOVA Table for LOCOMOTE (Event Duration)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
G (group)	1	651.19	27.92	.001
Sw (subject)	14	23.32		
T (trial)	23	23.22	8.73	.001
G X T	23	4.82	1.81	.014
TSw	322	2.66		

NOTE: Group 1 = High Locomote
Group 2 = Low Locomote

TABLE 86

ANOVA Table for REAR (Event Duration)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
G (group)	1	649.45	2.22	ns
Sw (subject)	14	292.16		
T (trial)	23	36.14	4.36	.001
G X T	23	22.47	2.71	.001
TSw	322	8.29		

TABLE 87

ANOVA Table for SNIFF (Event Duration)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
G (group)	1	884.53	6.57	.022
Sw (subject)	14	134.55		
T (trial)	23	25.01	3.97	.001
G X T	23	17.83	2.83	.001
TSw	322	6.29		

NOTE: Group 1 = High Locomote
Group 2 = Low Locomote

TABLE 88

ANOVA Table for GNAW (Event Duration)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
G (group)	1	1369.67	9.49	.008
Sw (subject)	14	144.38		
T (trial)	23	47.44	6.48	.001
G X T	23	41.87	5.72	.001
TSw	322	7.32		

TABLE 89

ANOVA Table for NOD (Event Duration)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
G (group)	1	9.62	.41	ns
Sw (subject)	14	23.39		
T (trial)	23	60.58	8.77	.001
G X T	23	8.36	1.21	ns
TSw	322	6.91		

NOTE: Group 1 = High Locomote
Group 2 = Low Locomote

TABLE 90

ANOVA Table for HEADDOWN (Event Duration)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
G (group)	1	1.09	5.61	.033
Sw (subject)	14	.19		
T (trial)	23	.28	2.58	.001
G X T	23	.25	2.32	.001
TSw	322	.11		

TABLE 91

ANOVA Table for LOCOMOTE (Event Count)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
G (group)	1	107501.50	33.69	.001
Sw (subject)	14	3191.08		
T (trial)	23	3316.22	7.94	.001
G X T	23	1069.24	2.56	.001
TSw	322	417.84		

NOTE: Group 1 = High Locomote
Group 2 = Low Locomote

TABLE 92

ANOVA Table for REAR (Event Count)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
G (group)	1	12.04	.06	ns
Sw (subject)	14	209.04		
T (trial)	23	36.21	2.88	.001
G X T	23	9.05	.72	ns
TSw	322	12.57		

TABLE 93

ANOVA Table for SNIFF (Event Count)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
G (group)	1	86851.00	56.40	.001
Sw (subject)	14	1539.87		
T (trial)	23	958.70	6.35	.001
G X T	23	395.78	2.62	.001
TSw	322	150.98		

NOTE: Group 1 = High Locomote
Group 2 = Low Locomote

TABLE 94

ANOVA Table for GNAW (Event Count)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
G (group)	1	3185.51	7.81	.014
Sw (subject)	14	407.97		
T (trial)	23	131.07	6.35	.001
G X T	23	121.54	5.89	.001
TSw	322	20.63		

TABLE 95

ANOVA Table for NOD (Event Count)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
G (group)	1	10.01	.10	ns
Sw (subject)	14	94.71		
T (trial)	23	206.79	7.41	.001
G X T	23	44.92	1.61	.040
TSw	322	27.93		

NOTE: Group 1 = High Locomote
Group 2 = Low Locomote

TABLE 96

ANOVA Table for HEADDOWN (Event Count)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>P</u>
G (group)	1	1.26	1.52	ns
Sw (subject)	14	.83		
T (trial)	23	1.36	3.90	.001
G X T	23	.80	2.28	.001
TSw	322	.35		

TABLE 97

ANOVA Table for JUMP (Event Count)
HIGH versus LOW LOCOMOTE - APOMORPHINE

Source	<u>df</u>	<u>MS</u>	<u>F</u>	<u>p</u>
G (group)	1	14.26	.26	ns
Sw (subject)	14	53.92		
T (trial)	23	16.40	3.99	.001
G X T	23	2.32	.56	ns
TSw	322	4.11		

NOTE: Group 1 = High Locomote
Group 2 = Low Locomote

TABLE 98

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for LOCOMOTE (Event Duration)

Trial	<u>t</u>	<u>p</u>
1	5.46(1,14)	.035
2	8.14(1,14)	.013
3	19.89(1,14)	.001
4	21.37(1,14)	.001
5	5.95(1,14)	.029
6	10.51(1,14)	.006
7	9.67(1,14)	.008
8	15.24(1,14)	.002
9	16.90(1,14)	.001
10	14.36(1,14)	.002
11	.67	ns
12	.50	ns
13	3.73	ns
14	14.22(1,14)	.002
15	13.32(1,14)	.003
16	2.75	ns
17	4.05	ns
18	3.45	ns
19	5.55(1,14)	.034
20	12.08(1,14)	.004
21	22.07(1,14)	.001
22	23.99(1,14)	.001
23	12.05(1,14)	.004
24	.80	ns

TABLE 99

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for REAR (Event Duration)

Trial	<u>t</u>	<u>p</u>
1	.25	ns
2	.01	ns
3	.11	ns
4	.29	ns
5	1.34	ns
6	2.25	ns
7	2.31	ns
8	3.01	ns
9	1.26	ns
10	.09	ns
11	1.20	ns
12	1.45	ns
13	2.64	ns
14	2.79	ns
15	3.23	ns
16	1.94	ns
17	.96	ns
18	2.25	ns
19	1.96	ns
20	3.15	ns
21	4.00	ns
22	5.08(1,14)	.041
23	3.13	ns
24	2.83	ns

TABLE 100

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for SNIFF (Event Duration)

Trial	t	p
1	.03	ns
2	2.02	ns
3	6.41(1,14)	.024
4	11.95(1,14)	.004
5	9.10(1,14)	.009
6	49.94(1,14)	.001
7	.00	ns
8	1.08	ns
9	4.22	ns
10	5.31(1,14)	.037
11	4.93(1,14)	.043
12	2.16	ns
13	.04	ns
14	.12	ns
15	1.84	ns
16	5.48(1,14)	.035
17	4.30	ns
18	6.78(1,14)	.021
19	.11	ns
20	.60	ns
21	1.66	ns
22	3.44	ns
23	5.29(1,14)	.037
24	3.15	ns

TABLE 101

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for GNAW (Event Duration)

Trial	<u>t</u>	<u>p</u>
1	2.07	ns
2	4.31	ns
3	9.06(1,14)	.009
4	15.71(1,14)	.001
5	9.20(1,14)	.009
6	14.18(1,14)	.002
7	1.00	ns
8	1.63	ns
9	4.95(1,14)	.043
10	6.36(1,14)	.024
11	7.42(1,14)	.016
12	3.93	ns
13	1.00	ns
14	1.00	ns
15	1.32	ns
16	6.29(1,14)	.025
17	5.78(1,14)	.031
18	3.72	ns
19	.00	ns
20	.00	ns
21	3.30	ns
22	1.26	ns
23	3.32	ns
24	5.90(1,14)	.029

TABLE 102

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for NOD (Event Duration)

Trial	t	p
1	1.50	ns
2	7.58(1,14)	.016
3	1.76	ns
4	.00	ns
5	.03	ns
6	.32	ns
7	2.16	ns
8	2.04	ns
9	.06	ns
10	.42	ns
11	3.06	ns
12	.12	ns
13	.00	ns
14	2.32	ns
15	2.32	ns
16	.00	ns
17	.84	ns
18	.00	ns
19	.00	ns
20	1.39	ns
21	.72	ns
22	.58	ns
23	1.98	ns
24	.09	ns

TABLE 103

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for HEADDOWN (Event Duration)

Trial	<u>t</u>	<u>p</u>
1	2.72	ns
2	1.00	ns
3	.83	ns
4	.00	ns
5	.00	ns
6	1.00	ns
7	.02	ns
8	1.00	ns
9	.00	ns
10	.00	ns
11	.00	ns
12	.00	ns
13	8.27(1,14)	.012
14	.24	ns
15	1.00	ns
16	.00	ns
17	.00	ns
18	.00	ns
19	1.25	ns
20	.00	ns
21	.00	ns
22	.00	ns
23	1.00	ns
24	2.33	ns

TABLE 104

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for LOCOMOTE (Event Count)

Trial	t	p
1	1.09	ns
2	9.75(1,14)	.008
3	23.52(1,14)	.001
4	39.99(1,14)	.001
5	3.50	ns
6	21.73(1,14)	.001
7	5.87(1,14)	.030
8	16.84(1,14)	.001
9	8.24(1,14)	.012
10	15.23(1,14)	.002
11	3.05	ns
12	1.49	ns
13	7.80	.014
14	17.13(1,14)	.001
15	24.21(1,14)	.001
16	4.20	ns
17	4.13	ns
18	8.46(1,14)	.011
19	4.04	ns
20	16.59(1,14)	.001
21	31.63(1,14)	.001
22	43.11(1,14)	.001
23	15.24(1,14)	.002
24	3.70	ns

TABLE 105

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for SNIFF (Event Count)

Trial	t	p
1	4.36	ns
2	10.94(1,14)	.005
3	23.24(1,14)	.001
4	10.36(1,14)	.006
5	12.51(1,14)	.003
6	39.40(1,14)	.001
7	9.97(1,14)	.007
8	37.71(1,14)	.001
9	42.45(1,14)	.001
10	22.50(1,14)	.001
11	11.09(1,14)	.005
12	2.53	ns
13	18.50(1,14)	.001
14	24.84(1,14)	.001
15	34.17(1,14)	.001
16	16.85(1,14)	.001
17	12.98(1,14)	.003
18	13.62(1,14)	.002
19	5.90(1,14)	.029
20	21.42(1,14)	.001
21	40.78(1,14)	.001
22	50.08(1,14)	.001
23	22.34(1,14)	.001
24	7.75(1,14)	.015

TABLE 106

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for GNAW (Event Count)

Trial	t	p
1	2.33	ns
2	3.47	ns
3	7.89(1,14)	.014
4	13.72(1,14)	.002
5	8.17(1,14)	.013
6	12.94(1,14)	.003
7	1.00	ns
8	1.26	ns
9	4.37	ns
10	4.69(1,14)	.048
11	6.90(1,14)	.020
12	4.11	ns
13	1.00	ns
14	1.00	ns
15	1.21	ns
16	4.51	ns
17	4.68(1,14)	.048
18	3.63	ns
19	.00	ns
20	.00	ns
21	2.80	ns
22	1.00	ns
23	2.23	ns
24	4.31	ns

TABLE 107

t-TESTS Between HIGH and LOW LOCOMOTE Groups on
Each Trial for NOD (Event Count)

Trial	<u>t</u>	<u>p</u>
1	1.96	ns
2	8.11(1,14)	.013
3	.08	ns
4	1.02	ns
5	.21	ns
6	.23	ns
7	1.75	ns
8	1.91	ns
9	.41	ns
10	1.60	ns
11	4.28	ns
12	.00	ns
13	.00	ns
14	1.58	ns
15	1.39	ns
16	.15	ns
17	1.07	ns
18	.05	ns
19	.00	ns
20	1.00	ns
21	1.07	ns
22	.34	ns
23	.08	ns
24	.31	ns

TABLE 108

Group Means(SEM) (Event Duration)

Behavior	Group	
	High Locomote	Low Locomote
LOCOMOTE	8.75(.20)	6.15(.15)
REAR	2.51(.62)	5.11(.43)
SNIFF	15.57(.15)	12.54(.14)
GNAW	1.13(.04)	4.90(.41)
NOD	2.75(.22)	3.06(.27)
HEADDOWN	1.14(.29)	1.03(.14)

TABLE 109

Group Means(SEM) (Event Count)

Behavior	Group	
	High Locomote	Low Locomote
LOCOMOTE	61.3(2.5)	27.8(1.5)
REAR	2.2(.4)	2.6(.3)
SNIFF	54.5(1.3)	29.4(1.2)
GNAW	.2(.1)	5.9(.7)
NOD	3.6(.5)	3.2(.6)
HEADDOWN	.2(.1)	.1(.1)
JUMP	.8(.2)	1.2(.2)

TABLE 110

Trial Means(SEM) of LOCOMOTE (Event Duration)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	9.27(.66)	7.29(.53)
2	9.44(.66)	7.12(.48)
3	9.43(.60)	6.13(.43)
4	8.55(.34)	5.96(.45)
5	7.67(.46)	5.65(.53)
6	6.94(.45)	4.53(.59)
7	10.41(.57)	7.73(.65)
8	10.06(.57)	6.90(.57)
9	9.28(.40)	6.69(.49)
10	8.76(.34)	6.56(.47)
11	6.92(1.07)	6.00(.33)
12	5.56(.74)	4.96(.40)
13	11.55(.56)	8.79(1.31)
14	10.70(.35)	6.51(1.05)
15	9.47(.15)	5.96(.95)
16	8.27(.47)	6.33(1.07)
17	7.64(.37)	5.70(.88)
18	6.96(.69)	5.44(.46)
19	10.22(.97)	7.10(.90)
20	10.46(.78)	6.33(.89)
21	9.19(.57)	5.04(.67)
22	9.42(.41)	4.68(.87)
23	8.30(.34)	5.04(.87)
24	5.85(.62)	5.04(.66)

TABLE 111

Trial Means(SEM) of REAR (Event Duration)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	2.48(1.30)	2.23(1.20)
2	2.38(.97)	2.55(1.32)
3	2.49(1.16)	1.99(.98)
4	2.27(1.27)	1.54(.54)
5	2.80(1.55)	1.00(.00)
6	2.28(.85)	1.00(.00)
7	2.20(1.20)	5.77(2.02)
8	2.20(.95)	6.30(2.17)
9	2.51(1.23)	5.42(2.27)
10	2.48(1.07)	2.97(1.19)
11	1.66(.44)	3.64(1.75)
12	1.07(.07)	2.56(1.24)
13	3.12(1.22)	7.14(2.14)
14	3.02(1.34)	1.13(2.07)
15	2.57(1.13)	2.26(2.35)
16	2.75(1.32)	6.51(2.36)
17	1.56(.44)	3.77(2.22)
18	2.01(.64)	5.38(2.18)
19	3.88(1.74)	7.60(2.00)
20	3.14(1.13)	7.87(2.41)
21	3.36(1.31)	8.76(2.36)
22	2.45(.61)	8.92(2.80)
23	3.23(1.02)	8.70(2.91)
24	2.29(.77)	6.66(2.48)

TABLE 112

Trial Means(SEM) of SNIFF (Event Duration)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	15.80(.41)	15.94(.65)
2	15.63(.57)	14.18(.83)
3	14.48(.73)	10.61(1.35)
4	14.30(1.01)	8.06(1.49)
5	14.19(1.31)	8.32(1.44)
6	15.97(.58)	7.91(.98)
7	15.25(.63)	15.24(.76)
8	15.65(.52)	14.35(1.14)
9	15.83(.52)	12.77(1.39)
10	15.78(.59)	12.22(1.43)
11	15.26(.91)	11.99(1.16)
12	16.73(.70)	14.76(1.15)
13	14.05(.72)	13.78(1.22)
14	14.92(.53)	14.43(1.32)
15	16.02(.39)	13.31(1.96)
16	16.18(.58)	11.61(1.86)
17	17.02(.22)	12.98(1.93)
18	17.22(.26)	13.36(1.46)
19	14.27(1.35)	13.63(1.58)
20	14.97(.70)	13.17(2.22)
21	15.76(.51)	12.92(2.15)
22	16.04(.23)	11.73(2.31)
23	16.18(.32)	11.00(2.23)
24	16.24(.87)	12.61(1.85)

TABLE 113

Trial Means(SEM) of GNAW (Event Duration)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	1.00(.00)	1.86(.60)
2	1.22(.22)	3.82(1.23)
3	1.66(.56)	9.20(2.44)
4	1.50(.33)	11.31(2.45)
5	1.00(.00)	9.48(2.80)
6	1.19(.19)	11.14(2.64)
7	1.03(.03)	1.00(.00)
8	1.09(.09)	2.08(.77)
9	1.19(.19)	5.99(2.39)
10	1.29(.29)	8.16(2.71)
11	1.15(.15)	8.53(2.70)
12	1.00(.00)	5.44(2.24)
13	1.07(.07)	1.00(.00)
14	1.00(.00)	1.76(.76)
15	1.00(.00)	2.60(1.39)
16	1.00(.00)	6.10(2.03)
17	1.24(.20)	6.49(2.18)
18	1.20(.17)	5.51(2.23)
19	1.00(.00)	1.00(.00)
20	1.00(.00)	1.00(.00)
21	1.00(.00)	2.64(.90)
22	1.20(.18)	2.34(1.00)
23	1.00(.00)	3.97(1.63)
24	1.00(.00)	5.26(1.76)

TABLE 114

Trial Means(SEM) of NOD (Event Duration)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	1.56(.43)	3.63(1.63)
2	2.76(.81)	6.99(1.30)
3	3.57(1.20)	6.32(1.69)
4	6.12(1.74)	6.36(2.00)
5	6.80(1.84)	7.27(2.30)
6	6.25(.95)	7.69(2.38)
7	1.00(.00)	1.25(.17)
8	1.22(.16)	2.74(1.05)
9	1.79(.45)	1.64(.60)
10	3.29(.92)	2.32(1.18)
11	6.30(1.70)	2.82(1.04)
12	4.50(1.15)	4.98(.83)
13	1.00(.00)	1.00(.00)
14	1.00(.00)	1.27(.18)
15	1.00(.00)	1.71(.46)
16	2.40(.62)	2.35(.55)
17	2.78(.43)	2.16(.53)
18	2.61(.41)	2.64(.81)
19	1.00(.00)	1.00(.00)
20	1.06(.05)	1.00(.00)
21	1.18(.10)	1.55(.43)
22	1.90(.53)	1.43(.33)
23	2.78(.71)	1.62(.42)
24	1.97(.51)	1.74(.60)

TABLE 115

Trial Means(SEM) of HEADDOWN (Event Duration)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	1.51(.31)	1.00(.00)
2	1.00(.00)	1.15(.15)
3	1.31(.31)	1.03(.03)
4	1.00(.00)	1.00(.00)
5	1.00(.00)	1.00(.00)
6	1.11(.11)	1.00(.00)
7	1.35(.35)	1.29(.20)
8	1.11(.11)	1.00(.00)
9	1.00(.00)	1.00(.00)
10	1.00(.00)	1.00(.00)
11	1.00(.00)	1.00(.00)
12	1.00(.00)	1.04(.03)
13	2.09(.62)	1.00(.00)
14	1.08(.08)	1.04(.04)
15	1.00(.00)	1.07(.10)
16	1.00(.00)	1.00(.00)
17	1.00(.00)	1.00(.00)
18	1.00(.00)	1.00(.00)
19	1.25(.15)	1.07(.07)
20	1.00(.00)	1.00(.00)
21	1.00(.00)	1.00(.00)
22	1.00(.00)	1.00(.00)
23	1.28(.28)	1.00(.00)
24	1.15(.10)	1.00(.00)

TABLE 116

Trial Means(SEM) of LOCOMOTE (Event Count)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	44.6(5.1)	36.8(5.5)
2	53.6(7.4)	28.4(3.2)
3	50.9(6.1)	20.4(1.4)
4	46.6(4.4)	17.1(1.5)
5	38.9(6.3)	22.9(5.8)
6	31.3(4.1)	10.8(1.7)
7	63.6(7.3)	40.3(6.3)
8	67.6(8.9)	28.5(3.4)
9	75.9(16.2)	28.5(3.2)
10	62.6(6.2)	30.5(5.4)
11	59.6(18.0)	26.0(6.9)
12	24.8(5.3)	16.8(3.8)
13	110.3(15.7)	49.6(15.0)
14	88.9(8.3)	35.4(9.9)
15	72.6(5.4)	28.1(7.3)
16	56.0(4.9)	33.1(10.0)
17	47.9(4.8)	27.8(8.7)
18	45.1(6.8)	22.4(3.8)
19	83.8(17.7)	41.4(10.5)
20	104.3(13.6)	38.9(8.5)
21	71.4(8.1)	20.9(3.9)
22	74.8(6.7)	17.9(5.5)
23	60.9(7.4)	24.1(5.8)
24	35.9(6.3)	21.3(4.3)

TABLE 117

Trial Means(SEM) of REAR (Event Count)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	2.1(2.0)	1.0(.9)
2	2.9(2.5)	1.3(1.1)
3	2.5(1.8)	1.8(1.8)
4	2.4(2.4)	.9(.9)
5	1.1(.9)	.0
6	.8(.4)	.0
7	2.4(2.4)	3.5(1.8)
8	2.5(1.9)	4.5(2.2)
9	1.9(1.3)	2.5(1.3)
10	2.9(1.9)	1.0(.6)
11	1.4(.9)	1.1(.7)
12	.1(.1)	.5(.3)
13	5.5(3.7)	5.0(1.3)
14	5.9(4.5)	4.3(1.1)
15	1.3(1.0)	2.9(1.1)
16	.9(.7)	1.8(.7)
17	.1(.1)	1.4(.9)
18	.3(.2)	1.6(.8)
19	3.4(1.9)	7.1(1.9)
20	3.4(2.1)	5.8(1.8)
21	2.9(2.0)	3.9(1.4)
22	1.9(1.2)	4.3(1.5)
23	1.8(.8)	2.8(1.0)
24	2.8(2.0)	2.6(1.0)

TABLE 118

Trial Means(SEM) of SNIFF (Event Count)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	56.3(5.0)	42.6(4.2)
2	59.3(6.0)	36.6(3.3)
3	54.0(3.6)	26.9(4.3)
4	46.3(7.8)	19.4(3.0)
5	44.3(6.1)	18.4(4.0)
6	44.1(2.3)	19.9(3.1)
7	62.9(2.4)	39.0(7.2)
8	68.3(4.7)	32.4(3.4)
9	67.3(4.1)	33.0(3.3)
10	67.6(4.8)	33.3(5.4)
11	57.5(5.2)	32.1(5.6)
12	36.6(5.1)	26.6(3.6)
13	80.0(5.2)	42.1(7.1)
14	75.6(5.3)	32.9(6.8)
15	73.4(4.6)	28.3(6.2)
16	58.1(3.5)	29.6(6.0)
17	56.6(3.6)	28.9(6.8)
18	54.0(6.1)	27.3(3.9)
19	57.1(5.3)	34.6(7.6)
20	67.1(3.5)	33.3(6.4)
21	65.0(5.1)	22.3(4.3)
22	70.8(5.1)	19.1(5.3)
23	60.0(6.0)	21.4(5.6)
24	45.8(5.1)	26.1(4.9)

TABLE 119

Trial Means(SEM) of GNAW (Event Count)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	.0	.5(.3)
2	.4(.4)	2.9(1.0)
3	.8(.6)	14.9(5.0)
4	.5(.4)	17.3(4.5)
5	.0	13.3(4.6)
6	.1(.1)	15.8(4.3)
7	.1(.1)	.0
8	.1(.1)	1.3(1.0)
9	.4(.4)	7.8(3.5)
10	.4(.4)	9.9(4.4)
11	.1(.1)	10.9(4.1)
12	.0	5.9(2.9)
13	.1(.1)	.0
14	.0	.8(.7)
15	.0	1.5(1.4)
16	.0	9.1(4.3)
17	.1(.1)	9.5(4.3)
18	.4(.4)	8.8(4.4)
19	.0	.0
20	.0	.0
21	.0	1.4(.8)
22	.3(.2)	1.9(1.6)
23	.0	3.1(2.1)
24	.0	5.9(2.8)

TABLE 120

Trial Means(SEM) of NOD (Event Count)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	.5(.4)	3.9(2.4)
2	2.8(1.4)	11.3(2.6)
3	7.2(3.5)	8.5(2.5)
4	13.6(5.1)	7.6(3.0)
5	12.0(4.4)	9.4(3.7)
6	10.6(2.4)	8.5(3.7)
7	.0	.5(.4)
8	.4(.3)	3.0(1.9)
9	1.8(1.0)	1.0(.6)
10	6.0(2.4)	2.1(1.8)
11	12.8(4.5)	2.8(1.7)
12	5.8(2.3)	5.8(1.7)
13	.0	.0
14	.0	.6(.5)
15	.0	.9(.7)
16	1.4(.7)	1.8(.7)
17	2.9(1.2)	1.5(.6)
18	2.9(1.1)	3.4(2.1)
19	.0	.0
20	.1(.1)	.0
21	.3(.2)	.9(.6)
22	1.0(1.0)	.4(.4)
23	2.4(1.5)	1.9(1.0)
24	1.1(.9)	2.1(1.6)

TABLE 121

Trial Means(SEM) of HEADDOWN (Event Count)
(collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	.6(.4)	.0
2	.0	.1(.1)
3	.6(.6)	.1(.1)
4	.0	.0
5	.0	.0
6	.1(.1)	.0
7	.1(.1)	.5(.3)
8	.1(.1)	.0
9	.0	.0
10	.0	.0
11	.0	.0
12	.0	.1(.1)
13	2.3(.8)	.4(.4)
14	.1(.1)	.1(.1)
15	.0	.1(.1)
16	.0	.0
17	.0	.0
18	.0	.0
19	.4(.3)	.8(.6)
20	.0	.0
21	.0	.0
22	.0	.0
23	.6(.4)	.0
24	.0	.0

TABLE 122

Trial Means(SEM) of JUMP (Event Count)
 (collapsed across sessions) - APOMORPHINE

Trial	Group	
	High Locomote	Low Locomote
1	.4(.3)	.0
2	.0	.1(.1)
3	.5(.4)	.0
4	.4(.4)	.0
5	.3(.2)	.3(.2)
6	.4(.3)	.0
7	.3(.2)	1.7(.5)
8	.5(.5)	1.1(.9)
9	.9(.4)	.8(.5)
10	.5(.4)	.3(.2)
11	.3(.2)	.6(.4)
12	.1(.1)	.3(.2)
13	1.8(.8)	1.8(1.0)
14	1.3(.8)	1.9(1.1)
15	.0	1.8(1.1)
16	.8(.6)	1.9(1.2)
17	.5(.4)	1.4(1.1)
18	.0	1.1(.7)
19	3.0(2.2)	5.8(2.6)
20	2.6(1.7)	2.4(1.7)
21	2.0(1.1)	2.1(1.4)
22	1.9(1.1)	2.8(1.4)
23	1.4(.6)	1.5(1.0)
24	.8(.5)	1.3(.8)

TABLE 123

Values of T for Pretest/Posttest Reactivity
to Four Stimuli Across Sessions (Wilcoxon
Matched-Pairs Signed Ranks Test)

APOMORPHINE:

Session	Stimuli			
	Poke	Brush	Noise	Lift
1	35(N=12)	17(N=9)	11(N=9)	36(N=12)
2	67(N=14)	6(N=3)	0(N=4)	7(N=9)
3	13(N=7)	5(N=6)	23(N=9)	2(N=3)
4	8(N=5)	3(N=5)	5(N=9)*	3(N=6)

*p < .05

TABLE 124

Values of T for Pretest/Posttest Reactivity
to Four Stimuli Across Sessions (Wilcoxon
Matched-Pairs Signed Ranks Test)

SALINE:

Session	Stimuli			
	Poke	Brush	Noise	Lift
1	13(N=7)	0(N=8)*	0(N=6)	6(N=6)
2	2(N=2)	0(N=1)	0(N=6)*	4(N=5)
3	1(N=1)	0(N=0)	2(N=3)	1(N=2)
4	3(N=2)	0(N=0)	0(N=2)	7(N=5)

*p < .05

TABLE 125

Values of U for Apomorphine Versus
Saline Group Reactivity to Four
Stimuli Across Sessions - PRETEST
(Mann-Whitney U-Test)

Session	Stimuli			
	Poke	Brush	Noise	Lift
1	78(m=23) (n=10)	33(m=20)* (n=11)	139(m=24) (n= 9)	165(m=40)* (n=19)
2	53(m=21) (n= 9)	91(m=21) (n= 9)	87(m=20) (n= 9)	98(m=25) (n=12)
3	69(m=20) (n= 8)	72(m=20) (n= 8)	34(m=21)* (n= 8)	50(m=28)* (n= 8)
4	84(m=19) (n= 9)	72(m=19) (n= 9)	89(m=20) (n= 9)	101(m=24) (n=10)

*p < .05

TABLE 126

Values of U for Apomorphine Versus
Saline Group Reactivity to Four
Stimuli Across Sessions - POSTTEST
(Mann-Whitney U-Test)

Session	Stimuli			
	Poke	Brush	Noise	Lift
1	128(m=21) (n= 9)	84(m=20) (n= 9)	96(m=21) (n= 9)	180(m=34) (n=15)
2	89(m=21) (n= 9)	85(m=20) (n= 9)	37(m=21)* (n= 9)	153(m=26) (n=11)
3	67(m=19) (n= 8)	67(m=19) (n= 8)	62(m=19) (n= 8)	53(m=24) (n= 8)
4	104(m=17) (n= 9)	67(m=17) (n= 9)	59(m=17) (n= 9)	72(m=21) (n= 9)

*p < .05

TABLE 127

RELIABILITY
Agreement Matrix for Kappa Coefficient: INTERJUDGE

Behaviors ¹	Test 1					pi1 ²
	Q	W	G	T	Y	
Q	12		3			15/120=.125
W		5	3			8/120=.067
Test 2 G	3		68	2	2	75/120=.625
T				2		2/120=.017
Y			3		17	20/120=.167
pi2	.125	.042	.642	.033	.158	

$$Po = 104/120 = .867 \quad Pc = .447$$

$$Kappa = (.867 - .447) / (1 - .447) = .759$$

¹Q=Locomote
W=Rear
G=Sniff
T=Groom
Y=Inactive

²pi1=Proportions of total entries for test 1
pi2=Proportions of total entries for test 2

Po=Proportion of agreement
Pc=Proportion of chance agreement

TABLE 128

RELIABILITY
Agreement Matrix for Kappa Coefficient: TEST-RETEST

Behaviors ¹	Test 1						pi1 ²
	Q	W	G	T	Y	R	
Test 2	Q	8					8/120=.067
	W		4				4/120=.033
	G	2		84		1	87/120=.725
	T			1	2		3/120=.025
	Y					7	7/120=.058
	R	1		3		7	11/120=.092
	pi2	.092	.033	.733	.017	.067	.058

$$Po = 112/120 = .933 \quad Pc = .547$$

$$Kappa = (.933 - .547) / (1 - .547) = .852$$

¹Q=Locomote
W=Rear
G=Sniff
T=Groom
Y=Inactive
R=Turn

²pi1=Proportions of total entries for test 1
pi2=Proportions of total entries for test 2

Po=Proportion of agreement
Pc=Proportion of chance agreement