2007-01

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# Information for Users

In this document you will find information about the experiment 2007-01 in the catalog (see reference above) and information about the format of the data. A pdf version of this information is included in the downloaded data set for the archive of the manuscript in the catalog. The file is named “Info_2007-01.pdf”.

## Information about the experiments

In this section you will find Information about the method used in the experiments (same as in the manuscript), including a description of the subjects, the apparatus, and the procedure.

## Experiment 1: Methods

### Subjects

Twelve male Sprague Dawley rats with no previous experience were used in the experiment. The rats were housed individually in a colony room on a 12:12 light: dark cycle (lights off at 8:30 a.m.). Dim red lights provided illumination in the colony room and the testing room. The rats were fed a daily ration that consisted of 45-mg Noyes pellets (Improved Formula A) that were delivered during the experimental session, and an additional 15 g of FormuLab 5008 food given in the home cage after the daily sessions. Water was available ad libtum in both the home cages and experimental chambers. The rats arrived in the colony at 35 days of age and were 187 days of age when training begun.

### Apparatus

The 12 boxes (25 x 30 x 30 cm) were located inside ventilated, noise-attenuating enclosures (74 x 38 x 60 cm). Each box was equipped with a food cup and a water bottle. Three stimuli, referred to as “noise,” “light,” and “clicker,” were generated from modules from Med Associates, St. Albans, VT. The noise was a 70-dB white noise, with an onset rise time and termination fall time of 10 ms, that was generated by an audio amplifier (Model ANL-926). The light was a diffused houselight (Model ENV-227M) rated to illuminate the entire chamber over 200 Lux at a distance of 3 in. The clicker (Model ENV-135M) was a small relay mounted on the outside of the box that was used to produce an auditory click at a rate of 1 per second. A pellet dispenser (Model ENV-203) delivered 45-mg Noyes (Improved Formula A) pellets into the food cup on the front wall. Each head entry into the food cup was detected by a LED-photocell. A water bottle was mounted outside the box; water was available through a tube that protruded

through a hole in the back wall of the box. Two Gateway Pentium• III/ 500 computers running the Med-PC Medstate Notation Version 2.0 (Tatham & Zurn, 1989) controlled experimental events and recorded the time at which events occurred with 2-ms resolution.

## Procedure

The animals received training in the multiple cued interval procedure (Guilhardi & Church, 2005). A cycle in the multiple cued interval procedure consisted of a 20-s period in which the discriminative stimulus was off, followed by a fixed interval with the discriminative stimulus on. Food was primed at the end of this fixed interval. Immediately after the next head entry into the food cup (measured as the time of the breaking a photo beam in the food cup), food was delivered, the discriminative stimulus was turned off, and the next cycle began. The daily sessions were composed of 60 cycles. The experiment had four phases: Acquisition, extinction, reacquisition, and repeated acquisitions and extinctions.

*Acquisition*. In the first phase, all rats were trained for 30 sessions under 30-, 60-, and 120-s fixed-interval schedules of reinforcement differentially signaled by white noise, light, or clicker. The assignment of stimuli to intervals was counterbalanced across animals. One of the three possible intervals (30, 60, and 120 s) was presented randomly with equal probability on every cycle.

*Extinction*. In the second phase with 35 sessions, head-entry responses were not reinforced after one of the intervals, and the stimulus terminated after 30, 60, or 120 s (i.e., the time at which food would be available). The 12 rats were randomly partitioned into three groups of four rats. One randomly selected group had responses to the 30-s interval extinguished, another randomly selected group had responses to the 60-s interval extinguished, and the remaining group had responses to the 120-s interval extinguished. Thus, for each rat responses to one of the three intervals were extinguished, and the conditions of acquisition were maintained on the other two intervals. The stimuli to interval assignment was counterbalanced across groups and randomized when counterbalancing was not possible.

*Reacquisition*. In the third phase with 10 sessions, the conditions were identical to those in the acquisition phase for all rats.

*Repeated acquisitions and extinctions*. In the final phase with 45 sessions, there was extinction of responses to one of the three intervals as in the extinction phase. However, responses to a different interval, and therefore, to a different discriminative stimulus, were extinguished on every session. On the first session of this phase, one of the three intervals was randomly chosen with equal probability. For each one of the remaining sessions, one of the three intervals was randomly selected with equal probability with the restriction that the interval during which responses of head entry were extinguished did not repeat on two consecutive sessions.

### Assignment of Subjects to Conditions

Table 1 shows the assignment of rats to the extinguished fixed interval (FI 30, FI 60, or FI 120 s) during Extinction phase (Sessions 31 to 65).

Table 1.

| | Fixed Interval | | |
|---|---|---|---|
| | **FI 30** | **FI 60** | **FI 120** |
| **Rat** | 437 | 434 | 433 |
| | 440 | 435 | 438 |
| | 444 | 439 | 441 |
| | 445 | 443 | 442 |

Table 2 shows the fixed interval extinguished in every session during Repeated Acquisitions and Extinctions (Sessions 76 to 120) for each of the rats.

Table 2.

| | | Rats | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | **433** | **434** | **435** | **445** | **437** | **443** | **438** | **439** | **440** | **441** | **442** | **444** |
| **Sessions** | **76** | 60 | 60 | 30 | 120 | 30 | 120 | 60 | 120 | 120 | 120 | 30 | 60 |
| | **77** | 120 | 120 | 120 | 30 | 60 | 30 | 30 | 30 | 30 | 60 | 120 | 120 |
| | **78** | 60 | 60 | 30 | 120 | 120 | 120 | 60 | 60 | 60 | 30 | 60 | 30 |
| | **79** | 30 | 30 | 120 | 60 | 60 | 30 | 30 | 120 | 30 | 60 | 30 | 120 |
| | **80** | 60 | 120 | 60 | 30 | 30 | 120 | 120 | 30 | 120 | 120 | 60 | 60 |
| | **81** | 120 | 30 | 120 | 120 | 60 | 30 | 30 | 60 | 30 | 60 | 30 | 120 |
| | **82** | 60 | 60 | 60 | 30 | 30 | 60 | 120 | 30 | 60 | 120 | 120 | 60 |
| | **83** | 120 | 30 | 30 | 60 | 120 | 120 | 60 | 60 | 120 | 30 | 60 | 120 |
| | **84** | 30 | 60 | 120 | 120 | 60 | 30 | 120 | 30 | 30 | 120 | 120 | 60 |
| | **85** | 60 | 30 | 60 | 60 | 120 | 120 | 30 | 60 | 60 | 60 | 30 | 30 |
| | **86** | 30 | 60 | 30 | 30 | 60 | 60 | 120 | 30 | 120 | 120 | 60 | 120 |
| | **87** | 60 | 120 | 60 | 60 | 30 | 120 | 60 | 120 | 30 | 30 | 120 | 30 |
| | **88** | 120 | 60 | 30 | 120 | 120 | 30 | 30 | 30 | 60 | 120 | 30 | 60 |
| | **89** | 60 | 120 | 60 | 60 | 60 | 60 | 120 | 60 | 30 | 30 | 120 | 30 |
| | **90** | 120 | 60 | 120 | 120 | 120 | 30 | 60 | 30 | 120 | 120 | 60 | 60 |
| | **91** | 30 | 30 | 60 | 30 | 30 | 120 | 30 | 120 | 30 | 30 | 120 | 30 |
| | **92** | 60 | 60 | 120 | 120 | 60 | 30 | 120 | 30 | 120 | 120 | 30 | 60 |
| | **93** | 30 | 120 | 60 | 30 | 30 | 120 | 60 | 120 | 60 | 30 | 60 | 120 |
| | **94** | 120 | 30 | 30 | 60 | 120 | 30 | 30 | 60 | 30 | 120 | 120 | 30 |
| | **95** | 60 | 120 | 120 | 30 | 60 | 60 | 120 | 120 | 60 | 60 | 60 | 120 |
| | **96** | 120 | 30 | 30 | 120 | 120 | 30 | 60 | 30 | 30 | 30 | 120 | 30 |
| | **97** | 60 | 120 | 60 | 60 | 60 | 60 | 120 | 120 | 120 | 60 | 30 | 120 |
| | **98** | 120 | 30 | 120 | 30 | 120 | 120 | 30 | 60 | 60 | 30 | 60 | 60 |
| | **99** | 60 | 120 | 60 | 120 | 60 | 60 | 120 | 120 | 30 | 60 | 30 | 30 |
| | **100** | 120 | 30 | 30 | 60 | 30 | 120 | 30 | 60 | 60 | 30 | 120 | 60 |
| | **101** | 30 | 60 | 60 | 120 | 60 | 30 | 120 | 120 | 120 | 60 | 60 | 120 |
| | **102** | 120 | 120 | 120 | 60 | 120 | 120 | 30 | 60 | 60 | 30 | 30 | 60 |
| | **103** | 30 | 30 | 30 | 120 | 30 | 30 | 60 | 120 | 30 | 120 | 120 | 30 |
| | **104** | 60 | 120 | 60 | 60 | 120 | 60 | 120 | 60 | 60 | 30 | 60 | 60 |
| | **105** | 30 | 30 | 30 | 30 | 30 | 30 | 60 | 30 | 30 | 60 | 120 | 30 |
| | **106** | 120 | 120 | 60 | 60 | 120 | 120 | 30 | 120 | 60 | 120 | 30 | 120 |
| | **107** | 60 | 30 | 120 | 120 | 60 | 30 | 60 | 30 | 120 | 30 | 60 | 60 |
| | **108** | 30 | 120 | 30 | 60 | 120 | 60 | 120 | 60 | 60 | 60 | 30 | 30 |
| | **109** | 120 | 30 | 120 | 30 | 60 | 30 | 60 | 120 | 120 | 30 | 60 | 120 |
| | **110** | 60 | 120 | 60 | 120 | 30 | 120 | 30 | 30 | 30 | 60 | 120 | 30 |
| | **111** | 30 | 30 | 120 | 30 | 120 | 30 | 60 | 60 | 120 | 120 | 60 | 60 |
| | **112** | 120 | 60 | 60 | 120 | 30 | 120 | 30 | 30 | 60 | 60 | 120 | 30 |
| | **113** | 60 | 120 | 30 | 60 | 120 | 60 | 120 | 120 | 30 | 30 | 60 | 120 |
| | **114** | 120 | 30 | 60 | 120 | 30 | 30 | 60 | 60 | 120 | 60 | 30 | 30 |
| | **115** | 60 | 60 | 120 | 60 | 120 | 120 | 120 | 120 | 60 | 30 | 60 | 120 |
| | **116** | 120 | 120 | 60 | 30 | 60 | 60 | 60 | 30 | 120 | 120 | 30 | 30 |
| | **117** | 30 | 30 | 30 | 60 | 120 | 30 | 30 | 60 | 60 | 60 | 120 | 120 |
| | **118** | 120 | 60 | 120 | 30 | 30 | 60 | 60 | 30 | 30 | 30 | 30 | 30 |
| | **119** | 60 | 30 | 60 | 30 | 120 | 120 | 30 | 120 | 120 | 60 | 60 | 120 |
| | **120** | 30 | 120 | 30 | 60 | 30 | 60 | 120 | 30 | 30 | 120 | 120 | 60 |

*Notes on sessions and rats:*

1. Rat 445 had only 12 sessions of acquisition. Rat 445 replaced Rat 436 who died after 18 sessions and whose data are not available.

2.There was a problem during the recording of the times of events of the following rats and sessions: Rat 435 – Session 062; Rat 438 – Session 052; Rat 439 – Session 066; Rat 444 – Sessions 001 and 042. Although these data were not recorded, the session occurred as scheduled and events occurred as expected.

## Information about the format of the data

In this section you will find information about the format of the data including the file name conventions and the file format description, including the specific event codes used in this experiment.

## File name conventions and format

The original data from this experiment consist of a series of times of occurrence of events. Some of these are events controlled by the experimenter, such as the onset and termination of a stimulus; some of the events are controlled by the animal, such as the response; and some of them may depend upon both the experimenter and the animal, such as the delivery of a response-contingent reward.

In this experiment, the original data are represented as a list of time-event codes in the following standard format:

Each text file contains two tab-delimited columns:

Column 1 - contains the time of occurrence (in seconds)
Column 2 - contains a number representing the event

For example, a row in the file might contain “103.26 1” which would indicate that at 103.26 s after session onset a lever press response occurred.

There are 1,417 data files containing data of 120 sessions for each of the 12 rats. (See “Notes on sessions and rats” above.) The name of the files identify the experiment, condition, and session. The experiment is designated by two letters (EJ); the condition is designated by one digit (such as 1); the rat is designated by three digits (such as 433); and the session is designated by three digits (such as 008). The extension "txt" refers to the format in which the files were saved (ascii, double precision, with tab delimiters). Thus, the file named EJ1433008.txt refers to Experiment EJ, Condition 1, Rat 433, Session 8.

The experiment was: EJ
The conditions were: 1 (Acquisition), 2 (Extinction), 3 (Reacquisition), and 4 (Repeated Acquisitions and Extinction)
The rats were: 433 to 435, 445, 437 to 444.
The total 120 sessions were divided as follows : 1 to 30 Acquisition, 31 to 65 Extinction, 66 to 75 Reacquisition, and 76 to 120 for Repeated Acquisitions and Extinctions. (See methods for details.)

The original data from this experiment consists of a series of times of occurrence of events. Some of these are events controlled by the experimenter, such as the onset and termination of a stimulus; some of the events are controlled by the animal, such as a response; and some of them may depend upon both the experimenter and the animal, such as the delivery of a response-contingent reward.

## Event codes

Below is a list of the event codes that were used in this experiment (the most relevant event codes for this experiment are underlined):

Available responses:

| Events | Code |
|---|---|
| Left lever press | 1 |
| Left lever release | 2 |
| Right lever press | 3 |
| Right lever release | 4 |
| Left nose poke | 5 |
| Right nose poke | 6 |

| | |
|---|---|
| Lick response | 7 |
| Head-entry response | 8 |

Recorded Stimuli:

| **Events** | **Code** |
|---|---|
| White-noise on | 10 |
| Flashing lights on | 13 |
| Houselight on | 17 |
| Clicker on | 18 |
| Food pellet delivery on | 19 |
| Food Check | 9 |
| White-noise off | 20 |
| Flashing lights off | 23 |
| Houselight off | 27 |
| Clicker off | 28 |
| Food pellet delivery off | 29 |
| End of Session | 61 |

Additional recorded events:

| **Events** | **Code** |
|---|---|
| Beginning of a FI 30s cycle | 50 |
| Beginning of a FI 60s cycle or middle interval when varied | 51 |
| Beginning of a FI 120s cycle | 52 |
| Food Prime | 53 |

**Note:** The archive files can also be downloaded from the Psychonomic Society Archive of Norms, Stimuli, and Data Website:

http://www.psychonomic.org/archive