RESEARCH IN PROGRESS

PAUSING ON MULTIPLE SCHEDULES: TOWARD A LABORATORY MODEL OF ESCAPE-MOTIVATED BEHAVIOR

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An important role for the experimental analysis of human behavior is as a bridge between basic research and application. Traffic on the bridge can go both ways. In the human laboratory, basic behavioral processes uncovered in the animal laboratory can be translated to clinical populations, and clinical problems can be translated into basic behavioral processes.

Among the clinical problems that may benefit from experimental analysis are aberrant behaviors, such as self-injury and aggression, which frequently have an escape function in people with developmental disabilities. Iwata et al. (1994), for example, found that escape accounted for the largest proportion (38%) of 152 cases of destructive behaviors. Significantly, the stimuli that engender such behaviors often are seemingly benign events, such as requests to perform academic tasks (e.g., Carr & Newsom, 1985) or certain activities at particular times of the day (e.g., Charlop, Schreibman, Mason, & Vesey, 1983).

Several findings in the animal literature suggest that such events may be particularly aversive during transitions from favorable (rich) reinforcement conditions to less favorable (lean) ones. First, during postreinforcement pauses (PRPs), pigeons tend to move away from the schedule-correlated stimuli (e.g., Cohen & Campagnoni, 1989), suggesting that transitions from the presence to the absence of food may be aversive. Second, pigeons will peck a key that turns off stimuli correlated with a variety of food-reinforcement schedules (escape responses), particularly just after food has been presented (e.g., Azrin, 1961). Finally, on signaled schedules that alternate (multiple schedules), the longest PRPs and the highest frequencies of escape responses typically occur during the transitions from the richer to the leaner schedule component (e.g., Perone, 2003).

Although these and related studies show that stimuli correlated with rich-to-lean transitions are aversive to pigeons, there are no published data on whether or not such transitions also are aversive to people. This paper reports some preliminary results of an ongoing research program, the ultimate goal of which is to develop a laboratory model of variables that may operate in the natural environment to make otherwise neutral or positive situations aversive to individuals with mental retardation. Toward that end, we reinforced matching-to-sample (MTS) responses on a multiple schedule of monetary reinforcement consisting of rich and lean components. To enhance the potential effect, the lean component had both a relatively large response requirement and a relatively small reinforcer. Based on the aforementioned research with pigeons, we expected the longest PRPs to occur during the transitions from the rich to the lean component, and to see relatively undifferentiated pausing during the other three possible transition types.

METHOD

A man with mild mental retardation participated. He had no other diagnoses, and was not taking psychotropic medications. He sat facing a computer monitor fitted with a touch-sensitive membrane and recessed into a wooden partition. Coins were dispensed automatically

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into a plastic cup mounted to the lower right of the monitor.

A simultaneous, two-choice identity MTS procedure was used. Each trial began with the presentation of one of the two samples at the center of the screen. Touching the sample produced a 0.25-s feedback tone, followed by the presentation of the comparisons in two of the corners. Touching the matching comparison produced the 0.25-s feedback tone, whereas touching the non-matching comparison produced a buzz and a 3-s blackout. The intertrial interval was 0.1 s.

Matching responses were reinforced on a multiple fixed-ratio (FR) 10 FR 60 schedule. The latency to the first sample touch in each component was defined as the PRP. In the rich component, the screen color was red, the stimuli were black less-than and greater-than signs, and 10 matching responses produced a 1-s tone, a quarter, and a 3-s picture of a quarter. In the lean component, the background color was yellow, the stimuli were black, sideways U shapes that opened to the left or right, and 60 matching responses produced a different 1-s tone, along with a 3-s display of the numeral "1" in the center of the screen, indicating that 1 cent had been earned.

Sessions consisted of 41 components that alternated in an irregular fashion, such that 10 of each transition type occurred. That is, there were 10 transitions from rich to lean, 10 from rich to rich, 10 from lean to lean, and 10 from lean to rich. After each session, the subject was paid 1 cent for each lean component completed, and kept all quarters earned. Twenty sessions were conducted. Visual inspection of the mean PRPs from each transition type in the final five sessions indicated no upward or downward trends.

RESULTS AND DISCUSSION

Figure 1 shows means (top panel) and relative frequency distributions (bottom panel) of the PRPs during each transition type, calculated from the last five sessions of the study. Consistent with prior findings (e.g., Perone, 2003), the longest mean pause occurred when the past schedule was rich and the signaled upcoming schedule was lean, whereas the mean pauses in the other three transition types were low and quite similar to one another. This finding is explained by the frequency of PRPs equal to or greater than 19 s, which was considerably higher in the transitions from the rich to the lean component than in the other three transition types.

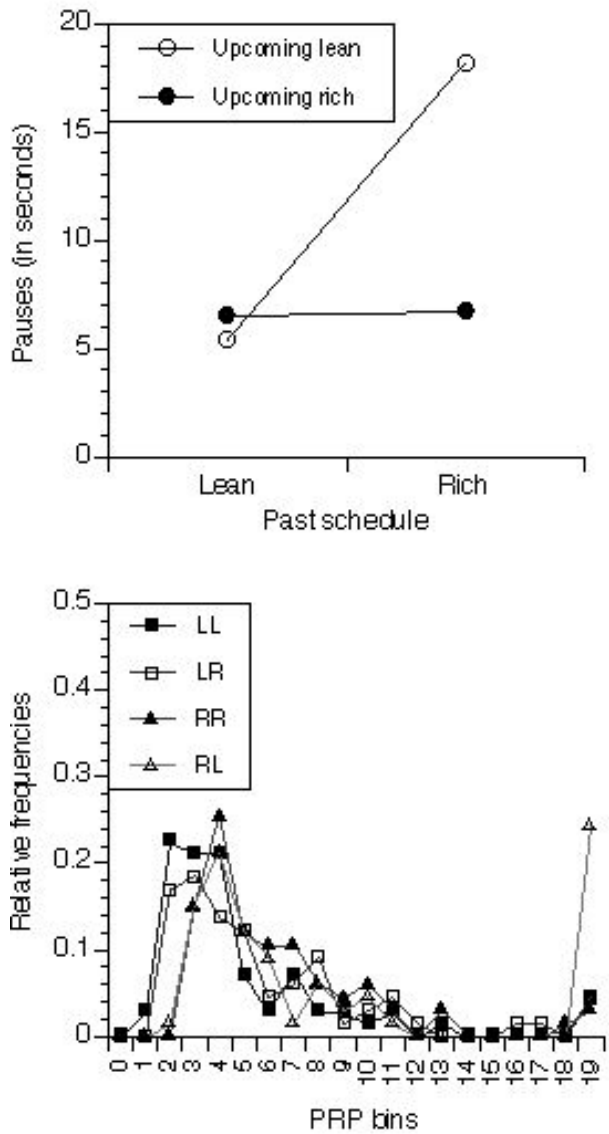

Figure 1

Although preliminary, the present results indicate that transitions from rich-to-lean reinforcement conditions can generate long PRPs in people, just as they do in pigeons. We currently are studying several variations to the procedure used herein, including some that provide the opportunity for a specific escape response that turns off the schedule-correlated stimuli. If the present findings are reproduced, such procedures may provide a laboratory model for the investigation of the escape-motivated behavior

that people with mental retardation often emit in naturalistic settings.

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