INTRODUCTION

The generalized matching law (GML) has not received as much empirical attention for describing naturally occurring human behavior. The GML differs from the original matching law in that it describes the relationship between response rates (or duration) and reinforcement of one alternative, relative to all other alternatives. The matching law has implications for teacher and student behavior and academic response allocation in classrooms (Martens, 1992; Neef, Mace & Shade, 1993; Neef, Mace, Shea & Shade, 1992; Shriner & Kramer, 1997). Thus, GML studies utilized in the educational setting provide an example of how basic theory can be applied in complex settings where many different causal variables interact and influence choice behavior in accordance with the generalized matching law.

This study addresses the lack of empirical research using the matching law in applied settings through quantitative assessment of student response allocation in the presence of variables associated with the sensitivity parameter (reinforcement rate and delay). If the matching law is determined to accurately describe human behavior in natural settings, future research may address the functional utility of the matching law for use in predicting human behavior in a natural setting.

METHOD (continued)

Experimental Conditions

- For each participant one cue (either circles or squares) was associated with a manipulation in rate or delay while the other cue was associated with no manipulation.
- All conditions were administered consistent with administration of a classroom math probe. (Witt, Daly, and Noell (2000))
- Baseline phases were implemented in which contingencies associated with each cue were identical and consisted of the immediate delivery of reinforcement at a rate of one token for every 10 correctly completed math problems.
- Threshold was defined as percentage of allocated response shifted to at least an 80%-20% split in favor of the richer schedule.

Delay Threshold

- The number of completed problems required to receive reinforcement (prizes) systematically increased for the rate S<sup>0</sup> (either circle or square) the other S<sup>0</sup> (either circle or square) remained the same as the baseline condition.
- Base 2 logarithmic scale (10, 12, 16, 24, 40) was used to increase performance requirements for reinforcement with the incremental rate changes occurring only after stable performance was achieved.
- The number of completed problems required to receive reinforcement (prizes) remained the same for both S<sup>0</sup> conditions (10 correctly completed problems for 1 prize), however the delivery of prizes was delayed systematically increasing by a base 5 logarithmic scale (5 min, 10 min, 30 min, 1440 min, etc.) for each session.
- Response in the presence of the rate S<sup>0</sup> remained identical to that of the baseline condition (i.e. immediate access to reinforcement and one prize for every ten correctly completed problems).

Rate vs. Delay

- Schedule of reinforcement for both variables were implemented based on response allocation and threshold levels determined in previous threshold conditions.
- The use of a concurrent schedule of reinforcement allowed for comparisons of two contingencies associated with each cue and its impact on response allocation.

RESULTS (continued)

- Overall, a rate threshold was determined for each participant.
- A delay threshold was established for each participant.
- In the rate vs. delay condition, 4 out of 5 participants chose to respond to the Delay stimulus. Therefore, these participants chose to complete less problems for more reinforcement but wait for access to the reinforcer.
- In the same condition, one participant allocated response to the Rate stimulus, or completed more problems for less reinforcement and attained access to the reinforcer immediately.

CONCLUSIONS

- Individualized thresholds for reinforcement rate and delay can be determined.
- This individualized threshold, when presented in a concurrent schedule, allowed for a direct comparison of these two sensitivity variables on response allocation.
- For a majority of the participants, rate of reinforcement had more of an impact on response allocation than delay. Thus, more participants chose to do less problems for more reinforcement with delayed access.
- Further research is needed to determine if, when presented with individualized rate and delay of reinforcement thresholds in a concurrent schedule, one sensitivity variable continues to impact response allocation over the other.