



# Comparing Concurrent Choice and Demand Curve Procedures as Assessments of Reinforcer Value



Allyson R. Salzer, Evan R. Dahl, Carlee A. Toddes, Molly A. Barlow, Carla H. Lagorio  
University of Wisconsin - Eau Claire

## INTRODUCTION

Within behavioral and economic fields, there are several distinct methods for determining the value of a commodity or reinforcer. Two of these methods are concurrent choice procedures and demand curve analyses. A concurrent choice paradigm involves having the subject choose between two different reinforcers; the one chosen more frequently is thought to have a higher value. By contrast, when establishing a demand curve, subjects make a fixed number of responses to earn one reinforcer type per session. The number of responses required to earn the same reinforcer amount is increased systematically across sessions to determine how hard they will work for that reinforcer; whichever sustains higher response outputs is thought to have a higher value. However, previous studies have indicated that these preference methods may not always align; that is - one reinforcer preferred in a choice context may not be consumed at a higher level as measured by demand analysis.

The current study tested both of these preference measures using the same subjects (Sprague Dawley rats) who could earn two reinforcer types: Ensure liquid diet and grain pellets. Results from this study can provide further evidence as to whether the results of these preference measures align, and can advance our understanding of the factors that influence the valuation of a commodity.

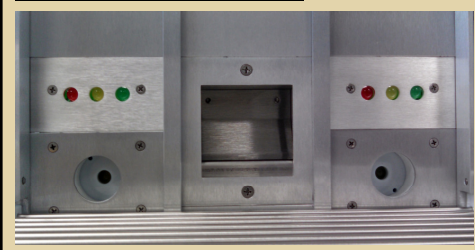
## RESULTS

Responses per session (top panel) and reinforcers per session (bottom panel) as a function of response requirement. Responses made when working for Ensure as a reinforcer are indicated by the filled circles; responses and reinforcers earned when working for grain are designated by filled blue squares. Lines indicate standard error across the six subjects.

In the final five concurrent choice sessions, subjects chose Ensure 95% of the time (914 out of 960 choices) and grain pellets 5% of the time (46 out of 960 choices).

The demand curves demonstrate the subjects demand grain higher than Ensure. However, the choices during concurrent choice sessions contradict the reinforce preference demonstrated by the demand curves.

## OPERANT CHAMBER



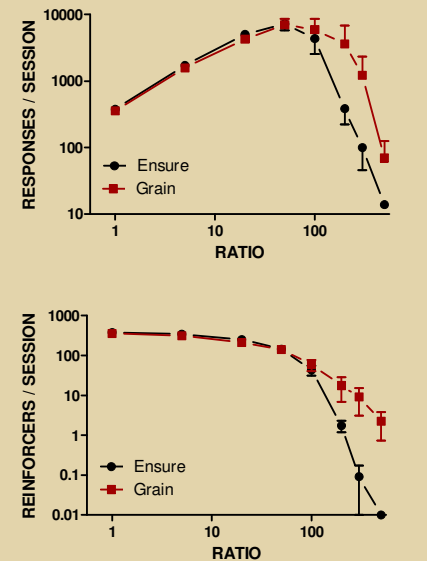
We would like to acknowledge the Office of Research and Sponsored Programs for their support in our research.

## METHODOLOGY

Six Sprague Dawley rats served as subjects; sessions were conducted in a standard operant chamber containing nose-poke response keys, stimulus lights, and food dispensers. Each subject was first exposed to the demand curve procedure, in which they responded to gain access to one reinforcer type per condition (three subjects responded for grain first, three Ensure). To generate a demand curve, subjects were exposed to response ratios that increased every four sessions (see Table 1 for a listing of the ratio values). The main variables of interest are the: (a) number of responses emitted per session; (b) number of reinforcers earned per session; and (c) rate of responding. Daily sessions lasted for 80 minutes, during which subjects could earn an unlimited number of reinforcers.

After subjects completed the demand curves for each reinforcer type separately, they were exposed to the concurrent choice procedure. In this procedure, operant chambers were modified to include food delivery receptacles for both reinforcers. Responding on the right side of the chamber would produce grain pellets; responding on the left side of the chamber provided access to Ensure. Subjects made 60 choices in daily sessions for a minimum of 20 sessions and until preferences reached a point of stability.

## DEMAND CURVE



## CONCURRENT CHOICE

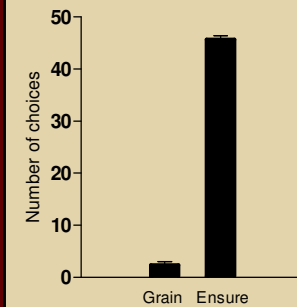


Table 1

Ratio	1	5	20	50	100	200	300	500
-------	---	---	----	----	-----	-----	-----	-----

## DISCUSSION

Results of the present study indicate that methods of assessing reinforcer value do not always yield a similar preference. Under a concurrent-choice paradigm, Ensure was highly preferred over grain pellets. However, when the two reinforcer types were available singularly under a demand function, grain had a higher level of consumption as compared with Ensure. These results have implications for fields attempting to utilize and understand preference assessments and reinforcer value calculations. Continued research will examine how other assessments of reinforcer efficacy (e.g., progressive ratio breakpoints) align with these general findings.