Does Immediate Liquid Feedback Help Improve Task Performance to Maximize Monetary Reward?

by

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While previous work has shown that both primary (liquid) and secondary (monetary) rewards improve cognitive task performance, neuroimaging results showed differences both in brain regions recruited and the temporal dynamics of brain activation (Beck et al., 2010). These findings were expanded upon in a pilot study in which primary reinforcers (juice and saltwater) were used as performance feedback to indicate receipt of later monetary reward. The purpose was to investigate how different liquids affect motivated task performance. While both feedback liquids improved task performance in comparison to baseline measures, juice resulted in greater improvements than saltwater. The current study serves as an extension upon the previous pilot through the inclusion of a neutral liquid to determine if juice feedback improves task performance, or saltwater feedback hinders task performance. The cognitive task was a letter/digit task-switching paradigm. Subjects first performed a series of task trials without reward to determine baseline performance measures. Next, the experiment was performed under three different incentive conditions, one for each feedback liquid. Participants now had the opportunity to earn a monetary reward on indicated trials if they performed the trial correctly and were faster than the 50th percentile of their baseline reaction time. The participant received a drop of liquid if they met the criterion, indicating that they earned the monetary reward for that trial. Each individual's reward rate (the percentage of trials in which they were rewarded) was calculated for all three feedback liquids. Preliminary results (n=11) suggest that average reward rate was significantly higher for juice than for saltwater. The average reward rate for the neutral solution was between that of saltwater and juice, and showed a trend toward being higher than saltwater reward rate. Future analyses will be conducted on reaction time and accuracy measures in all three liquid conditions.