**Model Specification**

To capture the process of learning the elasticity of control, we designed a model *(elasticity model)* that explains subjects’ choices of how many tickets to buy using latent beliefs about the presence of control and its degree of elasticity (elastic vs. inelastic environments) using three beta distributions, each defined by two parameters ) which accumulate evidence for the presence () or absence () of overall control, evidence as to whether successful boarding does () or does not () require additional resources (i.e. is one ticket enough) and as to whether full () or partial () additional investment of resources is necessary.

The estimated controllability in environment *s,* and the degree to which the likelihood of boarding the selected vehicle depends on each number of tickets (n=1,2,3) can be calculated using the expected value of each beta distribution:

Because participants can win 20% of the time even when they fail to board their selected ride, we calculate the probability of winning with *n* tickets as:

Taking the possible reward (*)* and ticket costs ( into account, we can calculate the expected value for purchasing *n* tickets tickets as:

We can separately calculate which is reward times the probability that walking will lead to the reward (20%).

The probability that a subject will purchase 0,1,2, or 3 tickets is calculated using the SoftMax function such that:

Where, is an inverse temperature parameter and are parameters that represent subject biases for purchasing 1,2, or 3 tickets respectively.

We will test whether the task successfully induces elasticity estimates by comparing the above model to a model that learns the expected level of success given different degrees of invested resources from direct observation, without a latent representation of elasticity (*standard controllability model*). Such a model can also be represented as beta distributions which accumulate the number of times participants successfully boarded ) and did not board ) their vehicle, separately for each number of tickets, and these are similarly used to calculate the expected reward () of purchasing each number of tickets. The key difference between the models is that a latent representation of elasticity allows for inferences across the numbers of tickets purchased. For example, failing to board after purchasing three tickets can allow for an inference of an overall low controllability thereby decreasing the expected reward for purchasing one and two tickets as well.