**Methods**

In order to test the effects of each parameter in the model of male mating effort on the corrective effect of *Q* we created an individual based model to simulate the trials. Each simulation models the interactions as in the real trials: there are 3 pairs of brother males, and 6 females. The size of the females is sampled such that two females come from each of three uniform distributions: 19-25, 25-30, and 30-35 grams (? Units). The range of these distributions was chosen to approximate the range of sizes of females in the real trials for each size category. We then use the same size-fecundity curve as in the real trials to estimate female profitability (*P*).

Each time step of the models each male calculates the instantaneous effort (E’ – check the symbol) they should allocate to each female, they then pick a female to pursue with probability proportional to her E’. Additionally each male has a 10% chance to decide to pursue no female. Each male assesses females and makes a decision in turn, the order males chose their actions is randomized each time step. For all trials where *C* in equation YYY is not excluded we set it’s value to 0.47, the value estimated from the real trials (is that where this comes from?).

The simulation proceeds for 500 time steps (which is a total of 3,000 male choices), and then the number of time steps a randomly chosen focal female was pursued within each competitive context is calculated. This value is then corrected using equation XXX above.

To test the effects of each of the three parameters in the model we exclude their effects on male choices one by one, however we do not change how equation XXX is used therefore our corrective factor Q still assumes these parameters are acting. If these parameters effects can be ‘masked’ by our calculation of Q then we would expect the output of some (or all) of these trials to match the default simulations where males are choosing based on all three parameters. In simulations where relatedness is ignored by males we set *r* in equation YYY to 0, when there is no cost to competition we set *C* to 0, and when female profitability is ignored we set the profitability of all females to 1 regardless of her size.

We ran a total of 50 simulations for each parameter set and present the average and standard error of O’, the corrected observed values below. All source code is available online at XYZX.

**Results**

The results of the base simulation with all parameters included qualitatively matches those of the real trials (Fig XXX). The removal of each parameter in turn also affected the results in the direction expected, indicating that our correction using Q does not hide the effects of important model parameters (Fig YYY). (You can go into more detail here once we have plots…)