Monkeys reject unequal pay

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Original paper:

Brosnan, S. F., & De Waal, F. B. (2003). Monkeys reject unequal pay. *Nature*, *425*(6955), 297.

Reference for the original paper:

http://saki.caltech.edu/biCNS217_2008/PDFs/Brosnan2003.pdf

Project created for the class:
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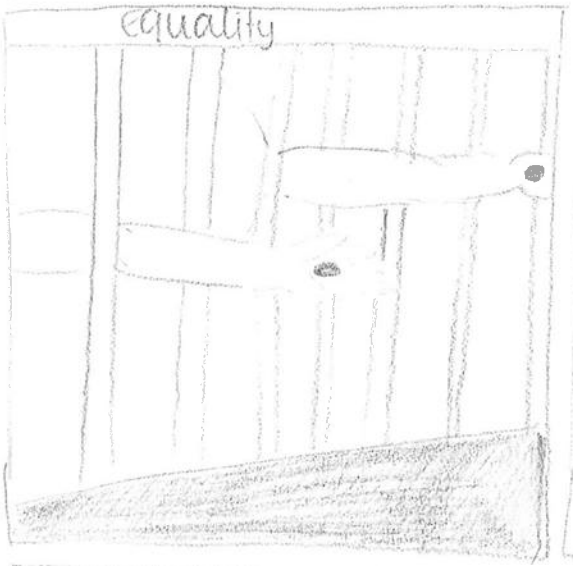
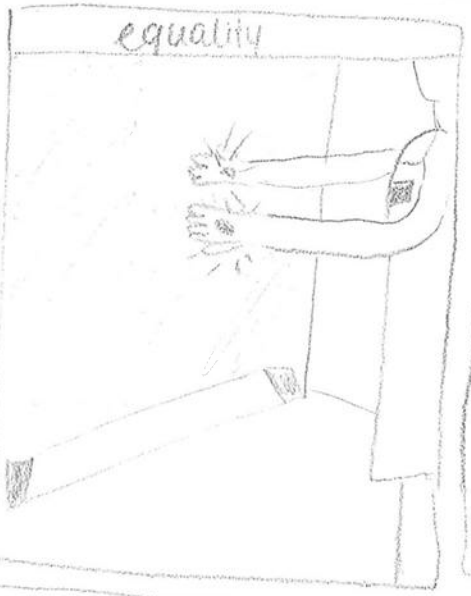
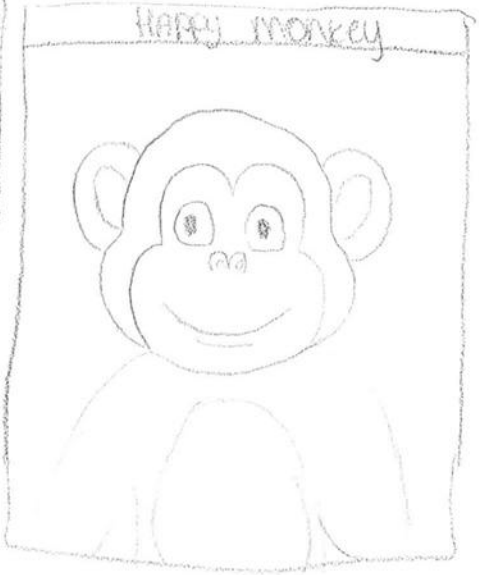
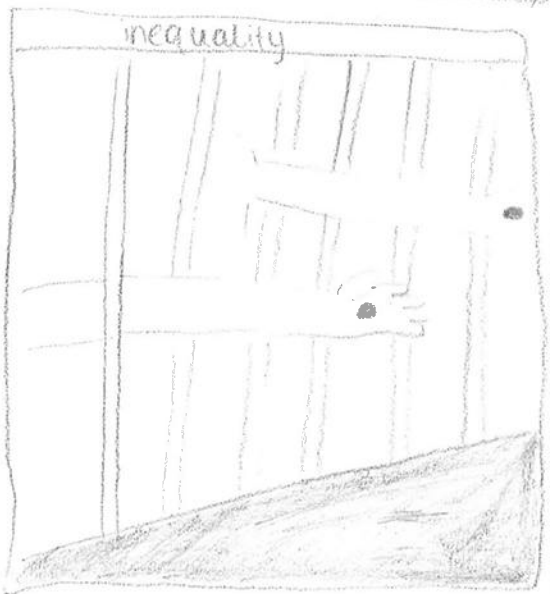
Instructor: Neil Cohn, neilcohn@visuallanguagelab.com, www.visuallanguagelab.com

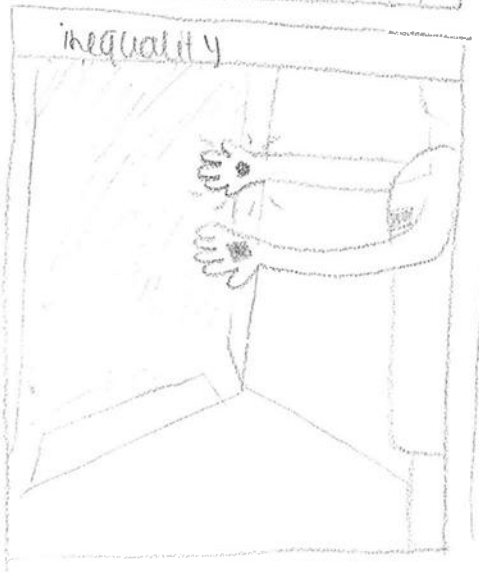
MONKEYS REJECT UNEQUAL PAY

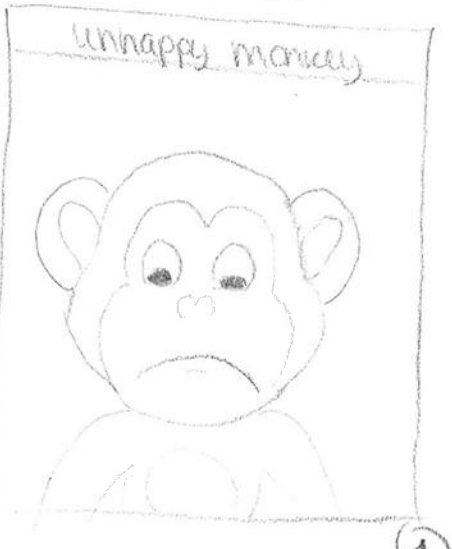






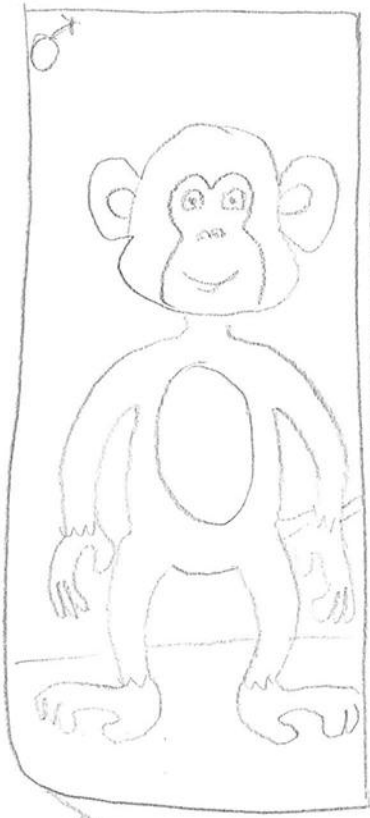


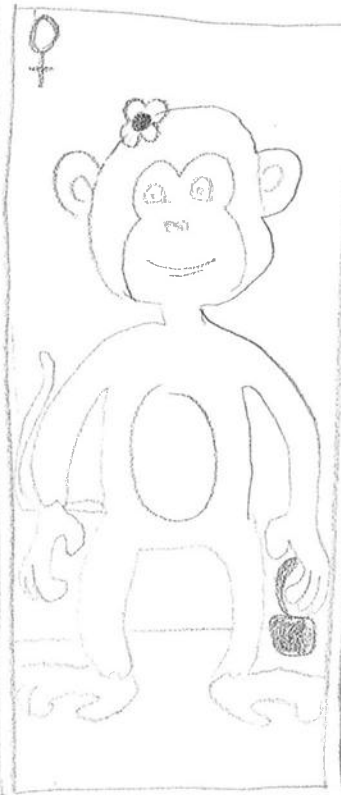




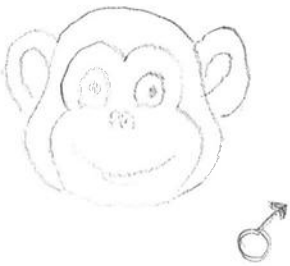
THE INFLUENCE OF GENDER

♀ ♂ ♀ ♂ ♀ ♂

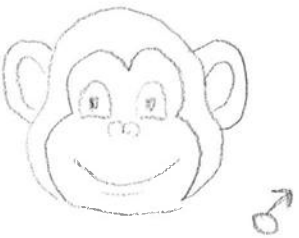




equality



inequality



equality

inequality

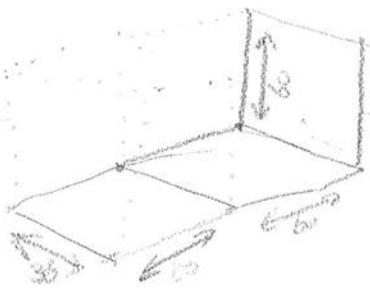
METHOD

5 x ♂

5 x ♀

↳ 1 x ♀

TEST CHAMBER

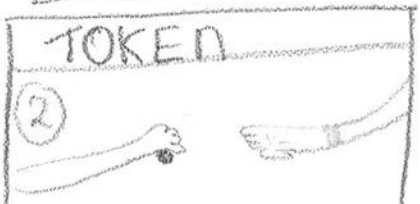


TOKEN

1

TOKEN

2



NO throwing with tokens!

Token = (real)

High value food

= grape

low value food

= cucumber

Time for exchange

bo S.

EFFORT CONTROL

no exchange
→ grape
→ cucumber
= inequality

Congres

FOOD CONTROL

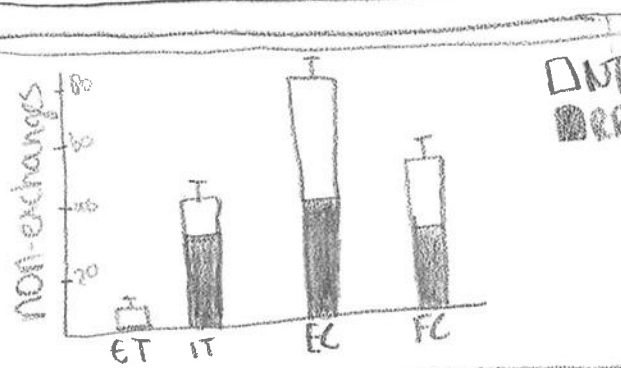
no partner
→ grape
in compartiment of partner
→ cucumber
= inequality

Incomplete
① failure to hand back token
② failure to accept or eat the proffered reward

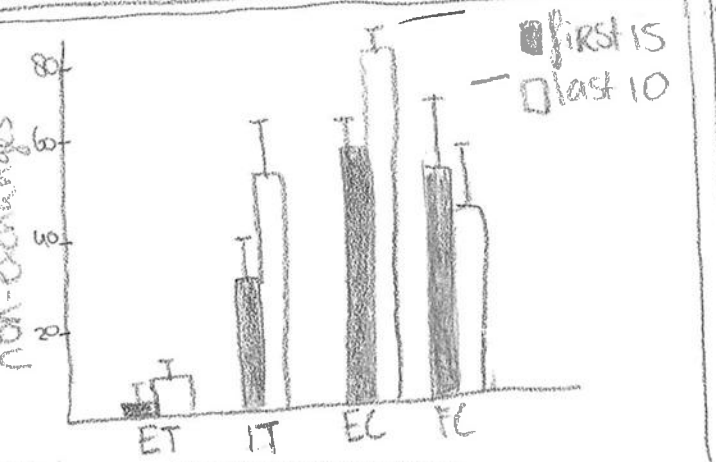
1 = NT
2 = RR

① N.T = NO TOKEN

RR = REJECT REWARD



← Figure 1. Mean percentage ± SEM of failures to exchange for females across the four test types. Lines indicate significant differences between conditions (Tukey's multiple comparisons). ET (equality test). IT (inequality test. EC (effort control). FC (Food control)



← Figure 2. mean percentages of failures to exchange in the first 15 trials (■) versus the last 10 trials (□) per test. Stars indicate differences at P=0.05 (exact Wilcoxon signed ranks test) ET (equality test), IT (inequality test), EC (effort control), FC (food control)

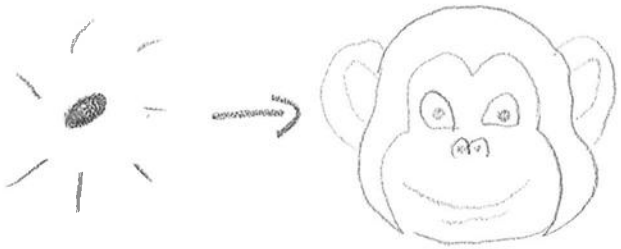
MORE RESULTS

I have some more results. The presence of high-value rewards reduced the tendency to exchange for low-value rewards.

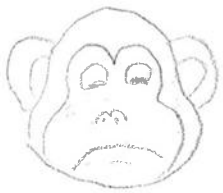
($F_{3,16} = 25.78$, $P < 0.001$)

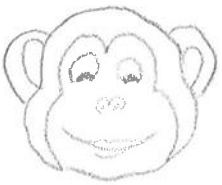
→ figure 1

grape present → happy monkey



The strongest increase in refusal to exchange occured if a partner received better rewards without any effort





Exchange behaviour may change over the course of a test

Each subject receives two tests of each condition, each with 25 trials

Failed exchanges (NT & RR) might increase over consecutive trials if subjects did not immediately recognize that they were receiving a lesser reward, but learned over time

For equality, inequality and effort control conditions, non-exchanges increased over time.

- equality = $T = 9$, $n = 4$, $p = 0.25$
- inequality: $T = 13$, $n = 5$, $p = 0.18$
- effort control = $T = 15$, $n = 5$ $p = 0.06$

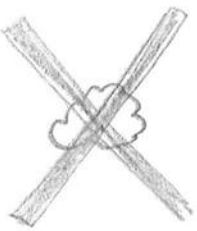
see figure 2.

how about food controls?

For food controls, non-exchanges decreased over the course of the test

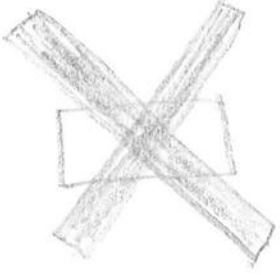
$T = -15$, $n = 5$, $p = 0.06$

45.4% NT



$F_{3,16} = 8.43$, $p = 0.001$

54.6% RR

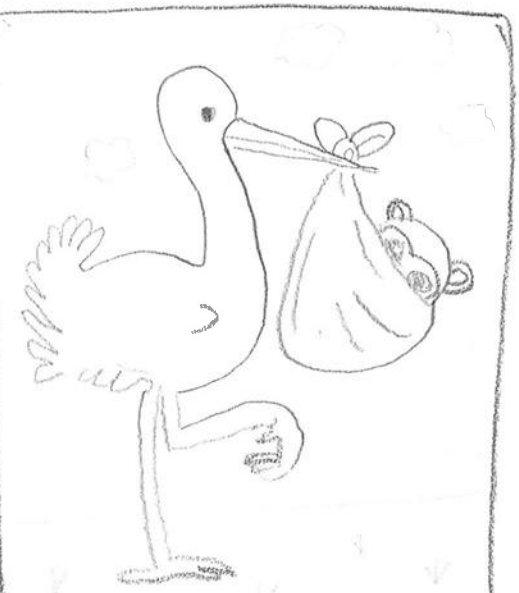


$F_{3,16} = 7.73$, $p = 0.002$

so this good or bad, Sarah?

Well, for that answer we have to take a look at the beginning!

Two years earlier



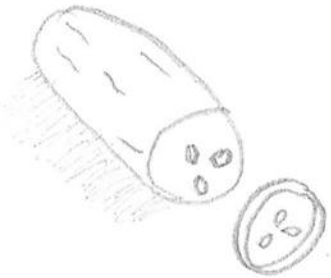
Two years Later

- failure to hand back received token is highly unusual
- in two years, these failures occurred less than 0.5%

So, the refusal of the token (NT/RR) is due to feelings of inequality

NT

The increase in NT cannot be explained by the absence of positive reinforcement, as rewards is continue to be cucumber, an accepted reward in the equating test.

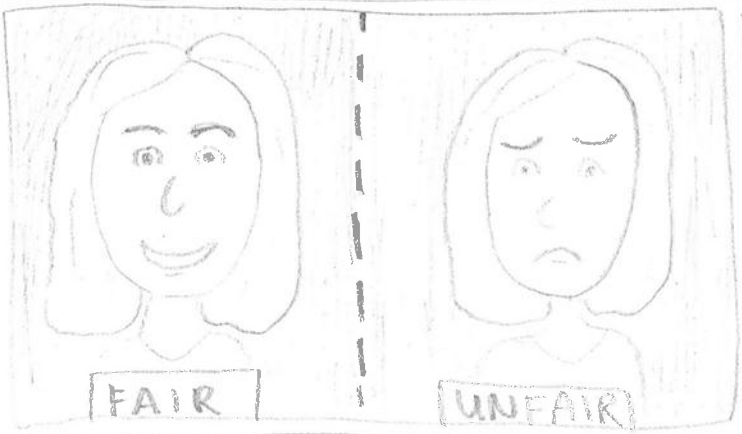


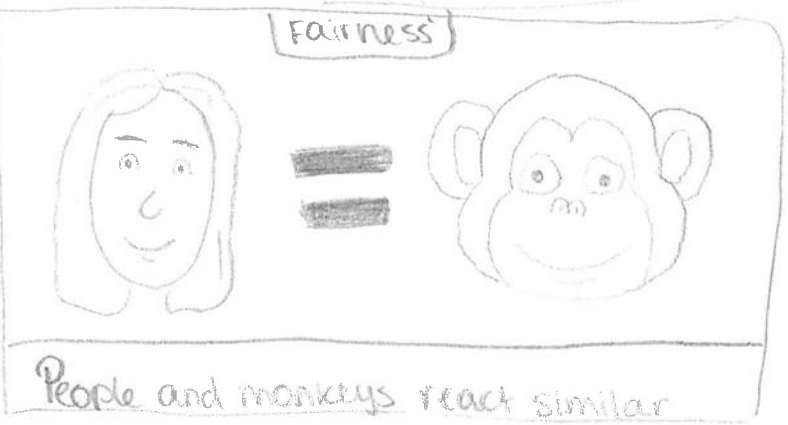
RR

When refusing the reward subjects forfeited a directly accessible food that they readily accept and consume under almost any other set of circumstances.

One explanation: violated expectations. Monkeys forego a low-value reward if high-value reward is anticipated

Discussion





People and monkeys react similar

Although our data cannot elucidate the precise motivations underlying these responses, one possibility is that monkeys similar to humans, are guided by social emotions.

These emotions, known as 'passions' by economists, guide human reactions to the efforts, gains, losses and attitudes of others.