

## SUPPLEMENTARY MATERIALS

### Why do dogs look back at the human in an impossible task? Looking back behaviour may be over-interpreted.

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#### Summary tables of data used in the analyses.

| Group             | Condition | Persistence (sec) | Latency of looking back (sec) | Duration of looking back (sec) | Duration of tail wagging (sec) | Test duration (sec) |
|-------------------|-----------|-------------------|-------------------------------|--------------------------------|--------------------------------|---------------------|
| pet dogs          | social    | 53.1 ± 77.44      | 38.31 ± 39.81                 | 46.93 ± 47.74                  | 43.27 ± 63.34                  | 498.16 ± 112.04     |
|                   | dummy     | 94.91 ± 117.24    | 49.73 ± 73.33                 | 15.54 ± 21.17                  | 7.83 ± 13.28                   | 499.44 ± 271.5      |
|                   | object    | 60 ± 97.65        | 39.78 ± 27.03                 | 2.37 ± 3.12                    | 0.29 ± 0.939                   | 447.42 ± 209.9      |
| free-ranging dogs | asocial   | 100.49 ± 186.89   | *                             | *                              | *                              | 459.52 ± 299.8      |
|                   | social    | 48.38 ± 56.2      | 42.7 ± 42.09                  | 18.58 ± 37.55                  | 14.76 ± 48.94                  | 411.04 ± 58.60      |

Table 1. Mean and standard deviation of durations, in pet dogs and free-ranging dogs.

| Group             | Condition | Frequency of looking back imp <sup>(1)</sup> | Frequency of looking back poss <sup>(2)</sup> | Frequency of attempting the imp | Frequency of look up poss <sup>(2)</sup> | Frequency of look up imp <sup>(1)</sup> |
|-------------------|-----------|----------------------------------------------|-----------------------------------------------|---------------------------------|------------------------------------------|-----------------------------------------|
| pet dogs          | social    | 1.47 ± 1.26                                  | 0.26 ± 0.47                                   | 7.89 ± 3.43                     | 0.6 ± 0.63                               | 2.93 ± 1.67                             |
|                   | dummy     | 0.65 ± 0.74                                  | *                                             | 8.65 ± 6.58                     | *                                        | *                                       |
|                   | object    | 0.26 ± 0.73                                  | *                                             | 6.26 ± 4.28                     | *                                        | *                                       |
| free-ranging dogs | social    | 1.07 ± 0.83                                  | 0.85 ± 0.77                                   | 4.86 ± 3.06                     | 1.57 ± 1.74                              | 3.14 ± 2.21                             |
|                   | dummy     | 0.78 ± 0.67                                  | *                                             | 4 ± 3.23                        | *                                        | *                                       |

Table 2. Mean and standard deviation of frequencies (number of times a behaviour was performed), in pet dogs and free-ranging dogs; imp: impossible bowl, poss: possible bowls. (1) number of times the subjects looked back or looked up after attempting the impossible bowl; (2) number of times the subjects looked back or looked up after attempting the possible bowls (note that looking back in this case is considered only if it happened in the two second period after the subject stopped interacting with the bowl. Additionally, note that after interacting with the possible bowls subjects were busy eating the food on the ground while this did not happen after interacting with the impossible bowl).