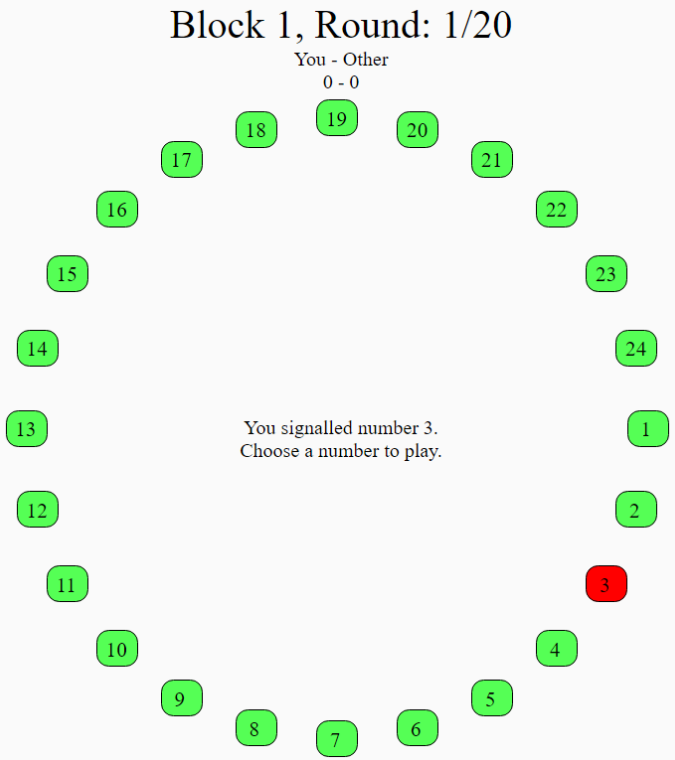
Human behaviour in the Mod-Signal Game

Abi Raveenthiran
s4010132

Supervisors: mr. J.D. Top (MSc) & dr. H.A. de Weerd

Mod-Signal Game

- Numbers range from 1 to 24
- 2 players
- Players choose a number simultaneously
- Players gain a point if their choice is exactly 1 higher than other player's choice
- One player signals before round
- Player that signals alternates every round
- Player does not have to adhere to signal

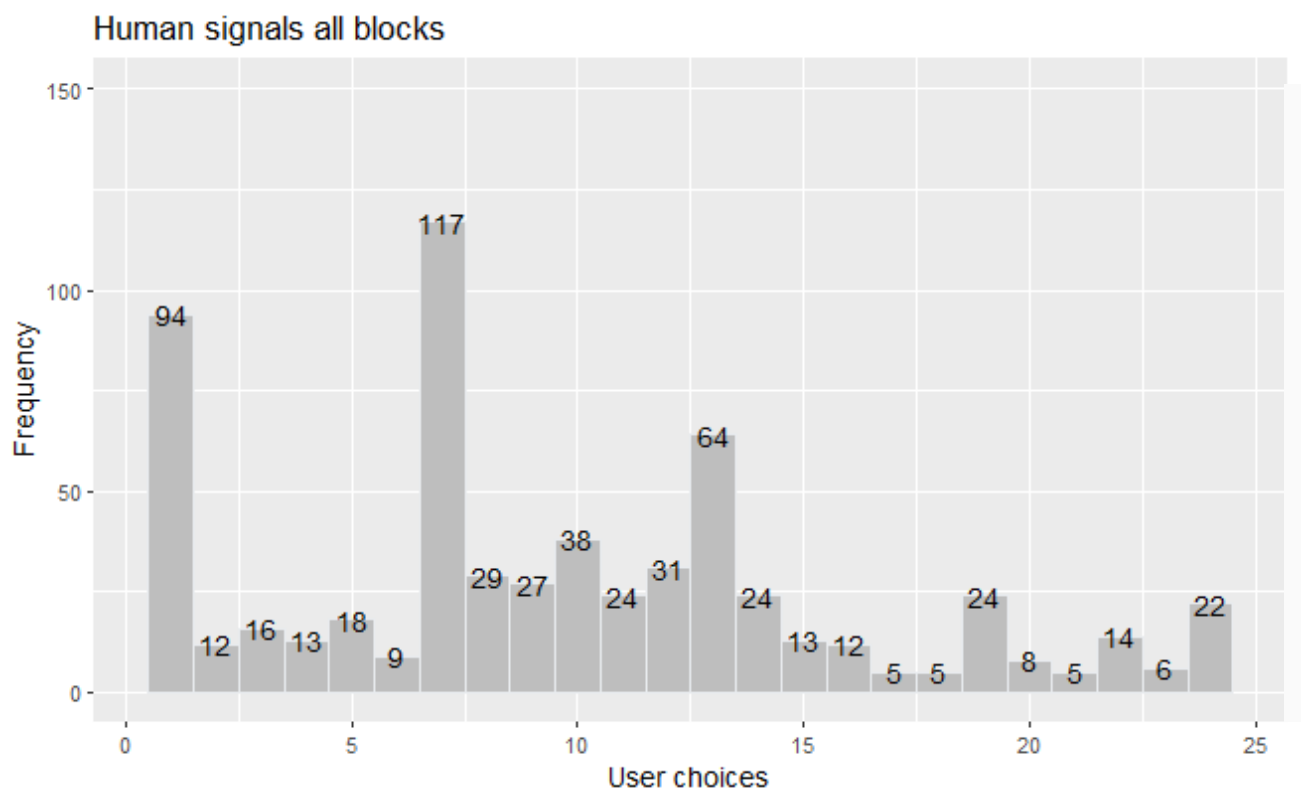


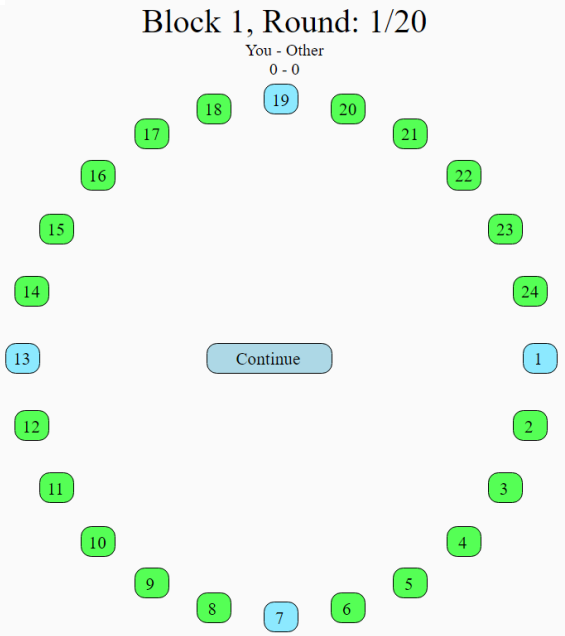
Methodology

- 21 participants
- 3 participants per session (+ confederate)
- played on computer
- participants sit in the same room separated by barriers
- headphones
- 3 blocks of 20 rounds per session
- questionnaires
- confederate pretends to play as the agent

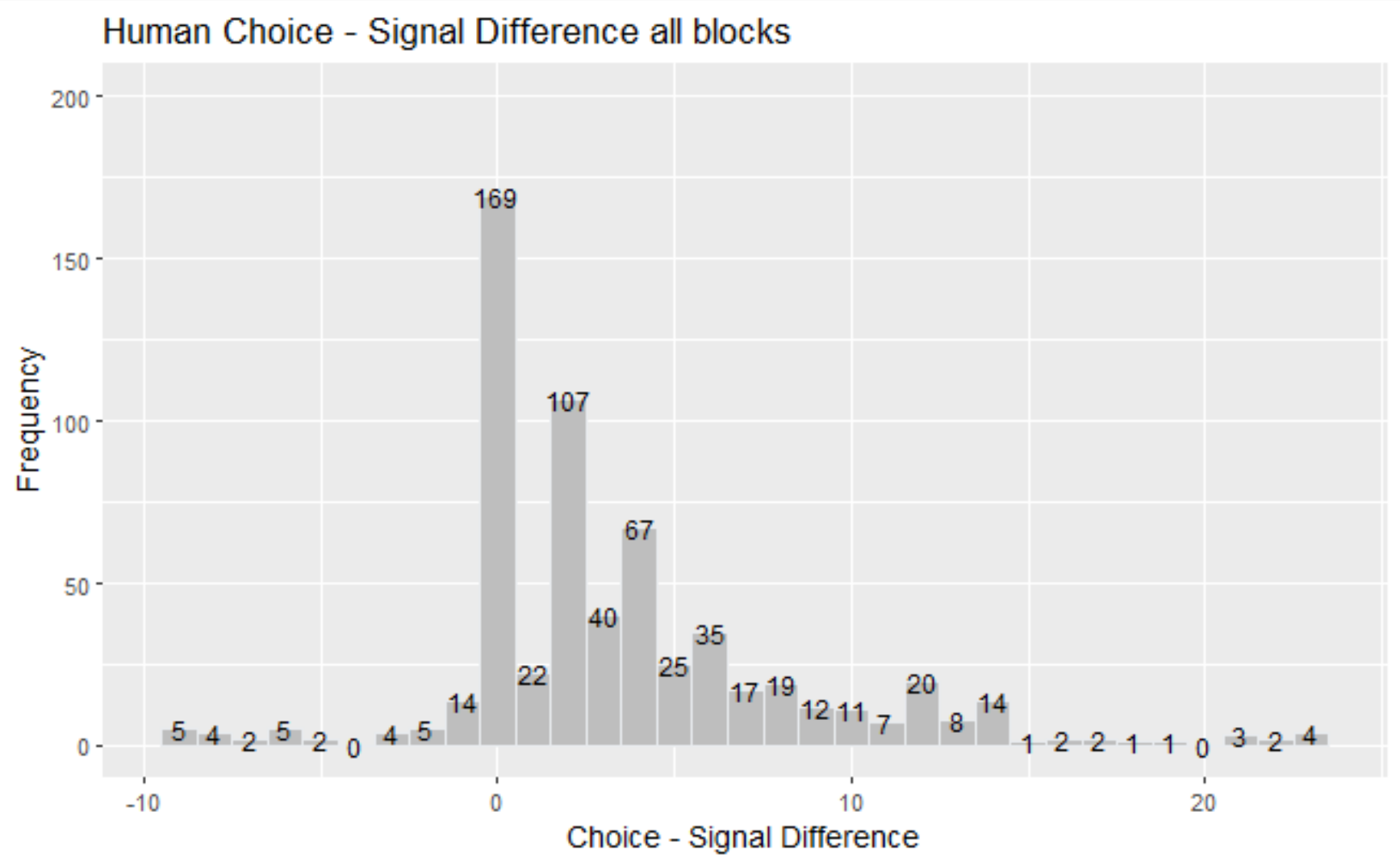
Results

Results

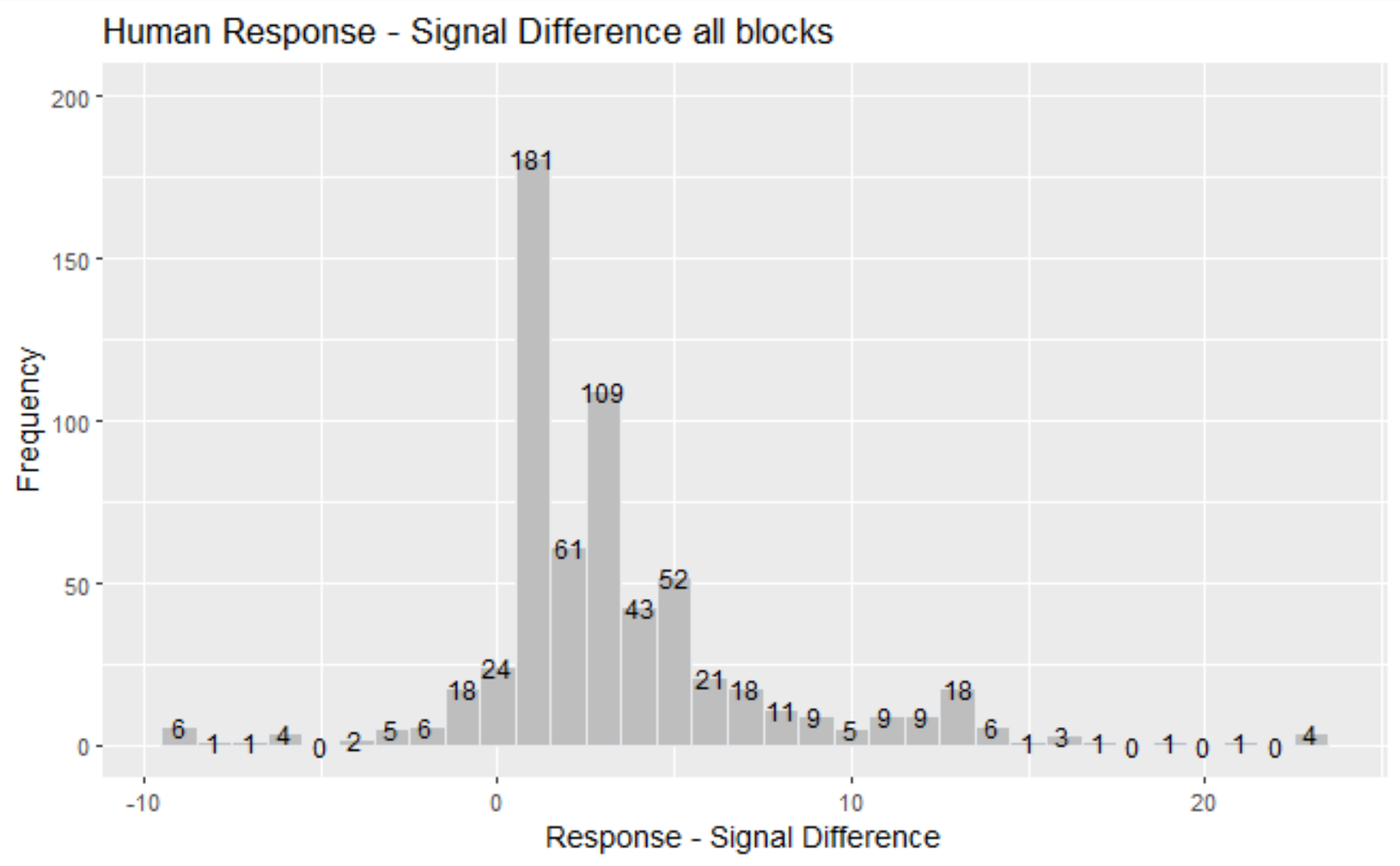

Human signals all blocks
Frequency
User choices
150
100
50
0
0
5
10
15
20
25
94
12
16
13
18
9
117
29
27
38
24
31
64
24
13
12
5
5
24
8
5
14
6
22


Block 1, Round: 1/20
You - Other
0 - 0
Continue
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

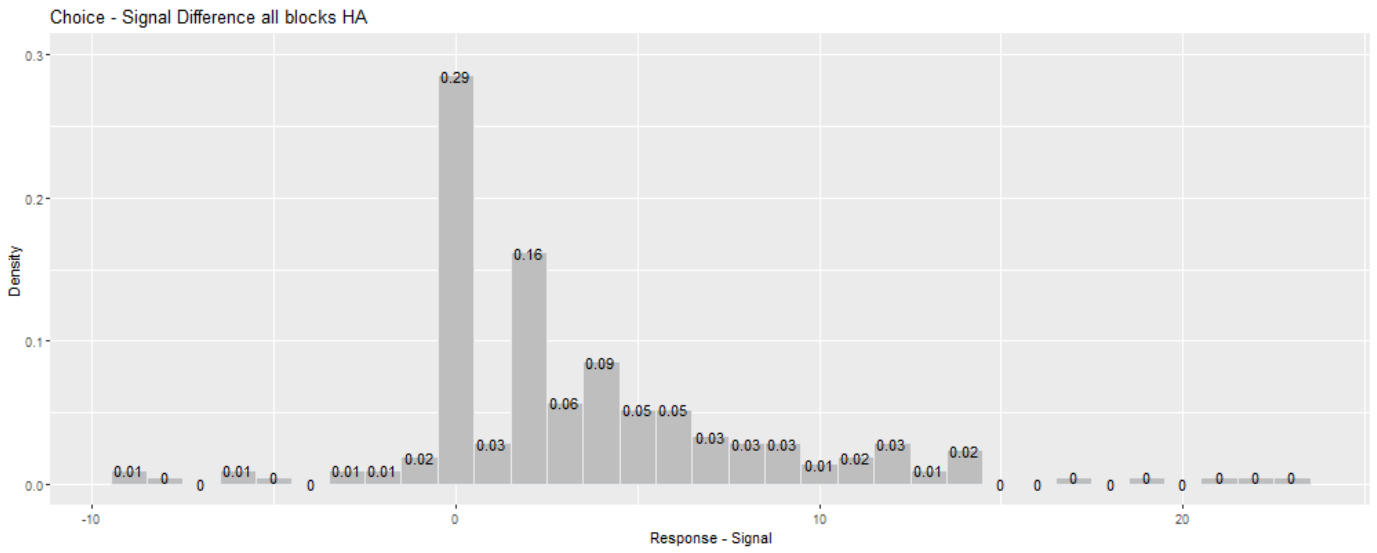
Results

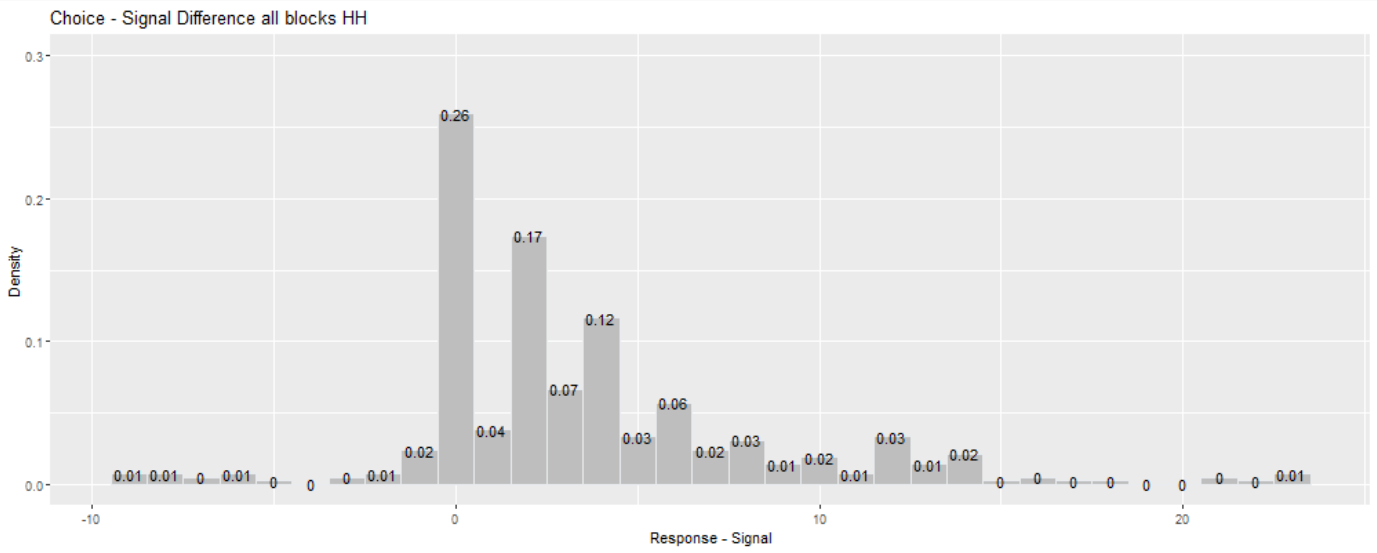

Human Choice - Signal Difference all blocks
Frequency
200
150
100
50
0
5
4
2
5
2
0
4
5
14
169
22
107
40
67
25
35
17
19
12
11
7
20
8
14
1
2
2
1
1
0
3
2
4
-10
0
10
20
Choice - Signal Difference

Results

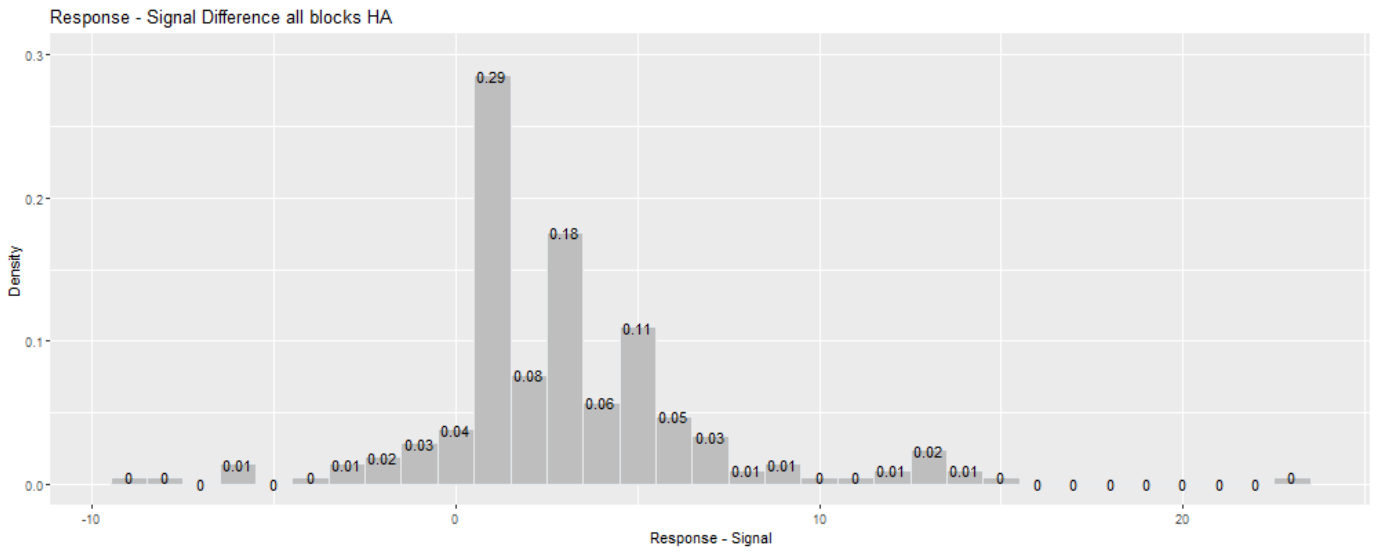

Human Response - Signal Difference all blocks
Frequency
200
150
100
50
0
6
1
1
4
0
2
5
6
18
24
181
61
109
43
52
21
18
11
9
5
9
9
18
6
1
3
1
0
1
0
1
0
4
-10
0
10
20
Response - Signal Difference

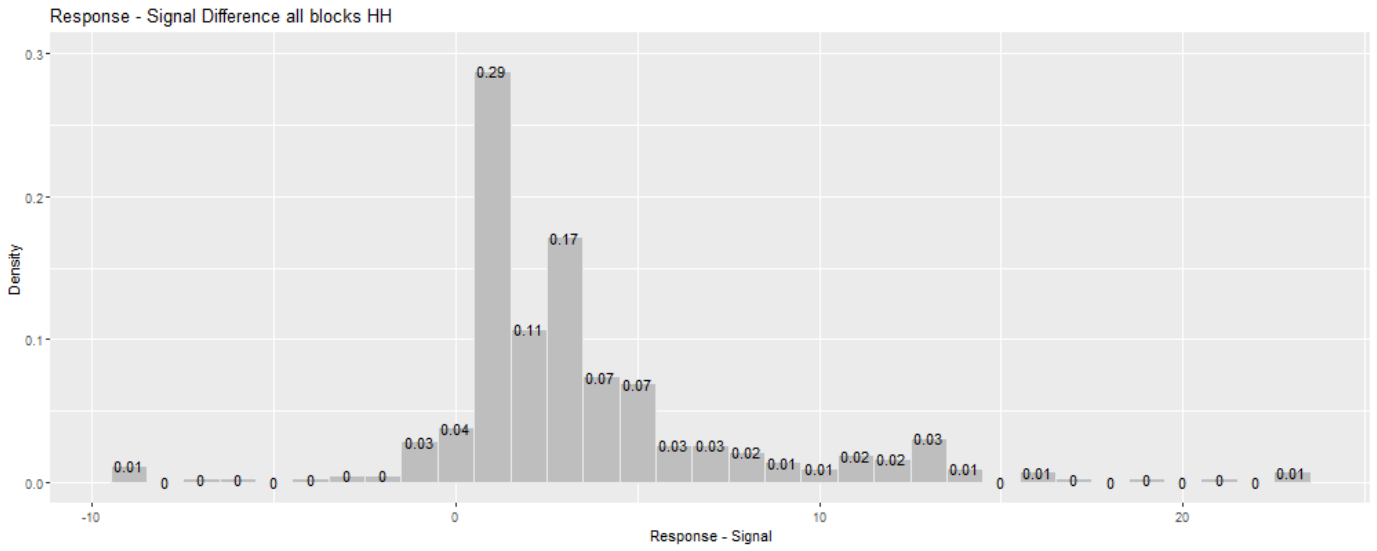
Results


Choice - Signal Difference all blocks HA
Density
Response - Signal
0.3
0.2
0.1
0.0
-10
0
10
20
0.01 0 0 0.01 0 0 0.01 0.01 0.02 0.29 0.03 0.16 0.06 0.09 0.05 0.05 0.03 0.03 0.03 0.01 0.02 0.03 0.01 0.02 0 0 0 0 0 0 0 0 0


Choice - Signal Difference all blocks HH
Density
Response - Signal
0.3
0.2
0.1
0.0
-10
0
10
20
0.01 0.01 0 0.01 0 0 0 0.01 0.02 0.26 0.04 0.17 0.07 0.12 0.03 0.06 0.02 0.03 0.01 0.02 0.01 0.03 0.01 0.02 0 0 0 0 0 0 0 0 0.01

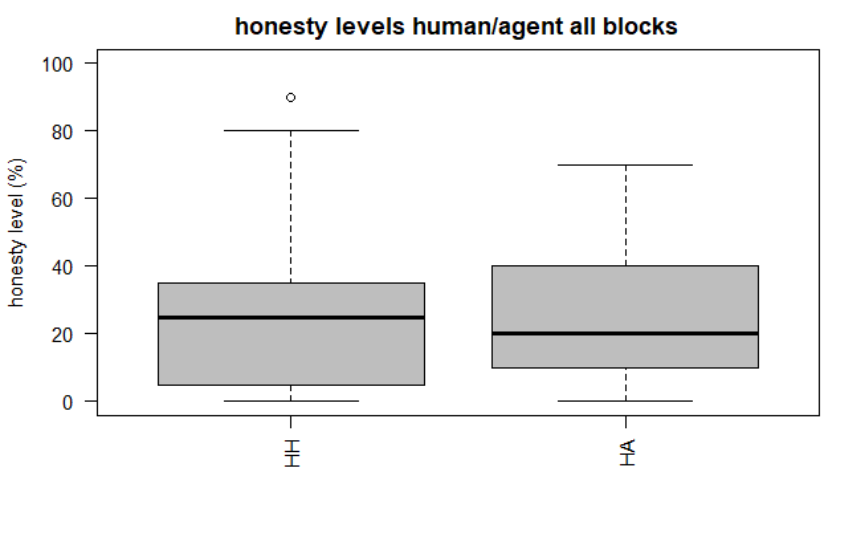
Results

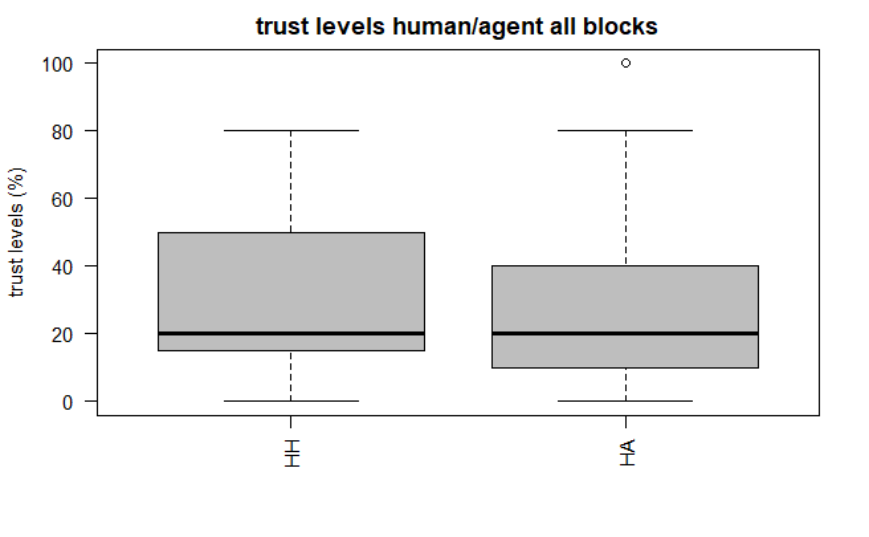

Response - Signal Difference all blocks HA
Density
0.3
0.2
0.1
0.0
0.29
0.18
0.11
0.08
0.06
0.05
0.04
0.03
0.02
0.01
0
-10
0
10
20
Response - Signal


Response - Signal Difference all blocks HH
Density
0.3
0.2
0.1
0.0
0.29
0.17
0.11
0.07
0.04
0.03
0.02
0.01
0
-10
0
10
20
Response - Signal

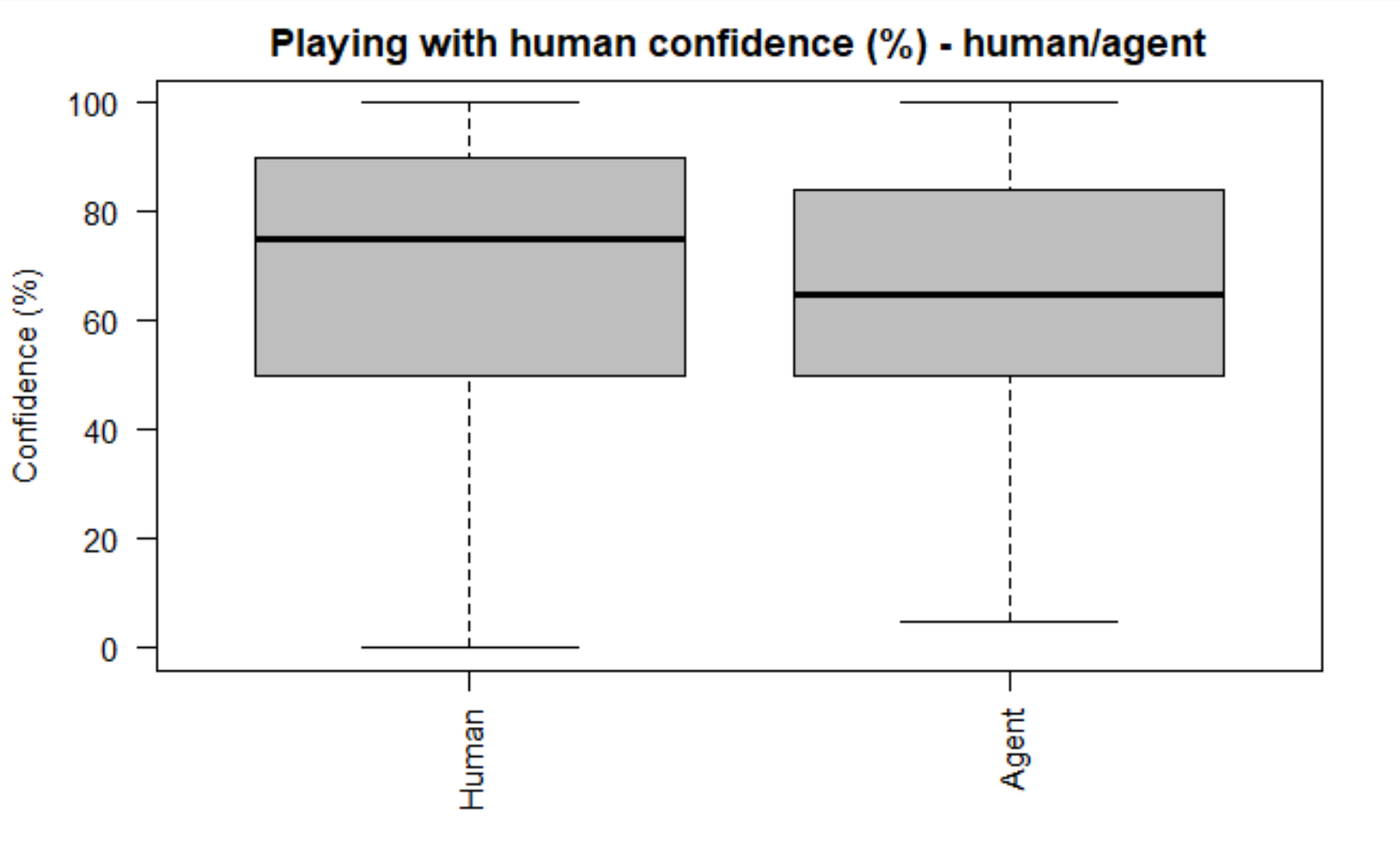
Results

- Honesty: playing the number that you signalled
- Trust: playing the number that the other player signalled + 1

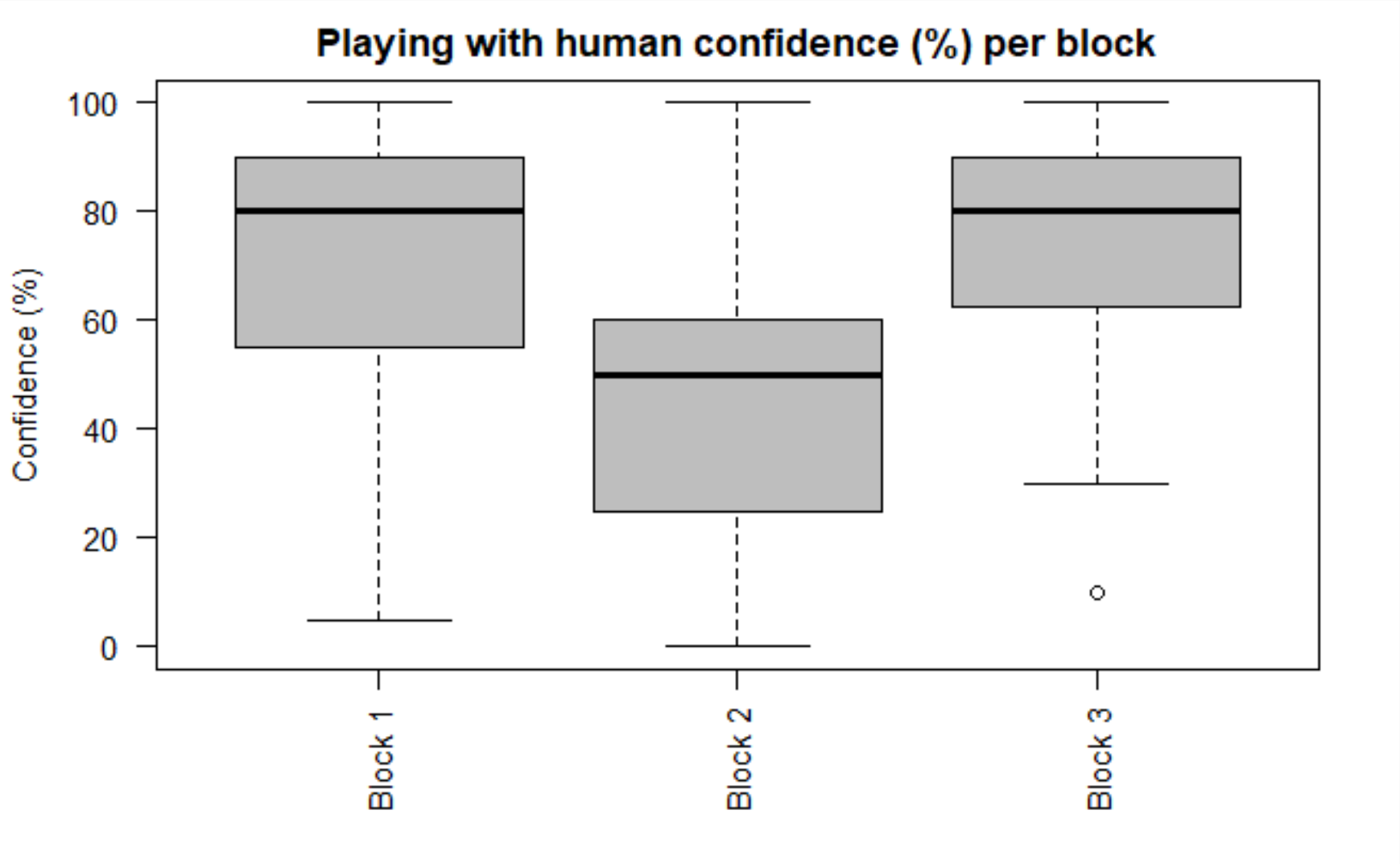




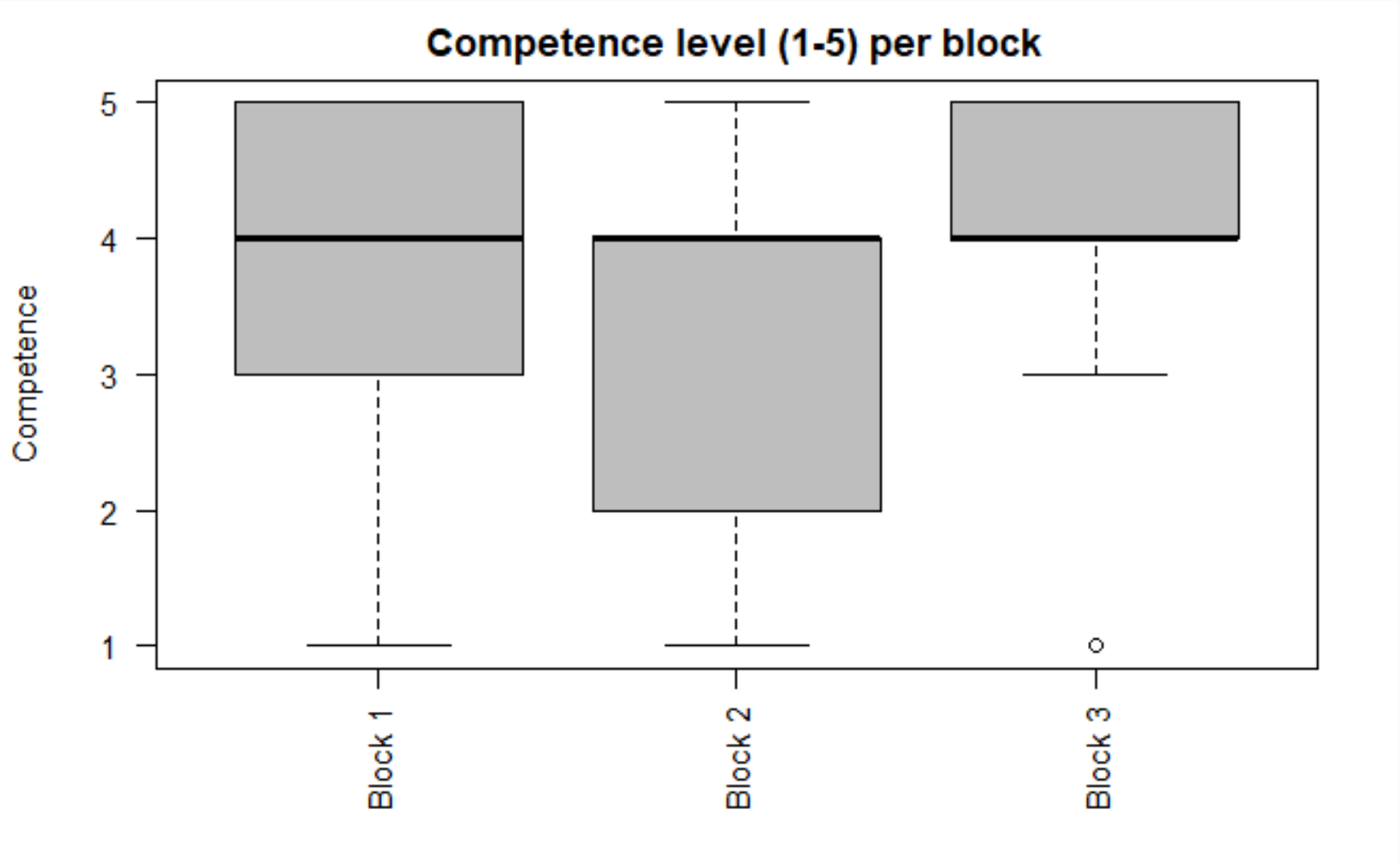
Results


Playing with human confidence (%) - human/agent
Confidence (%)
100
80
60
40
20
0
Human
Agent

Results


Playing with human confidence (%) per block
Confidence (%)
100
80
60
40
20
0
Block 1
Block 2
Block 3

Results


Competence level (1-5) per block
Competence
5
4
3
2
1
Block 1
Block 2
Block 3

Conclusion

Results show that there seems to be little to no difference in human behaviour between playing with another human and unknowingly playing against an agent

Discussion

- Extract strategies
- Honesty/trust reaction times
- Experiment setup
- Order effect blocks

Appendix

Appendix: Agent behaviour

- Always cooperates on first round
- Cooperates with a certain probability after first round
- Probability = $\frac{\text{number of rounds played cooperatively in last 3 rounds}}{\min(3, \text{round number})}$
- Deceives by taking the difference of the human's choice and the cooperative choice from last round and adding that to the current signal + 1

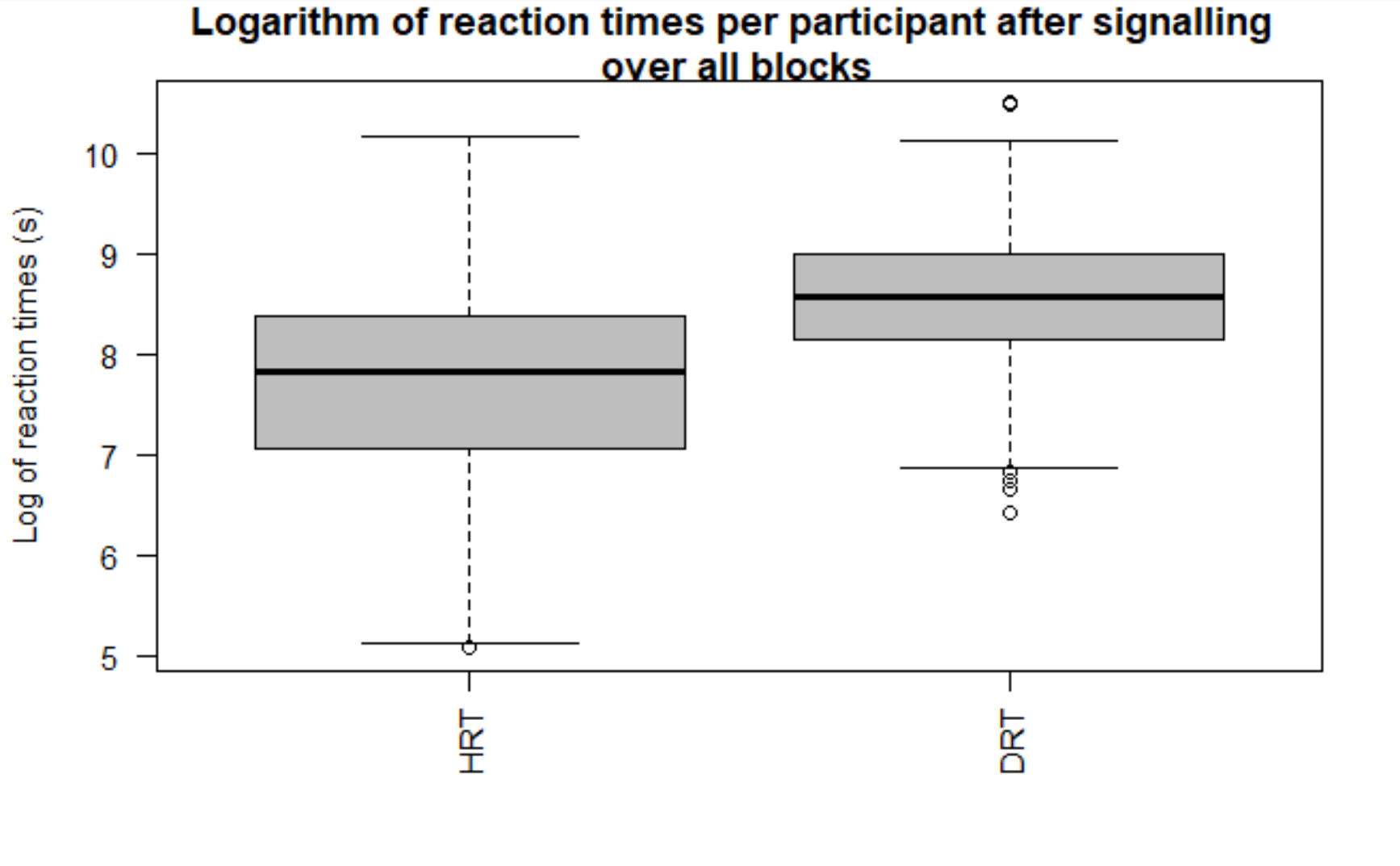
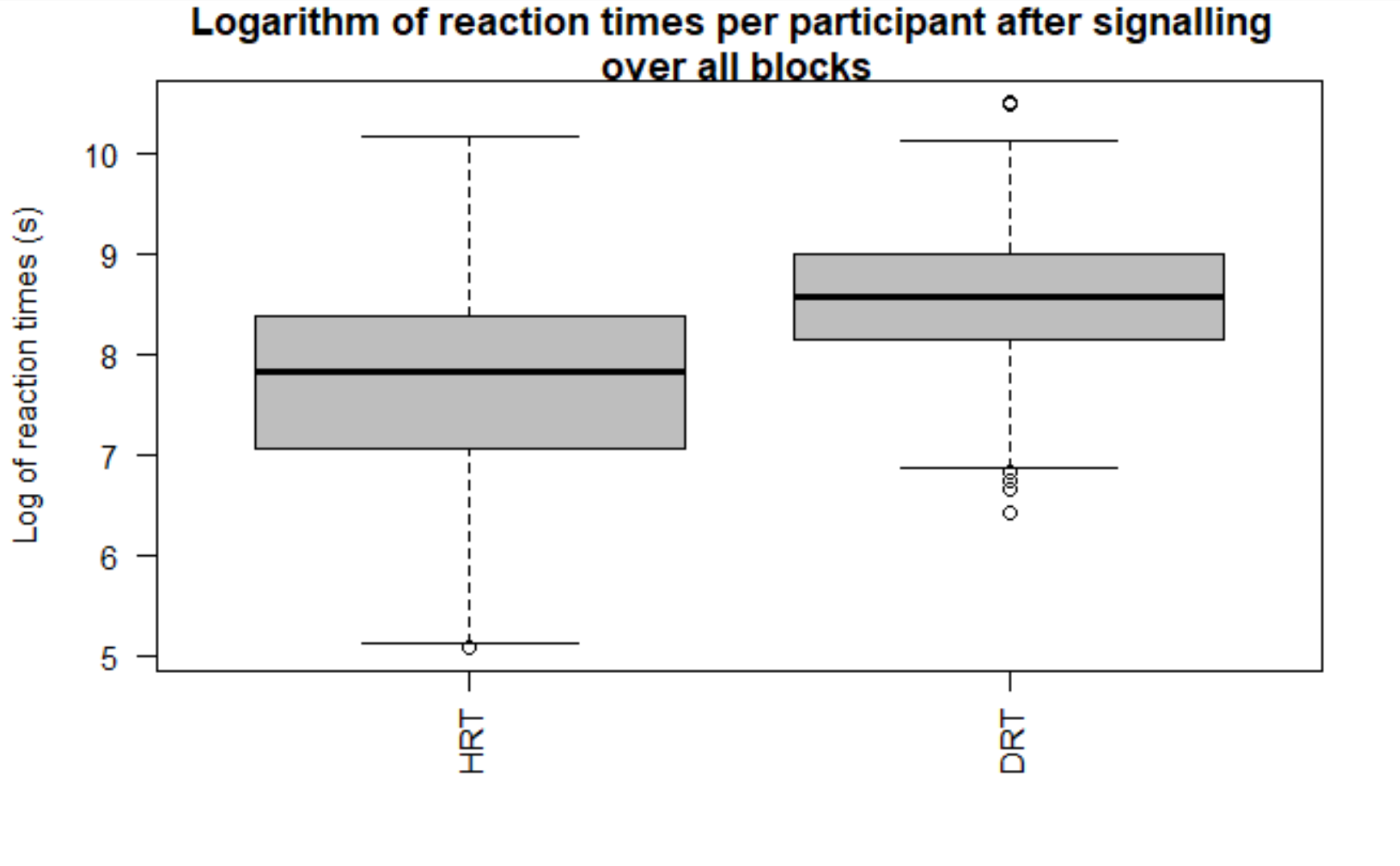
Appendix: End of block questionnaire

- Describe the strategy that you used this block.
- What did you think of the other player's strategy? Briefly describe their strategy as well.
- Rate the other player's cooperativeness, competitiveness and competence level on a scale from 1-5.
- Would you want to play with this player again? Explain briefly.

Appendix: General questionnaire

- Age/sex/study programme
- Were the instructions sufficient enough to get a proper understanding of the game?
- What was your mood like today?
- Did you have any prior knowledge about the Mod Game before the start of the experiment?
- Did you know any of the other participants that you played with in the session before the start of the experiment?
- For each block give a percentage on how confident you are that you played with a human in that block
- P-beauty contest

Appendix: Honest/dishonest reaction times



Appendix: Trust/distrust reaction times