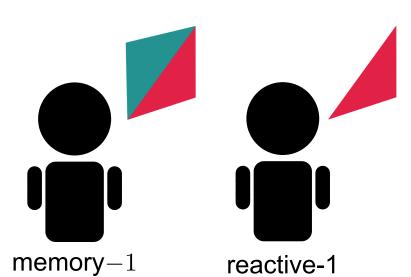


reactive-1 vs memory-1



Player 1	Player 2
$m_{CC} = 0.1$	$p_C = 0.8$
$m_{CD} = 0.6$	$p_D = 0.5$
$m_{DC} = 0.2$	
$m_{\rm DD} = 0.3$	

$m_{DD} = 0.3$

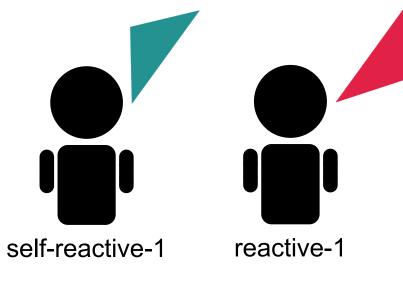
Realized Repeated Game

Player 1 DDCDD...Player 2 $C C D D \dots$

Outcome distribution

<i>C C</i> 15.3%	<i>CD</i> 10.6%
DC	DD
42.5%	31.7%

reactive-1 vs equivalent self-reactive-1



Player 1

Player 1
 Player 2

$$\tilde{p}_C = 0.304$$
 $p_C = 0.8$
 $\tilde{p}_D = 0.242$
 $p_D = 0.5$

Realized Repeated Game

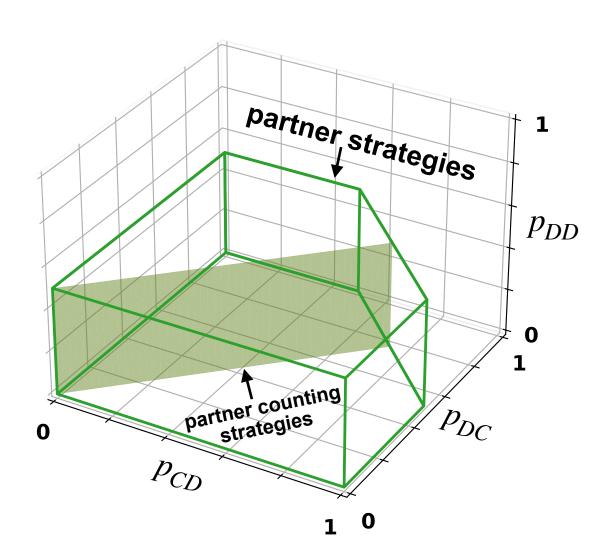
Player 1 DDCDD...Player 2 $C C D D \dots$

Outcome distribution

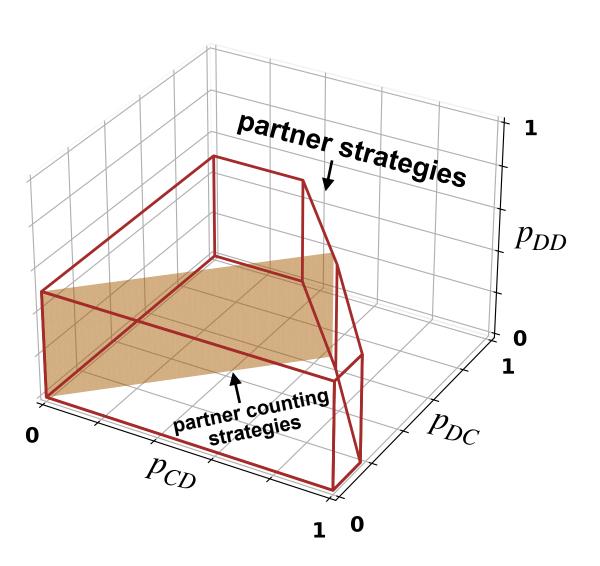
<i>C C</i> 15.3%	<i>CD</i> 10.6%
D C	DD
42.5%	31.7%

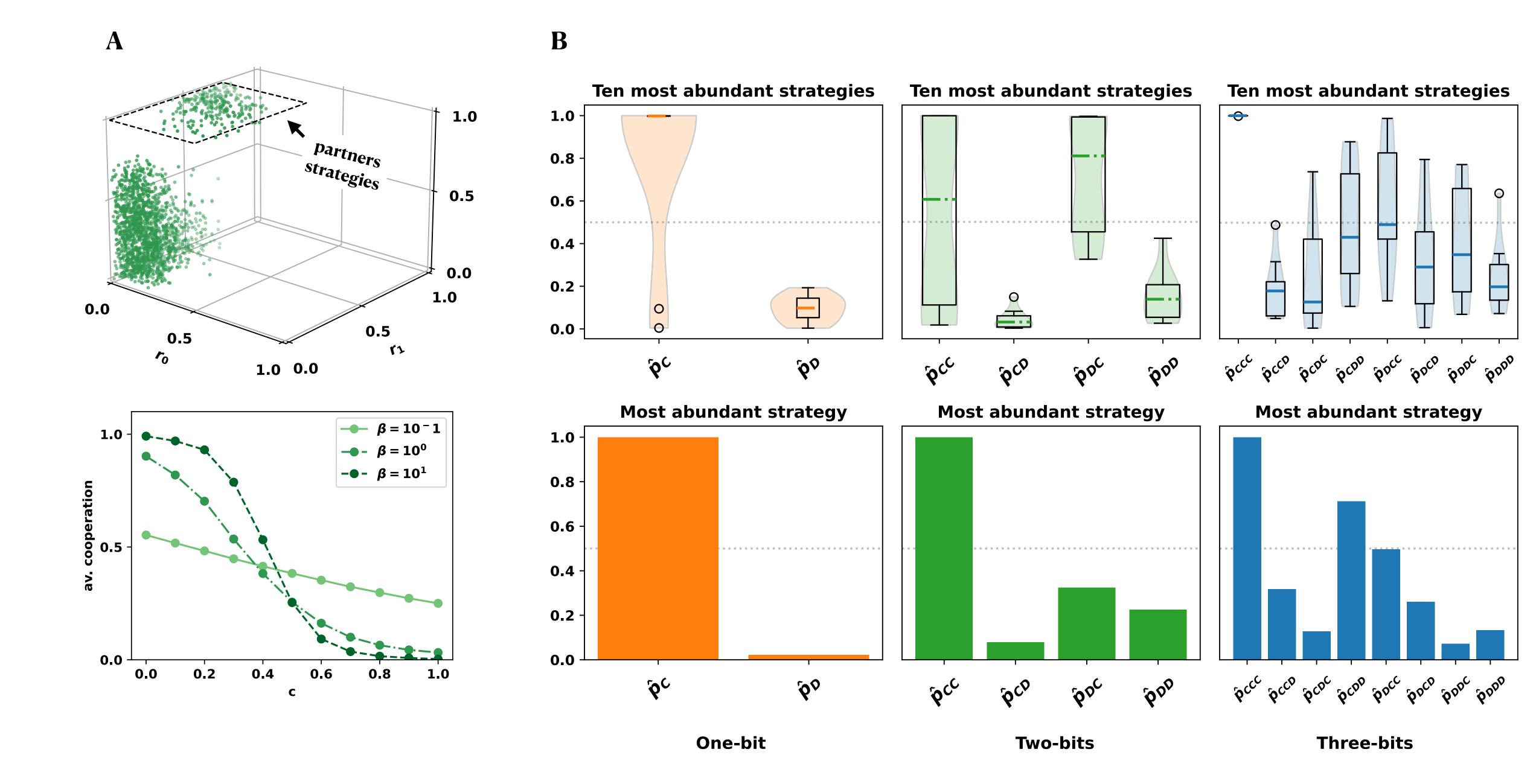
Partners among the reactive-2 strategies

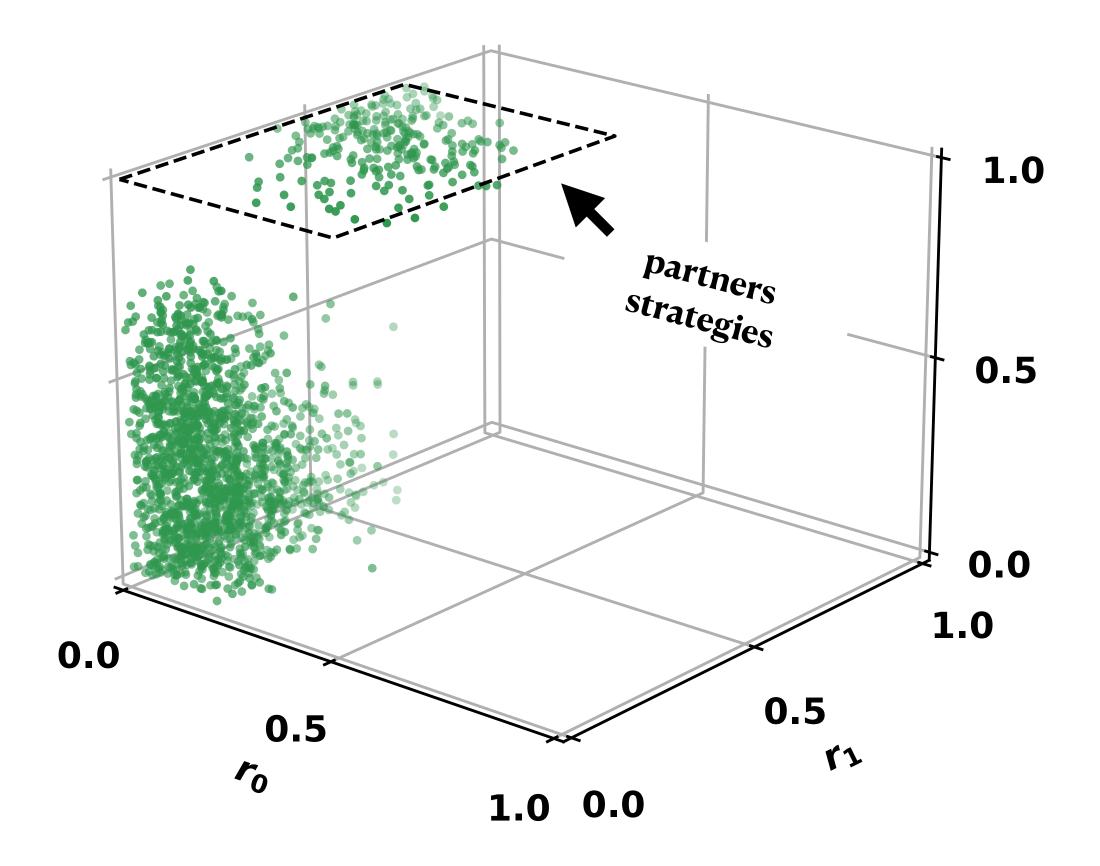
Donation Game (b/c = 2)

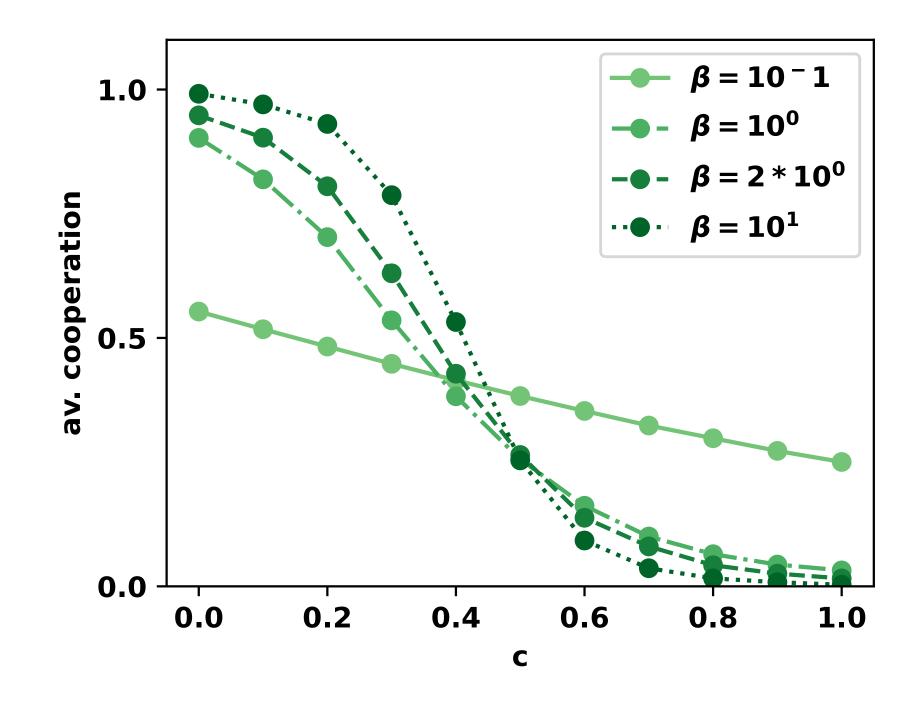


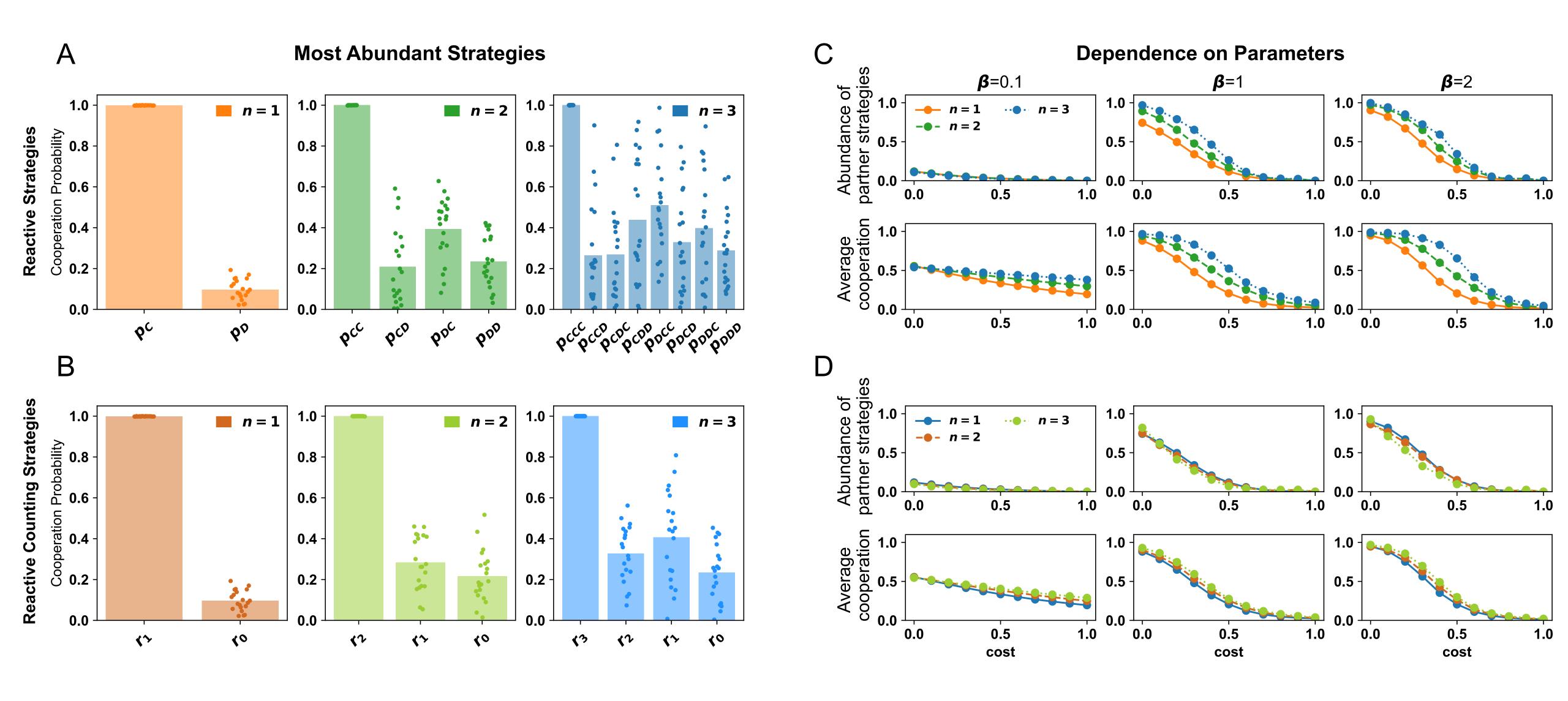
Axelrod's Prisoner's Dilemma







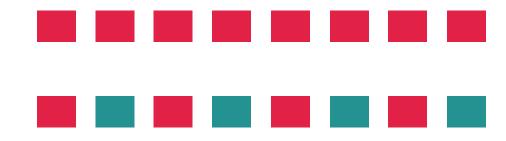




 $D \mid C$



B **Repeated Sequence**







Partner Conditions

$$p_{DD} \le 1 - \frac{c}{b}$$

$$p_{CD} + p_{DC} \le 2 - \frac{c}{b}^*$$

$$p_{DDD} \le 1 - \frac{c}{b}$$

$$p_{CDC} + p_{DCD} \le 2 - \frac{c}{b}$$

$$p_{CCD} + p_{CDC} + p_{DCC} \le 3 - \frac{c^{\dagger}}{b}$$

$$p_{CDD} + p_{DCD} + p_{DDC} \le 3 - 2 \cdot \frac{c}{b}$$

$$p_{CCD} + p_{CDD} + p_{DCC} + p_{DDC} \le 4 - 2 \cdot \frac{c}{b}$$

D **Example of deriving condition**

Sequence









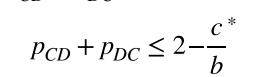
Sequence Round Payoff:

 $(p_{CD} + p_{DC}) \cdot b - c$

Partner condition:

Total Payoff:

 $(p_{CD} + p_{DC}) \cdot b - c \le 2 \cdot (b - c)$



 $p_{DC} \cdot b \quad p_{CD} \cdot b - c$

Sequence











Sequence Round Payoff:

 $p_{DDC} \cdot b$ $p_{DCD} \cdot b$ $p_{CDD} \cdot b - c$

Total Payoff:

 $(p_{DDC} + p_{DCD} + p_{CDD}) \cdot b - c$

Partner condition:

 $(p_{DDC} + p_{DCD} + p_{CDD}) \cdot b - c \le 3 \cdot (b - c)$

Equivalent condition:

 $p_{CCD} + p_{CDC} + p_{DCC} \le 3 - \frac{c^{\dagger}}{b}$

Baseline Sequence

Repeated Sequence

Partner Conditions





$$p_{DD} \le 1 - \frac{c}{b}$$

$$p_{CD} + p_{DC} \le 2 - \frac{c}{b} \ (*)$$

B

Example of deriving condition

Sequence

C









Sequence Round Payoff:

 bp_{DC} $bp_{CD}-c$

Total Payoff:

 $b(p_{CD} + p_{DC}) - c$

Partner condition:

 $b(p_{CD} + p_{DC}) - c \le 2(b - c)$

Equivalent condition:

$$p_{CD} + p_{DC} \le 2 - \frac{c}{b} \ (*)$$









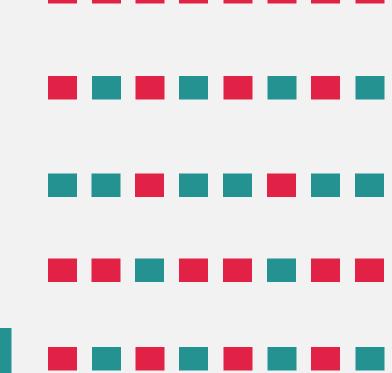












$$p_{DDD} \le 1 - \frac{c}{b}$$

$$p_{CDC} + p_{DCD} \le 2 - \frac{c}{b}$$

$$p_{CCD} + p_{CDC} + p_{DCC} \le 3 - \frac{c}{b}$$

$$p_{CDD} + p_{DCD} + p_{DDC} \le 3 - 2 \cdot \frac{c}{b} (\dagger)$$

$$p_{CCD} + p_{CDD} + p_{DCC} + p_{DDC} \le 4 - 2 \cdot \frac{c}{b}$$

Sequence







 bp_{DDC} bp_{DCD}



 $bp_{CDD}-c$

Sequence Round Payoff:

 $b(p_{DDC} + p_{DCD} + p_{CDD}) - c$

Partner condition:

Total Payoff:

 $b(p_{DDC} + p_{DCD} + p_{CDD}) - c \le 3(b - c)$

Equivalent condition:

 $p_{CDD} + p_{DCD} + p_{DDC} \le 3 - 2\frac{c}{b} \ (\dagger)$