Groups of humans and robots

Understanding membership preferences and team formation

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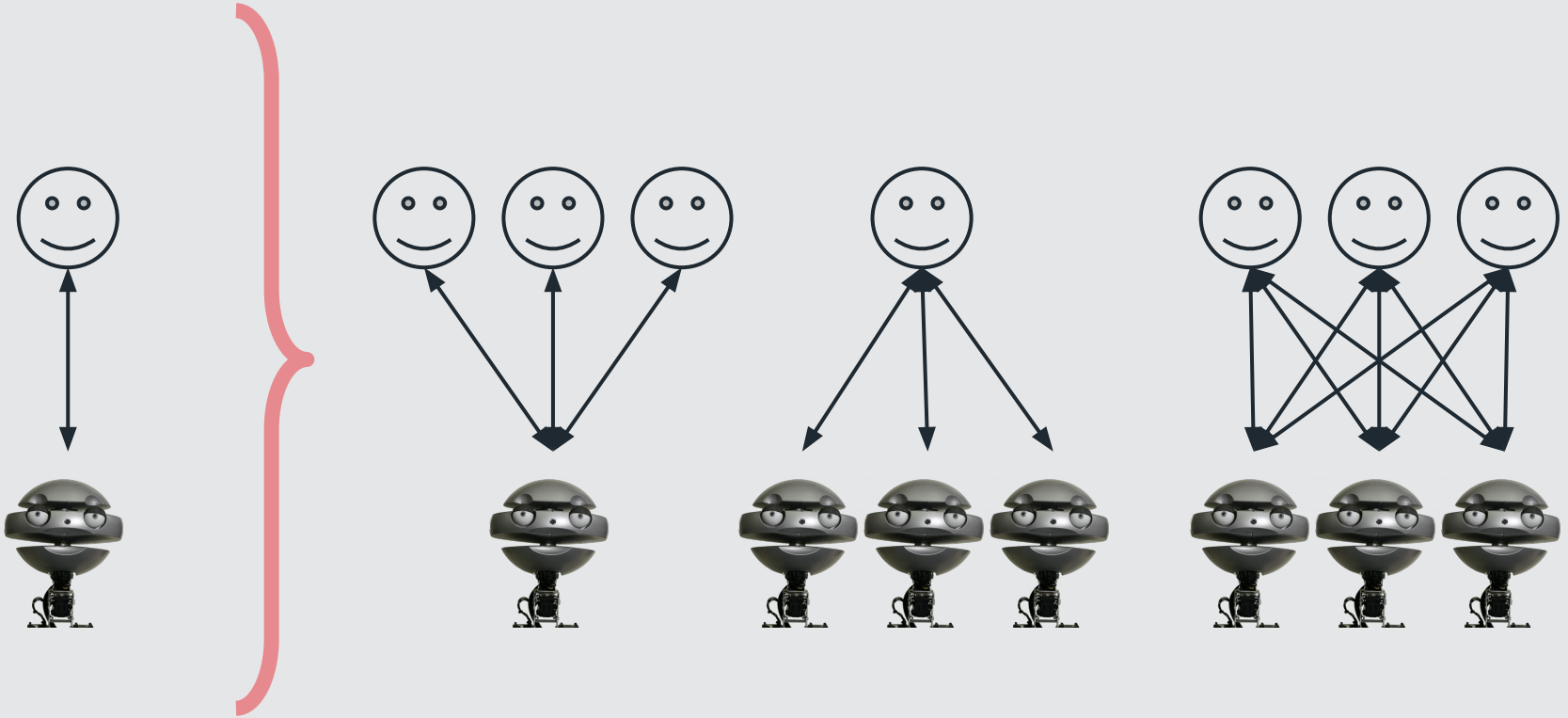
Motivation



Goals

Team formation

Membership preferences

Multi-party game context

Learning Goal Theory

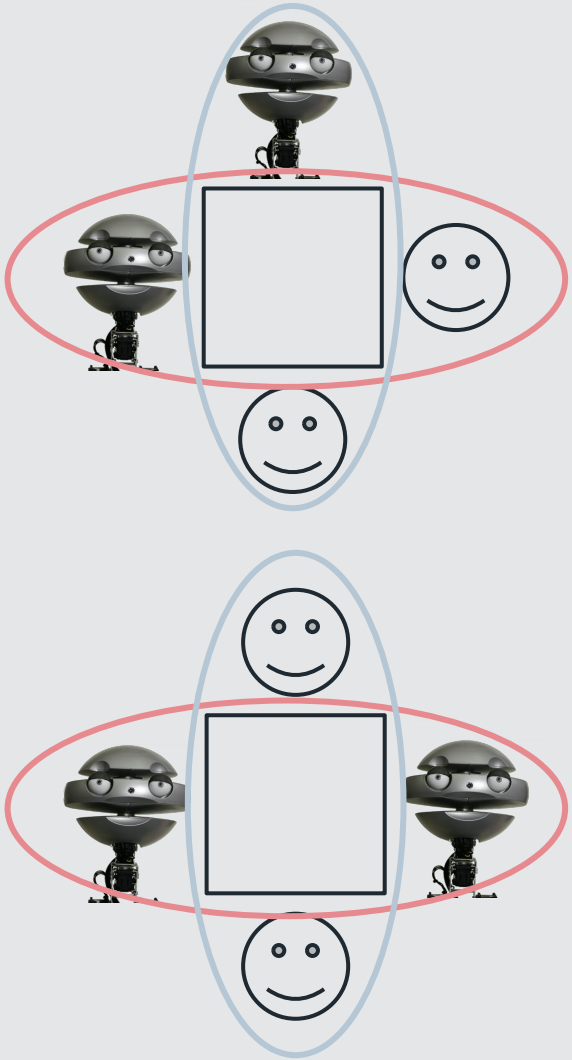
Goals

Scenario and Characters

- card game ♠♥♣♦

- 4 players
  - 2 robots (AUTONOMOUS!)
  - 2 humans

- 2 teams
  - Cooperative
  - Competitive



Learning Goal Theory

Performance-goal orientation

Learning-goal orientation

Creating two characters

Competitive

Emys

Relationship-driven

Glin

Goals

Question

Which robot will people prefer to partner with?

...and why?

How will we investigate it?

1. Development of the two characters
2. Validation for the characters behavior (Study 1)
3. Analysing preferences for team formation (Study 2)

How will we investigate it?

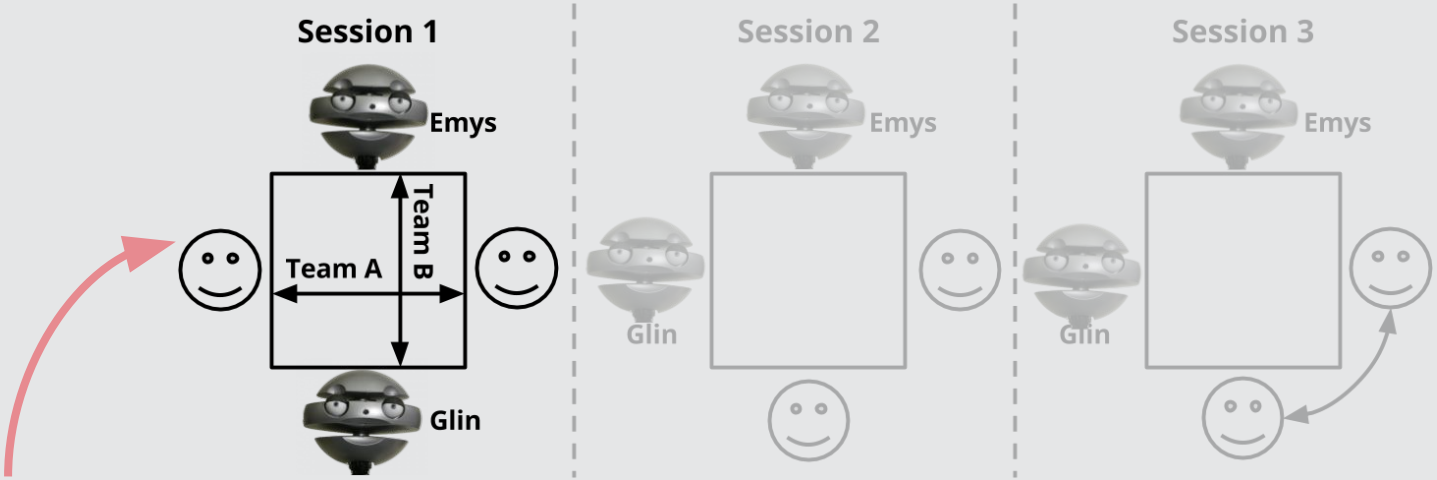
1. Development of the two characters ✓
2. Validation for the characters behavior (Study 1) ✓
3. Analysing preferences for team formation (Study 2)

Study 2

Study 2

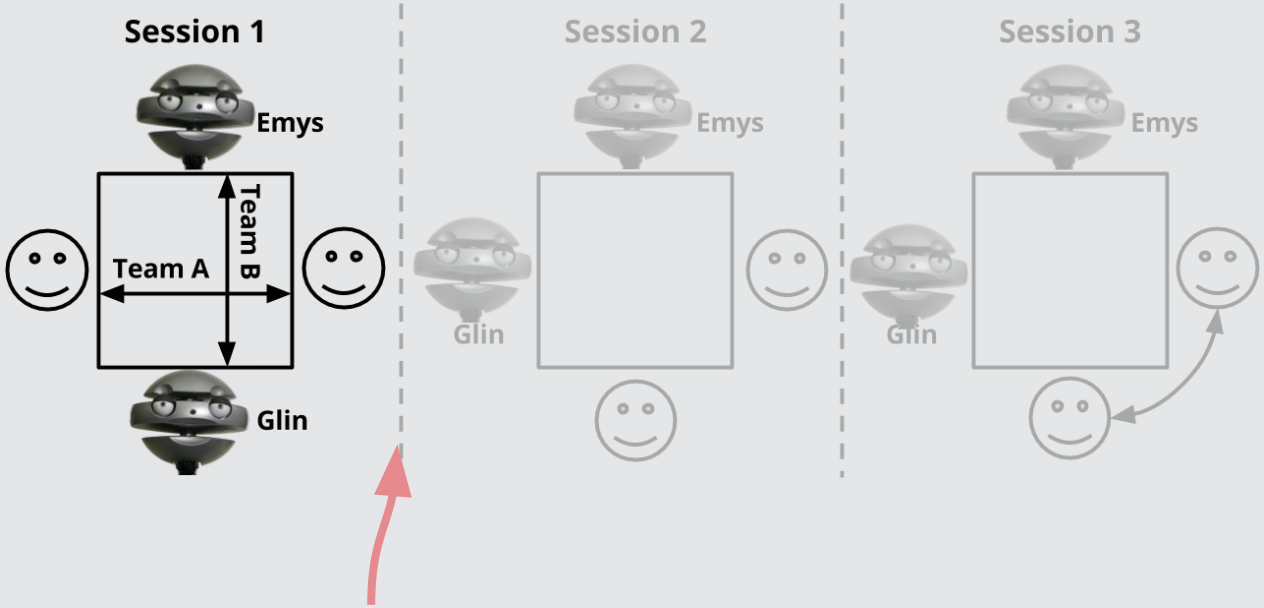
61 participants (they did not know each other)

Measures



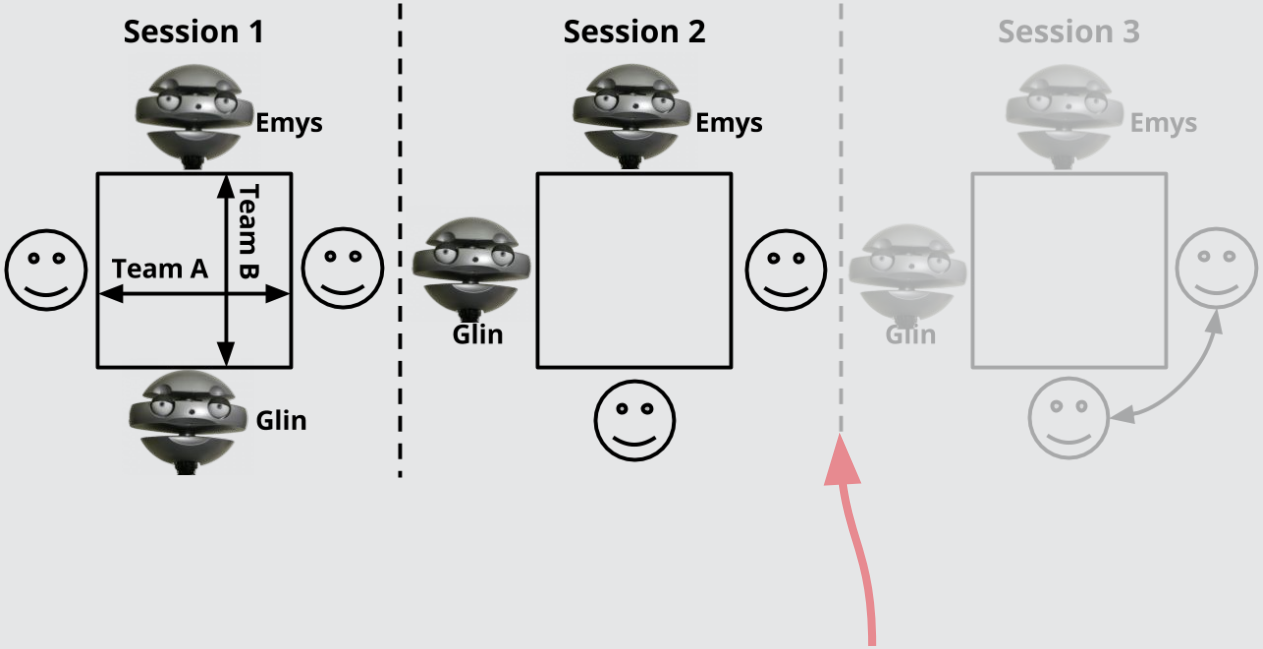
- Demographics
- Competitiveness of themselves

Measures



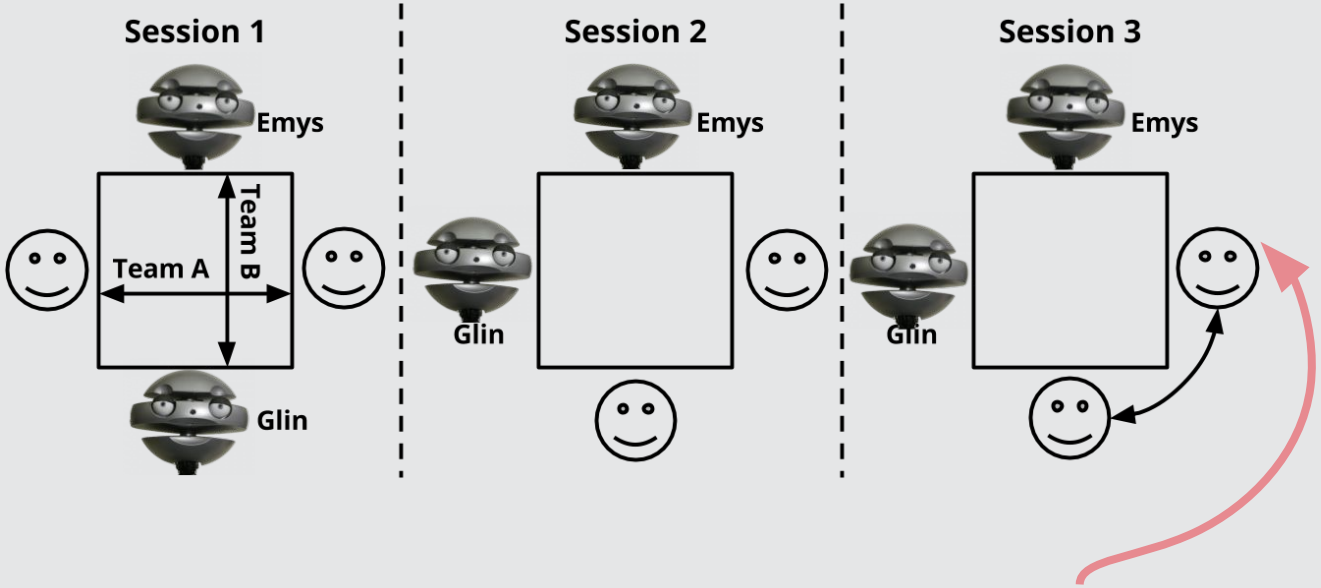
- Godspeed of both robots
- **Choosing partner (Emys or Glin)**

Measures



- Godspeed of the last partner
- McGill friendship of the last partner
- Relationship assessment of the last partner

Measures



- Godspeed of the last partner
- McGill friendship of the last partner
- Relationship assessment of the last partner
- **Choosing partner (Emys or Glin)**

Measures

If you could choose one of the robots as partner,

which one would it be?

Study 2

Results

Results - First choice of robotic partner

$X^2(1) = 4{,}267$

$p = 0{,}039$

Statistically significant difference

38 (63,3%) prefered **Glin** (relationship-driven)

22 (36,7%) prefered **Emys** (competitive)

Results - First choice of robotic partner

$t(58) = 1{,}242$

$p = 0{,}219$

Competitiveness level of participants choosing Emys

≠

Competitiveness level of participants choosing Glin

NOT Statistically significant difference

Results - Last choice of robotic partner

$X^2(1) = 1{,}667$

$p = 0{,}197$

NOT Statistically significant difference

35 prefered **Glin** (relationship-driven)

25 prefered **Emys** (competitive)

Results - Last choice of robotic partner

t(58) = 2,953

p = 0,005

Competitiveness level of participants choosing Emys

Competitiveness level of participants choosing Glin

Statistically significant difference

Results - Last choice of robotic partner

Game result of each robot

Result of Emys' team in session 2	Result of Glin's team in session 2
+ Result of Emys' team in session 3	+ Result of Glin's team in session 3
Overall game result for **Emys**	Overall game result for **Glin**

Results - Last choice of robotic partner

Game result of each robot

Fisher's exact test

p = 0,008

Statistically significant association

Last choice of robot

Results - From the first to the last choice

29 kept choice

30 changed choice

Results - From the first to the last choice

29 kept choice

Game result of each robot

Fisher's exact test

p = 0,409

NO Statistically significant association

Last choice of robot

30 changed choice

Results - From the first to the last choice

29 kept choice

30 changed choice

Game result of each robot

Fisher's exact test

p = 0,002

Statistically significant association

Last choice of robot

Conclusion

Glin was the preferred robotic partner **in the first choice**.

Before partnering with a robot...

Membership preferences in a competitive game context seemed to be influenced by the **social behaviour of the robot**.

There was no preferred robotic partner **in the last choice**.

After partnering with a robot...

Membership preferences in a competitive game context seem to be guided by **personal characteristics** and the **game result**.

We believe our findings have an **important implications** for the creation of **robot teammates** in the **HRI** field.

Thank you!

AMIOOS

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