P2-0-84

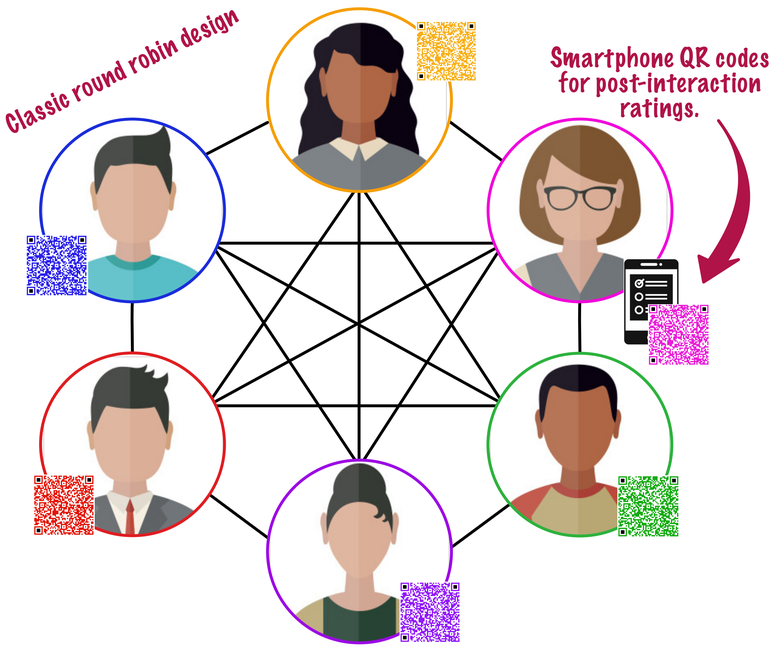
How Interactions Unfold: Pattern Detection in Natural Social Behaviour

Erin Heerey, Jeremias Campos, & Amanda Friesen
Western University

If we knew more about natural social behaviour, we could...

Challenge I: Big Data

If you want to study naturalistic social behaviour, you need to collect a lot of it.

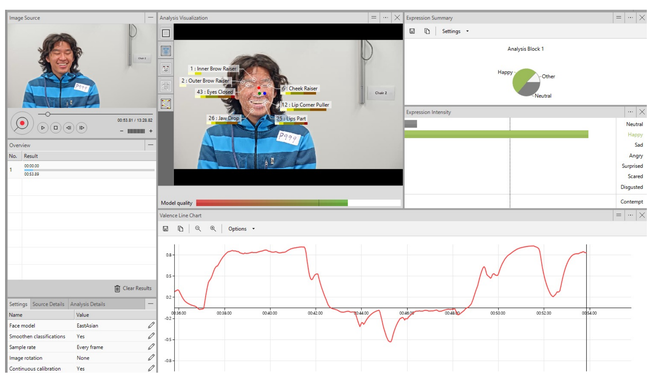


- 258 participants (in 42 groups)
  - 3 to 7 participants per group
  - 3 to 21 dyadic interactions per group
  - 12 minutes of video per interaction
- Questionnaires
  - Personality, attitude, demographic
  - Post-interaction ratings

Challenge II: Face Coding

Behavioural coding is expensive and labour intensive.*

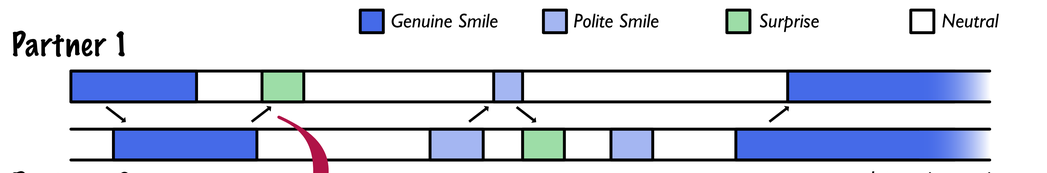
- We used Noldus FaceReader 9.1 (www.noldus.com)
  - Automatically codes action units + composite expressions
  - Exported at 15 frames per second (~67ms per frame)



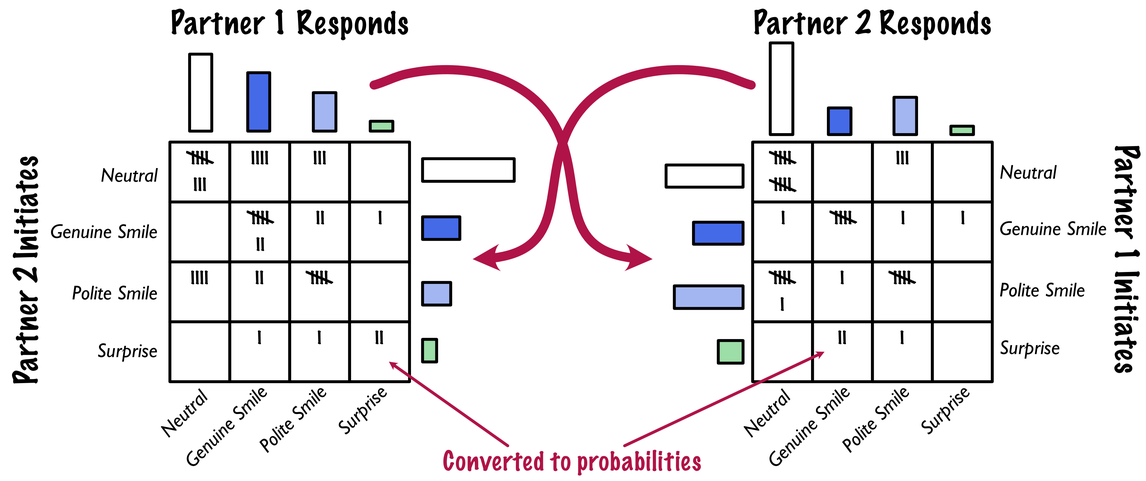
* Behaviour coding is ongoing (data plots include groups 1-27)

Challenge III: Pattern Detection in Unique Interactions

Patterns are difficult to detect because interactions unfold over time and in a variable way.



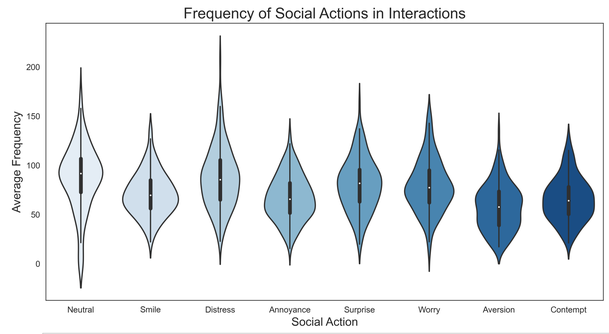
Studying the action transitions across partners may help researchers extend beyond behavioural frequency counts.

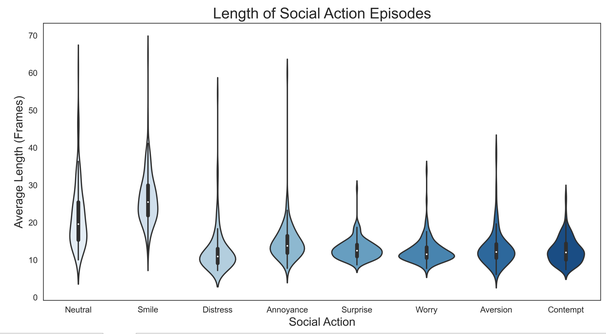


Innovation

Examining transition probabilities breaks the dependence on time.

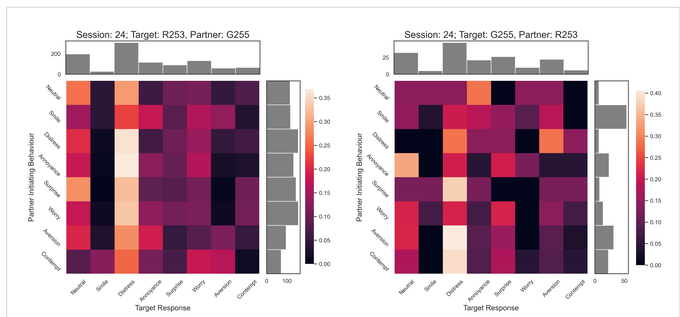
- A target's behaviour becomes 'conditionally independent' of time
- It depends only on the partner's previous action
- Allows patterns of social exchange to emerge



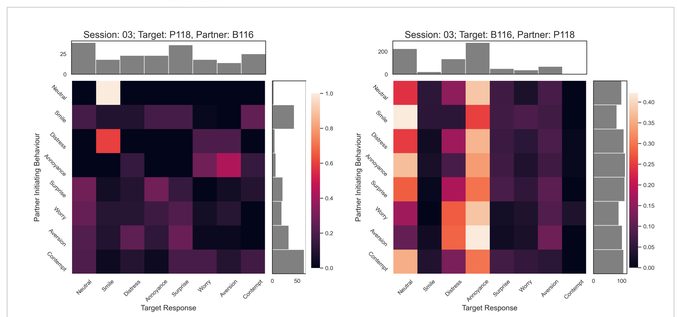


Action Composites

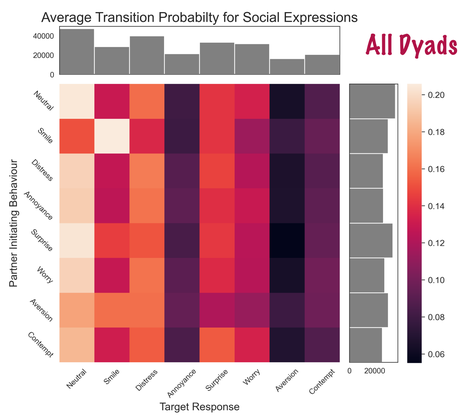
Smile = AU06 + AU12
Distress = AU01 + AU04 + AU15
Annoyance = AU04 + AU05 + AU07 + AU23
Surprise = AU01 + AU02 + AU05 + AU26
Worry = AU01 + AU02 + AU05 + AU20 + AU26
Aversion = AU09 + AU15 + AU16
Contempt = AU12 + AU14



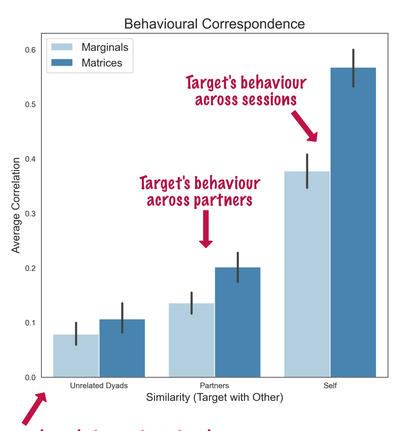
Example of good social coordination (r = .49)



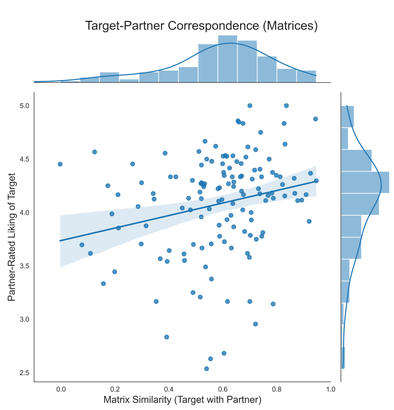
Example of poor social coordination (r = -.07)



Average correlation in sample: r = .28 (SD = .42)



Correspondence between target and participants' behaviour in unrelated sessions



1 Redcay, et al., 2010. Neuroimage. doi: 10.1016/j.neuroimage.2010.01.052
2 Špiláková, et al., 2019. SCAN. doi: 10.1093/scan/nsz004
3 Molokwu, et al., 2020. Computational Science. doi: 10.1007/978-3-030-50433-5_15
4 Schilbach, et al., 2011. SCAN. doi: 10.1093/scan/nsq067