Is implicit mentalising "social"? Investigating the domain-specificity and developmental trajectory of implicit mentalising

North West Social Science Doctoral Training Partnership

Economic and Social Research Council

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Introduction

- **Implicit mentalising**: Automatic awareness of others' perspectives.
- Occurs even when detrimental to task-performance; e.g., Visual perspective-taking.
- **Joint Simon Effect** (**JSE**): Spatially-defined response to non-spatial stimuli features (spatial compatibility effect; **SCE**) is stronger in Joint Simon (task-sharing) vs. Individual go/no-go task.
- Result of implicit mentalising during task-sharing, re-establishing SCE?
- Hotly debated: Is JSE driven by social domain-specific mechanisms, or non-social, domain-general processes?
- No consensus in literature; possible insight from examining ***what* is being co-represented** during task sharing, operationalised through an adapted Joint Simon and incidental memory tasks?

Research Aims

1. Validate if adapted Simon Task elicits JSE.
2. Examine contents of co-representation.
3. Test if individual differences in executive function (EF), receptive vocabulary, and explicit mentalising affect JSE magnitude.
4. Investigate developmental trajectory of the JSE between 3.5 to 5 years.

Participants

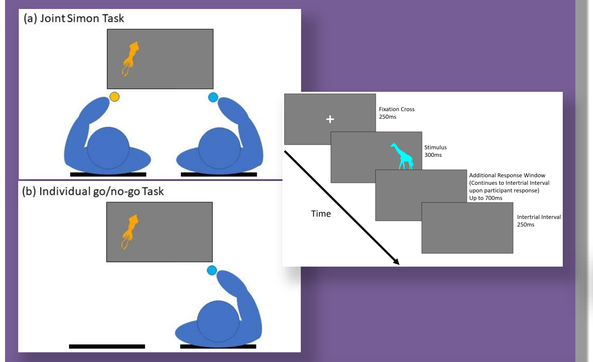
Study 1: Undergraduate students, $N = 52$ ($M = 18.80$ years, $SD = 2.32$; 40 females)

Study 2: 3.5- to 5-year-old children, $N = 62$ (In Progress)

Study 3: Undergraduate students, $N = 42$ (In Progress)

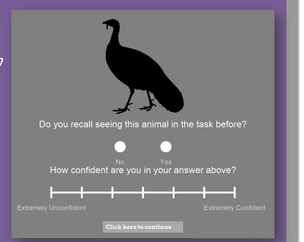
Phase 1: Adapted Simon Task

- Participants are assigned one colour (blue/orange) to respond to, regardless of stimuli location (left/right).
- Critical novel manipulation: Replaced typical Simon task geometric stimuli with unique sets of coloured animal silhouettes (blue/orange).
- 2 between-pt (**Task Condition**:. Joint vs. Individual) x 2 within-pt (**Compatibility**: Compatible vs. Incompatible) design.
- Measured *Response Time (RT)* as the DV.



Phase 2: Surprise Recognition Task

- Asked if participants recall seeing certain animal silhouettes appearing in the Phase 1 (new silhouettes were mixed in as foils).
- 2 between-pt (**Task Condition**:. Joint vs. Individual) x 2 within-pt (**Colour Assignment**: Self-assigned vs. Other-assigned) design.
- Measured *Recognition Accuracy* as DV – Proxy for degree of incidental processing & encoding of stimuli in the Simon task.

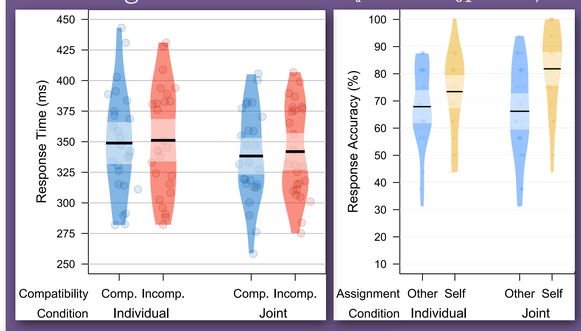


Study 1: Hypotheses

1. Stronger Compatibility effect in Joint than Individual Condition (i.e., JSE).
2. Better Recognition Accuracy of Other-assigned (vs. Self-assigned) stimuli in Joint than Individual Condition.

Study 1: Key Adult Results

1. No significant Task Condition x Compatibility interaction (p=.273, BF_{01}=31.25).
2. Unexpected (Inversed to Hypo. 2) Task Condition x Assignment interaction (p=.039, BF_{01}=6.494).



Study 1: Conclusions

- Present study did not elicit the JSE – possibly due to experimental alterations, and/or changes to analyses methods.
- This prevents us from drawing confident conclusions about JSE's domain-specificity.
- Bayesian evidence indicates that Joint Condition participants did not recognise Other-assigned stimuli more accurately than participants in the Individual Condition.
- This implies that participants were no more likely to encode content from their partner's perspective during the Joint task.
- Nonetheless, the present study pushes methodological boundaries regarding the elicitation of co-representation in the Joint Simon task & demonstrates the potential utility of a surprise recognition task.

Study 2: Child Study Design

- Similar paradigm to Study 1, but also testing for effects of individual differences in:
  1. Age (continuous variable)
  2. Explicit mentalising (Wellman & Liu, 2004)
  3. Executive Function (task-switching; Zelazo, 2006)
  4. Receptive vocabulary (BPVS; Dunn & Dunn, 2009)
- Examine if Study 1 result pattern holds in children, at critical ages for explicit Theory of Mind/mentalising development.
- Bolster limited literature of JSE in children.

Study 2: Hypotheses

1. Same hypotheses 1 & 2 as in Study 1.
2. If implicit mentalising is underlaid by the 4 individual differences above, *Phase 1* JSE magnitude and *Phase 2* partner-stimuli encoding be will significantly moderated by said individual differences.

Study 3: Adult Replication Study

- Test methodological boundaries of JSE elicitation.
- Examine the replicability & robustness of the JSE.
- Direct replication of *Phase 1* paradigm + "traditional" Simon task paradigm (i.e., revert to geometric shapes instead of animals).
- Entirely within-participant design to facilitate stronger statistical comparisons.

Study 1 Registered Report

Paradigm Demo Video