

A Social Synchrony Task for Evaluating Differences in Social Connectedness

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Introduction

- When people interact, they unintentionally synchronize their movements (Richardson et al., 2007).
- People on the autism spectrum have a harder time interacting with others socially (McNaughton & Redcay, 2020).

GOAL: Examine social factors that affect interpersonal synchrony through an interpersonal movement task and measures of social connectedness.

Methods

- Pairs of 18 undergraduate student participants

Interpersonal movement task (Schmidt & Turvey, 1994) : Participants swung a pendulum with their partner in three different conditions:
unintentional: swinging at their own pace (*always first*)
in-phase: swinging in the same direction
anti-phase swinging in opposite directions (*order counterbalanced*)



Angle of each participant's wrist tracked with a goniometer

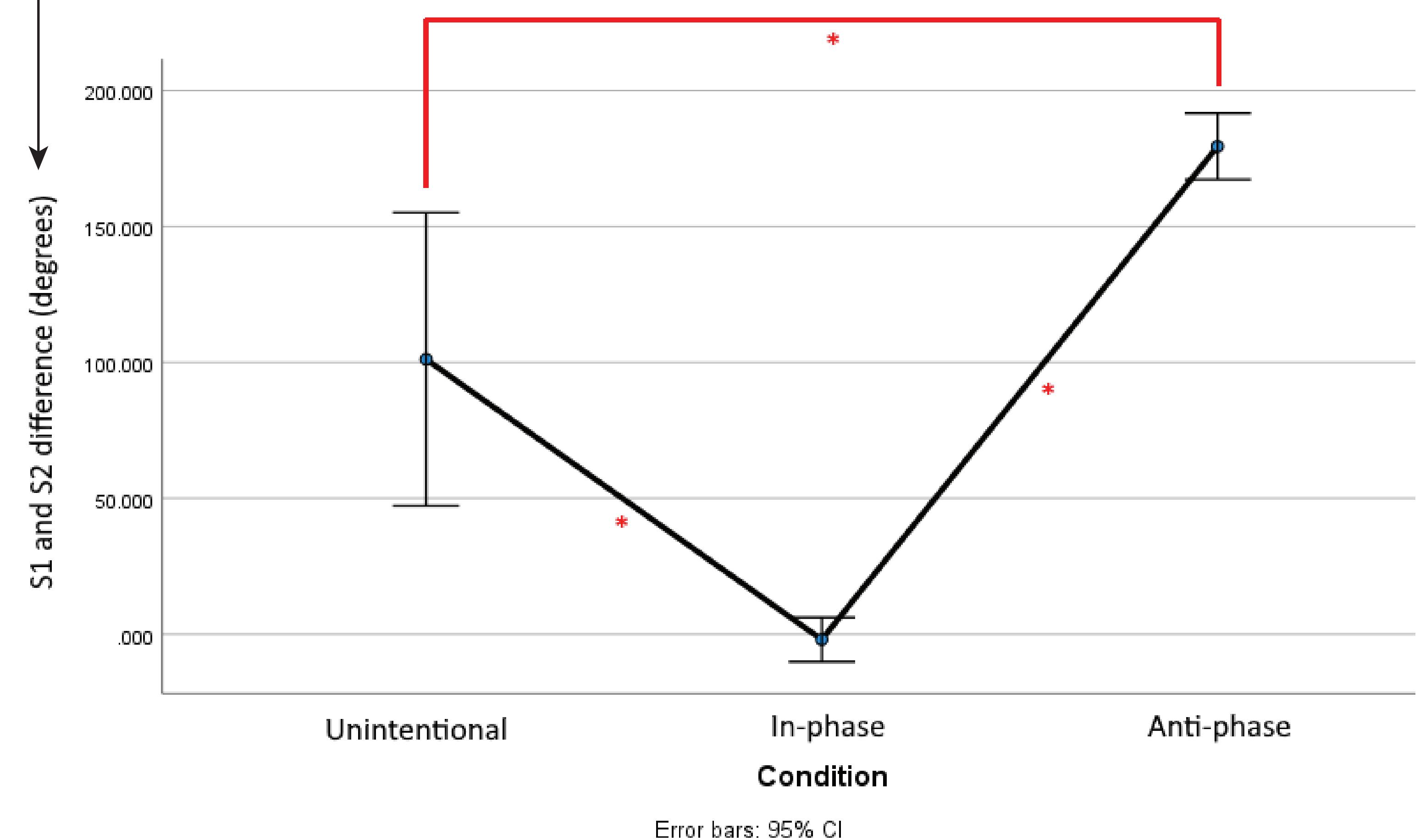
(Fitzpatrick et al., 2019)

Autism Spectrum Quotient (Baron Cohen et al., 2001) : A diagnostic tool that measures traits typical of an autistic person. Higher scores (out of 50) indicate a greater presence of autistic traits. Five subscales (each out of 10) were measured: **Social Skills, Attention Switching, Attention to Detail, Communication, and Imagination**.

Inclusion of Other in the Self (Aron, 1992) and **Inclusion of Community in the Self** (Mashek et al., 2007) : Each consisted of a single question with Venn diagrams. Each circle was labeled "Self" and either "Other" or "Community," with varying levels of overlap in each option. Higher scores (from 1 to 7) indicate higher social connectedness.

There may be a connection between **interpersonal movement** and perceptions of social connectedness.

Relative phase: average difference between the angle of each participant's pendulum - how synchronized they are.



References

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Results

- Significant difference between unintentional, in-phase, and anti-phase relative phases.
 - Unintentional: 101°; in-phase: -2°; anti-phase: 179°
 - Higher standard deviation in unintentional condition
 - In-phase and anti-phase are close to 0° and 180°, respectively**, whereas unintentional had more variation as participants were not instructed to synchronize
- Relative phase means in 20° segments:
 - Large prop of in-phase swinging in 0°-20° range
 - Large prop of anti-phase swinging in 160°-180° range
 - Wider distribution of time spent across segments for unintentional condition, but gravitation toward in-phase
 - Suggests a **natural tendency to synchronize**

Unintentional Relative Phase vs. IOS Score: $r(17) = -.47, p = .05$

Anti-Phase Period vs. ASQ Imagination Component: $r(17) = -.48, p = .04$

- Significant negative correlation between **unintentional relative phase and IOS score**
 - Participants who perceive themselves as **more detached from others** have a **weaker tendency to naturally synchronize**
- Significant negative correlation between **anti-phase period and Imagination component of the ASQ**
 - Pairs lower in imagination may have to slow down to synchronize their movement

Discussion

- Findings indicate a possible connection between interpersonal movement and perceptions of social connectedness.
- Future research is warranted to validate these findings and incorporate EEG into this design to evaluate the neural networks that underlie social synchrony (Fitzpatrick et al., 2019; Modarres et al., 2022).