Visual-spatial reasoning performance under social observation and collaboration: a tangram-based task

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BACKGROUND

Visual-spatial reasoning (VSR), the ability to grasp meanings of spatial relations among multidimensional objects, plays a role in various cognitive processes

Its examination during interindividual conditions offers insights into the interplay between cognitive abilities in various social settings

AIM

Validating a tangram-based task to study the impact of social observation and cooperation on perceived difficulty and anxiety

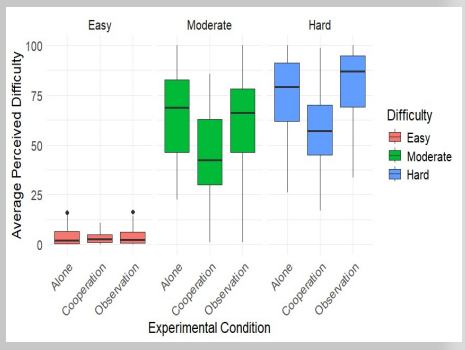
METHOD

- **64** young adults aged between 18 and 25 years old (M_{age}= 21.03±1.97; female = 59.4%; right-handedness = 77%). Data collection still in progress
- Participants solved tangrams under 3 social conditions (i.e., alone, observed, cooperation) in 3 difficulty levels (i.e., easy, moderate, hard) in pseudo-randomised order. After each tangram, participants rated their Perceived difficulty (0 – 100) and Anxiety (0 – 100)
- Preliminary, we ran two linear mixed model (**LMMs**) on **perceived difficulty** and **perceived anxiety**, with **social condition** and **task difficulty** as fixed effects, including their interaction, while accounting for individual differences with random intercepts for each participant.

RESULT

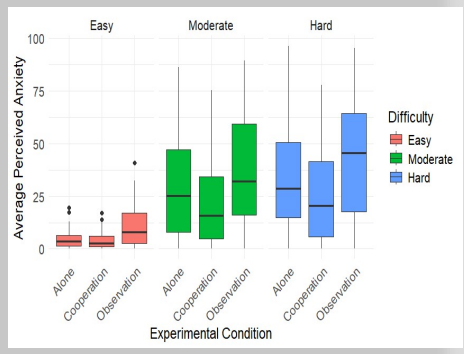
PERCEIVED DIFFICULTY

- The difficulty level was significant, with significant moderate [β = 55.2 (SE = 2.97, t(403.50) = 18.611, p < .001)] and hard [β = 60.4 (SE = 3.39, t(415.05) = 17.814, p < .001)] condition coefficients, referenced to the easy level.
- The social conditions' effect was not significant, and the hard-cooperation was found different from hard-alone and hard-observation (both p<.001).



PERCEIVED ANXIETY

- Being observed is linked to higher perceived anxiety [β = 6.92 (SE = 1.62, t(485.73) = 4.27, p < .001) while cooperating to lower levels of perceived anxiety as compared to performing alone [β = -6.24 (SE = 1.62, t(485.73) = -3.84, p < .001]
- The difficulty level had a significant effect on both levels (moderate and hard). More anxiety is experienced at higher levels of difficulty.



DISCUSSION and CONCLUSION

Participants were impacted by the **manipulated difficulty**, in terms of **perceived difficulty** and **anxiety**. For hard tangrams, cooperation but not observation had an impact on perceived difficulty. Moreover, the social conditions seem to impact the solver's anxiety levels. Participants experienced **more anxiety** while being **observed** and less while **cooperating**.

More insights will be gathered when modelling the participant's state and trait (social) anxiety.