

Mehran Sahandi Far^{1,2}, Johannes Eckert^{1,2,4}, Kristina Meier-Böke^{1,2,4}, Jona Fischer¹, Mamaka Narava^{1,2}, Simon B. Eickhoff^{1,2}, Leonhard Schilbach^{3,4}*, Juergen Dukart^{1,2}*

¹Institute of Systems Neuroscience, Heinrich Heine University Düsseldorf, Düsseldorf, Germany;
²Institute of Neuroscience and Medicine (INM-7: Brain and Behaviour), Research Centre Jülich, Jülich, Germany
³Munich Center for Neurosciences, Ludwig-Maximilians-Universität München, München, Germany
⁴Psychiatry, LVR-Klinikum Düsseldorf – Kliniken der Heinrich-Heine-Universität Düsseldorf, Düsseldorf, Germany
* contributed equally

Introduction

Autism Spectrum Disorder (ASD) is a complex neurodevelopmental condition characterized by:

- Challenges in social communication and learning
- Restricted interests and repetitive behaviours
- Impaired social interactions and repetitive/restricted behaviours

challenges in social interaction, language, anxiety, and social isolation contribute to **distinct communication styles** in autistic individuals.

Digital Written Communication and Their Impact on ASD

- Digital communication technologies like email and chatbots offer Digital tools like email and chatbots aid self-expression and reduce social anxiety for those with ASD.
- Preference for text-based communication enhances self-consciousness and expression, benefiting healthcare, education, and well-being, and reducing social isolation.

Research Limitations:

- Reliance on clinical observations or self-reporting can be biased by recall bias, self-awareness, and limited ecological validity.

Digital Biomarkers (DBs):

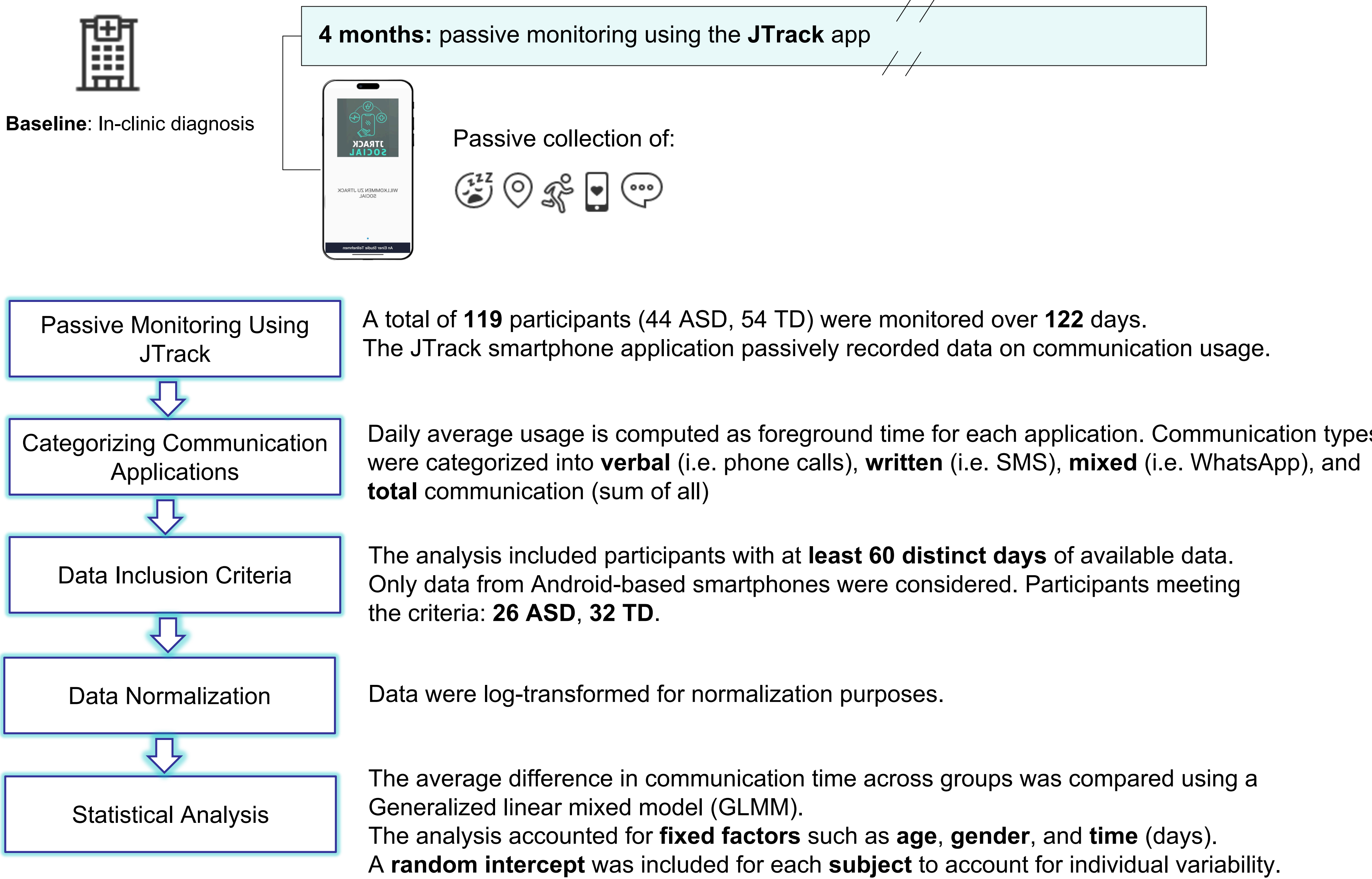
- Smart technologies can address these limitations by directly monitoring smartphone communication preferences and providing ecologically valid insights.

Study Objective:

- Use smartphone-derived data to objectively assess communication preferences within the ASD population, aiming to inform tailored monitoring, communication, and support strategies.

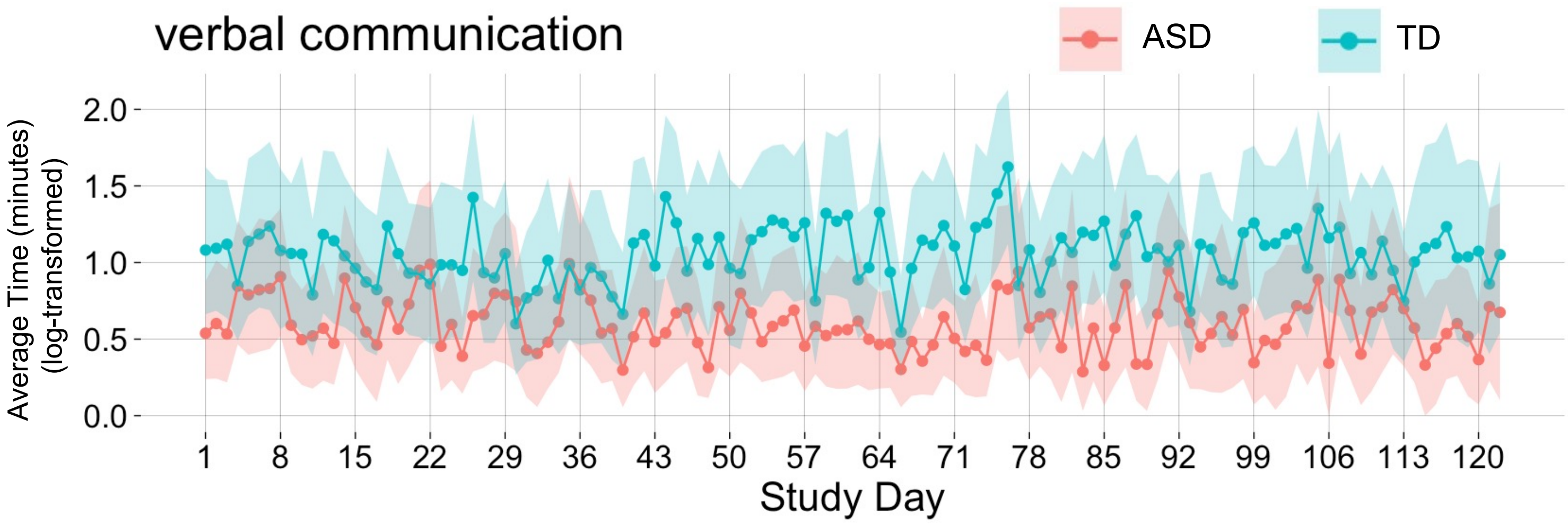
Methods

The study passively monitored **44 ASD** and **54 TD** participants ((Mean \pm SD) ASD: 32.8 \pm 12.0, TD: 35.8 \pm 15.4) for **122 days** using the "JTrack Social" app to analyze daily communication patterns

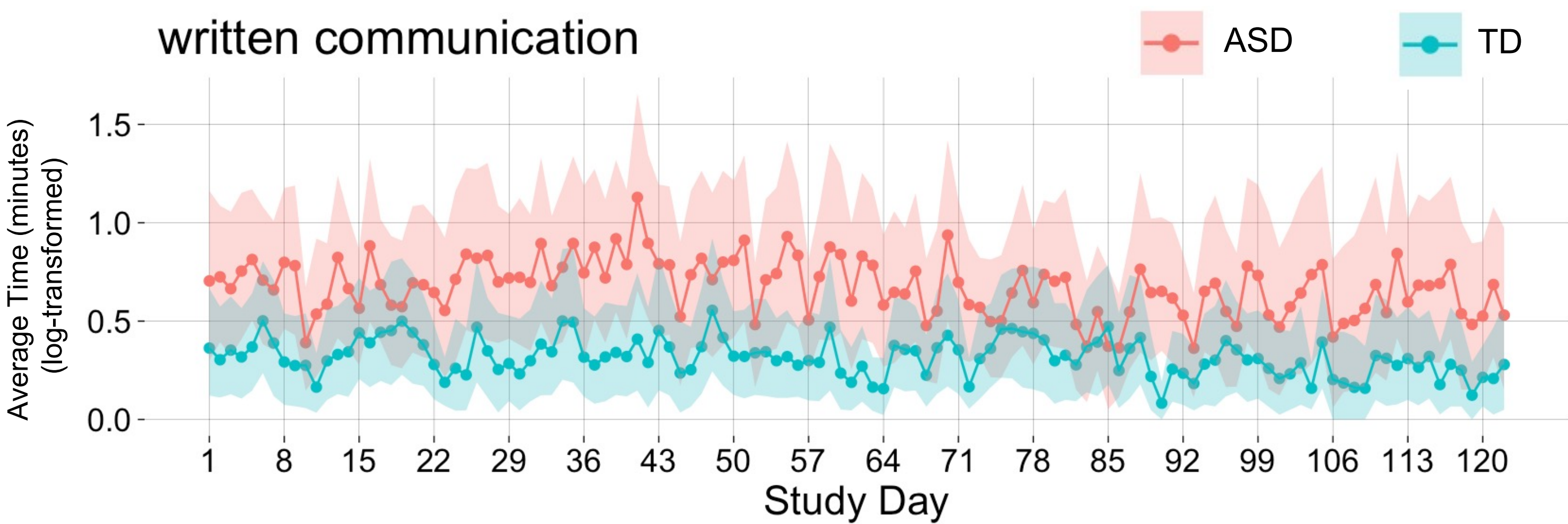


Results

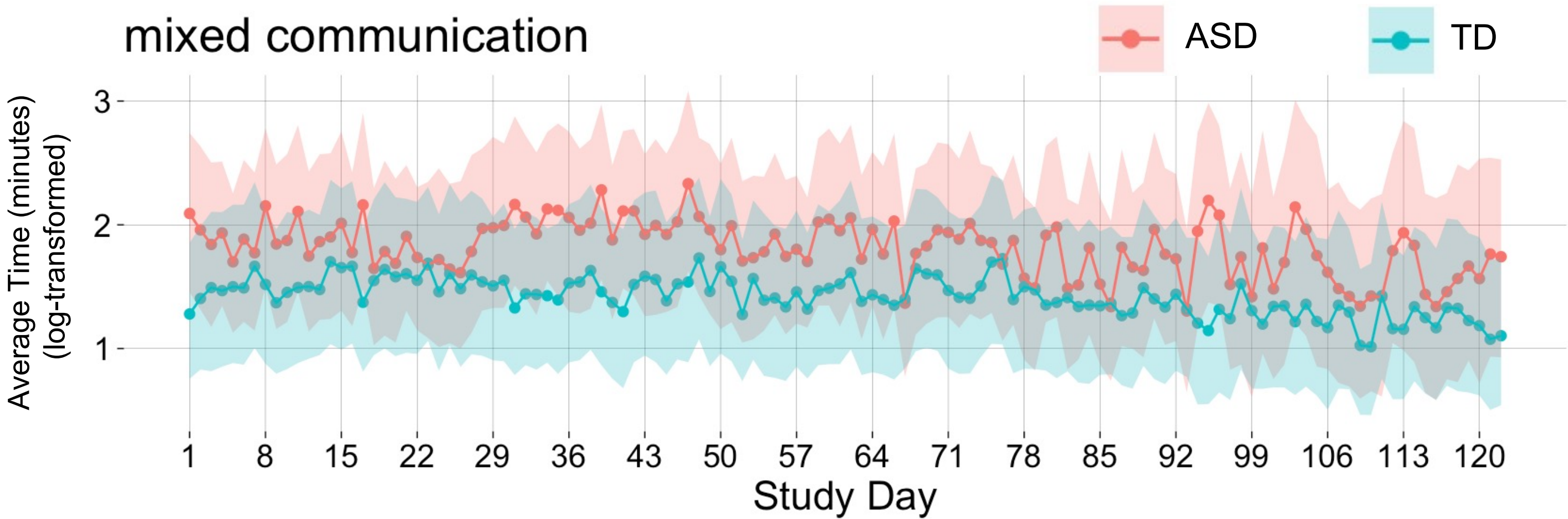
Participant Data: 58 participants with data for ≥ 60 days (32 ASD, 26 TD). **Total Communication Preferences:** No significant differences in total or mixed communication usage ($p=0.39$ and $p=0.21$). **Verbal Communication:** Higher daily usage in TD group ($p=0.002$). **Written Communication:** Higher daily usage in ASD group ($p<0.001$). **Stability of Preferences:** No significant effects of age or time on communication preferences.



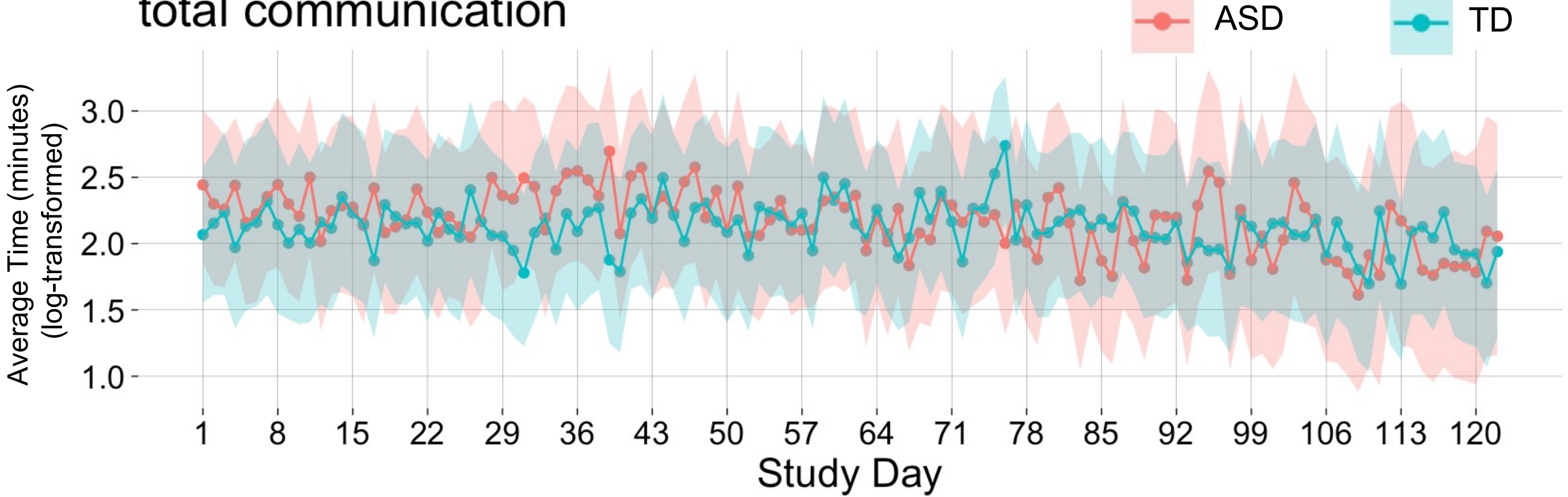
significantly **reduced** verbal communication time in ASD



significantly **increased** written communication time in ASD



No differences



No differences

Discussion & Conclusion

Insights: DBs provide high-resolution, ecologically valid insights into the communication preferences of ASD individuals. Findings support the preference for text-based communication.

Implications: Personalized communication and support plans enhance social outcomes, educational experiences, and well-being for ASD individuals through tailored interventions.

Future Directions: Incorporating diverse communication methods in intervention strategies and utilizing DBs can significantly enhance the understanding and support of neurodevelopmental conditions such as ASD.

Conclusion: Our study provides objective and real-world evidence for altered communication patterns in individuals with ASD using smartphone data. These findings inform tailored communication and support strategies, fostering more inclusive and effective support for individuals with ASD.

JTrack Ecosystem

