

# Physiological measurements of stress preceding incidents of challenging behavior in people with severe to profound intellectual disabilities and their caregivers: A series of single-case studies.

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## People with severe to profound intellectual disabilities

- Deficits in intellectual and adaptive functioning
- Difficulties with skills needed in daily life
- Limited communication
- Dependency on others
- Co-morbid medical conditions
- Residential care



## Challenging behavior



- Common types: aggression, self-injury
- Severity and prevalence increases with severity ID
- Intensive and complex support needs
- Not a characteristic of the person, but dependent on cultural norm and social context



*Culturally abnormal behavior(s) of such intensity, frequency or duration that the physical safety of the person or others is placed in serious jeopardy, or behavior which is likely to seriously limit or deny access to the use of ordinary community facilities.*

(Emerson, 1995)





# The importance of stress in clients and caregivers

## Client stress

### Stress-attachment theories

- Frequent, intense and sustained stress experiences
- Lack coping skills
- Dependent on support from attachment figure to cope with stress
- Challenging behavior to cope with stress

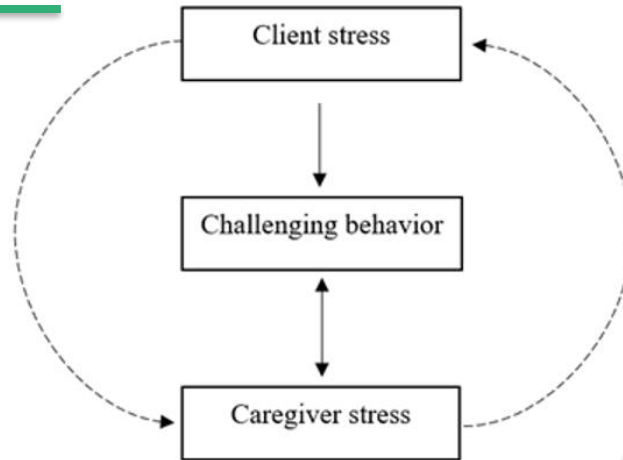


Figure 1. A hypothesized reciprocal model of stress and CB in caregivers and people with SPID.

## Caregiver stress

- Challenging behavior as stressor
- Negatively affects quality of support
- Absenteeism, turnover, sickness
- Impact on challenging behavior

## Physiological indicators of stress



- Difficulties in communicating stress experiences
- Wearables to measure stress in real-life settings
- Empatica E4 measures:
  - Electrodermal activity (EDA)
  - Blood volume pulse
  - Heart rate (from inter-beat-interval)
  - Skin temperature
  - Movement

Figure 2. Empatica E4 Wristband



## Research questions

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**1**

Do patterns of physiological stress in the 30 minutes preceding incidents of CB differ from control periods of 30 minutes without CB?

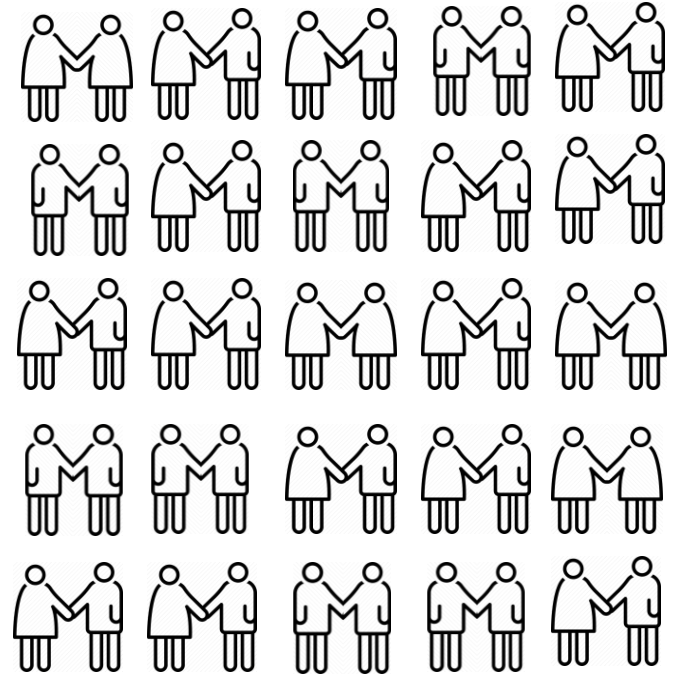
**2**

Do caregivers' physiological stress levels impact clients' physiological stress levels, and vice versa, do clients' physiological stress levels impact caregivers' physiological stress levels?

# Methodologies



- Series of 15 single-case studies
  - Focus on micro-processes within individuals
  - Real-life context
- 20 sessions of 3 to 8 hours
- Outcome measures
  - Physiological stress
  - Challenging behavior
  - Client mood
  - Caregiver self-reported stress

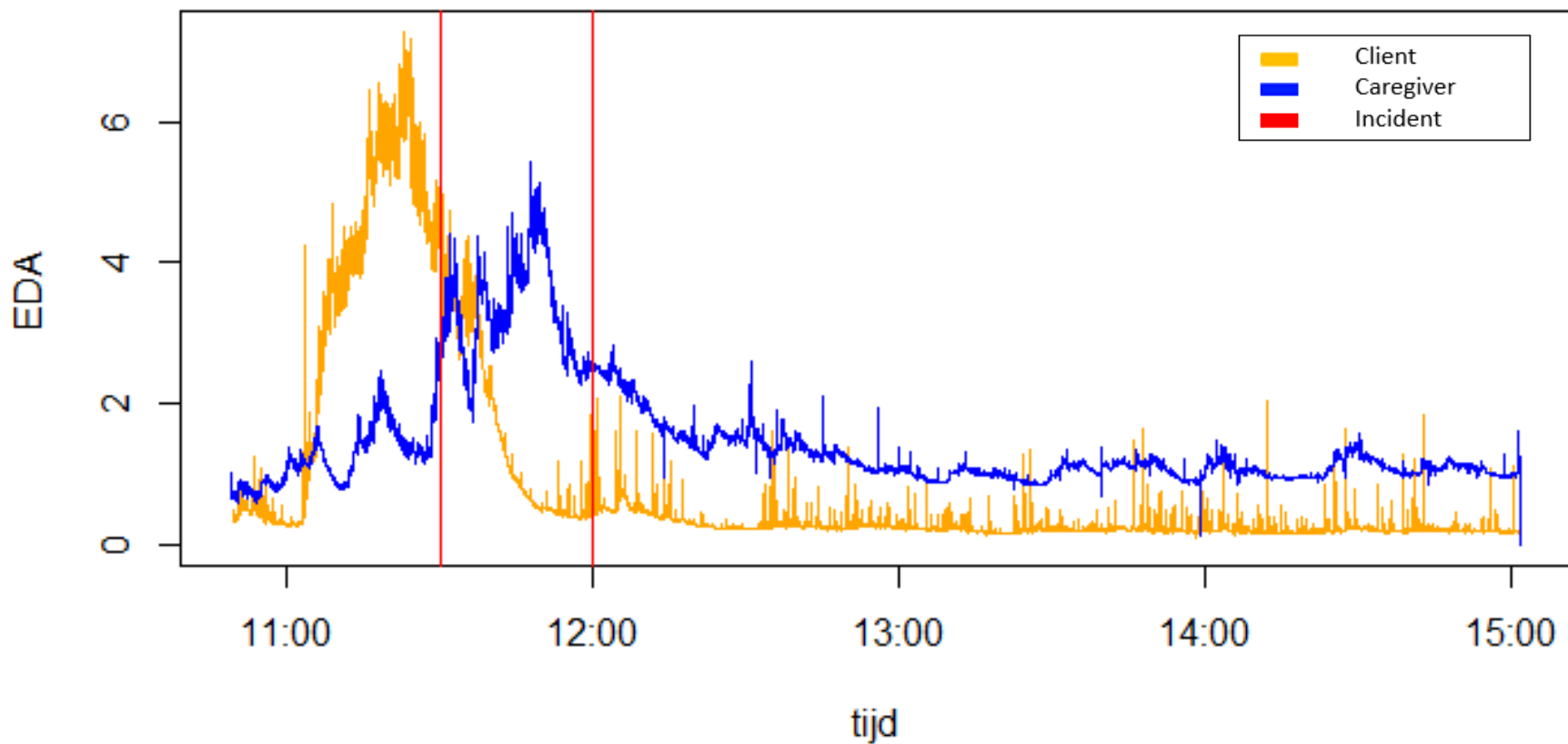




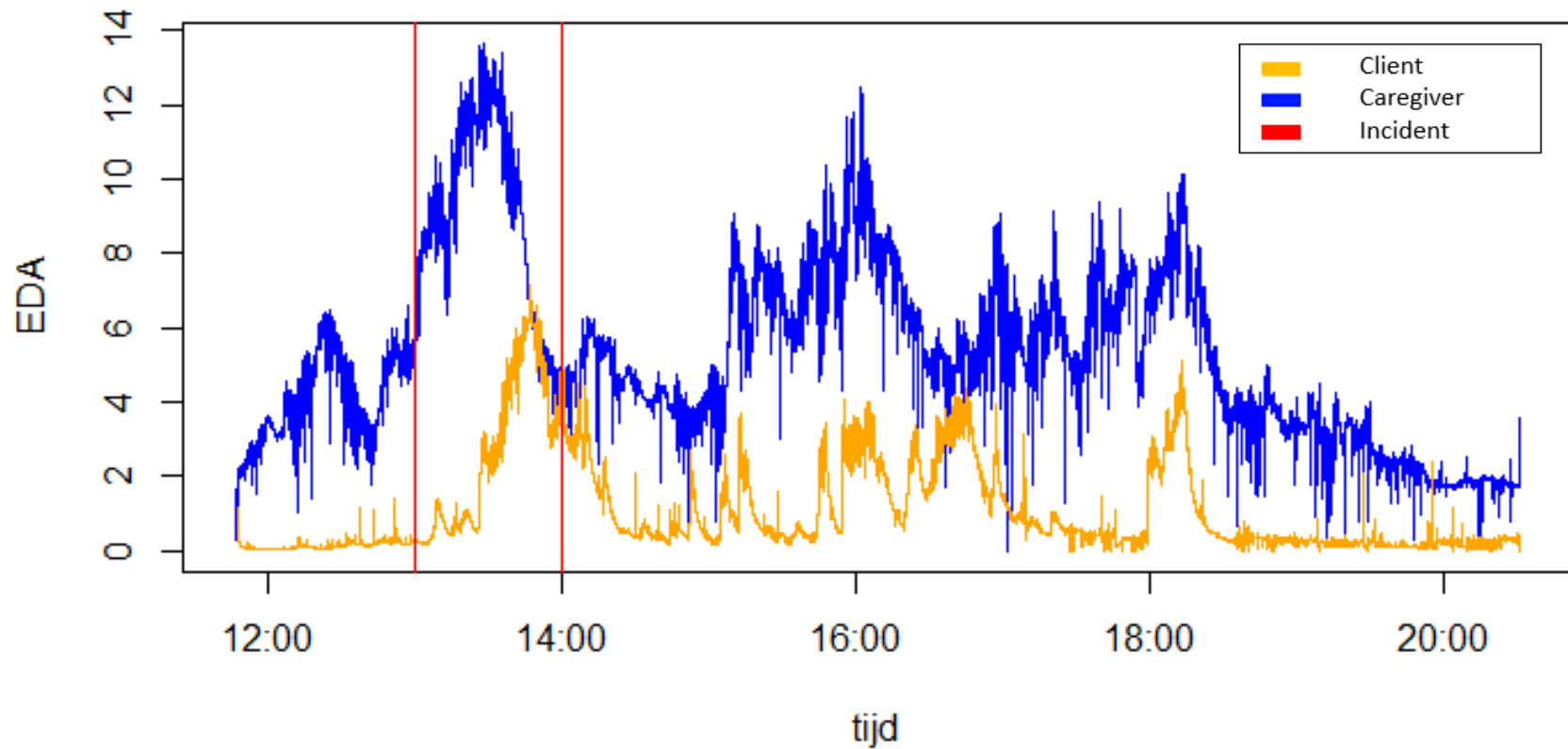
# Preliminary results



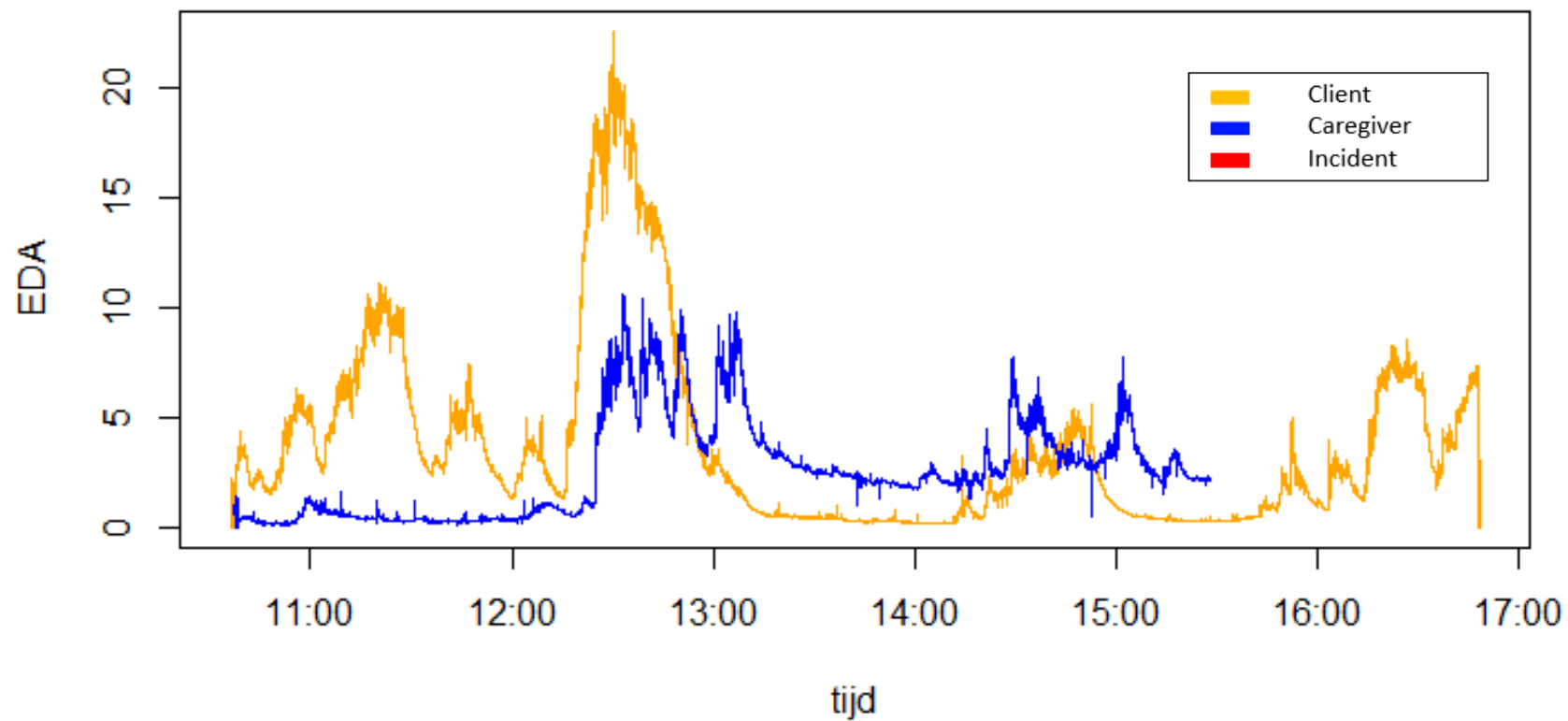
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## Visual analysis



- Different stress patterns preceding challenging behavior
- Different 'leader and follower' relationships
- Statistical analyses needed to reveal patterns and leader-follower relationships!



## Next steps

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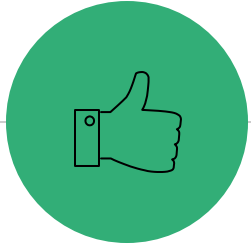
- Measuring stress in 10 more dyads
- Statistical analyses (longitudinal multilevel modelling and cross-recurrence quantification analysis)
- Writing up results and conclusions

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## Protocol paper



Simons MAG, Koordeman R, De Looff PC, Otten R. Physiological measurements of stress preceding incidents of challenging behavior in people with severe to profound intellectual disabilities: A study protocol of a series of single-case studies. JMIR Res Protoc. 2021; DOI: 10.2196/24911



# Thanks!

## *Any questions or remarks?*

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## Resources

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