Data Request form YOUth (version 3.0, September 10, 2019)

Introduction
The information you provide here will be used by the YOUth Data Management Committee to evaluate your data request. Details on this evaluation procedure can be found in the Data Access Protocol.

Moreover, your data request will be stored in an online repository available to all researchers who submit or have submitted a data request. The aim of this repository is to provide a searchable overview of past, current, and pending data requests. By default, we will publish the following information from your request on our researcher's website:
- After submission of a data request: the names and institutions of the contact person and participating researchers (**Section 1**) and the research context (**Section 2**).
- After approval of a data request: the complete request (**Section 1-5**).
  Exception: If you believe that publishing the complete request could do harm (e.g. when you propose to use a novel analysis technique) you can object to publishing the complete request. This should be indicated on the data request form with a rationale (**Section 5**). The YOUth Data Management Committee will review your matter and advise the YOUth Executive Board whether or not to publish the complete request. If you do not agree with the YOUth Data Management Committee about publishing the complete request, you have the possibility to withdraw your data request.

Section 1: Researchers
In this section, please provide information about the researchers involved with this data request.
- Name, affiliation and contact information of the contact person
- Name and details of participating researchers (e.g. intended co-authors)
- Name and details of the contact person within YOUth

Contact person for the proposed study:	
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Contact person for the proposed study:	
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Contact person for the proposed study:	

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Contact person for the proposed study:	
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+ for other participating researchers

Contact person in YOUth Data Management Committee:	
Name:	Chantal Kemner
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Section 2: Research context

In this section, please briefly describe the context for your research plans. This section should logically introduce the next section (hypotheses). As mentioned, please note that this section will be made publicly available on our researcher's website after submission of your request.
Please provide:
-   The title of your research plan
-   A very brief background for the topic of your research plan
-   The rationale for and relevance of your specific research plan
-   The specific research question(s) or aim(s) of your research (Please also provide a brief specification)
-   A short description of the data you request
References can be added at the end of this section (optional).

Title of the study
Is the Tobii Pro Spectrum a suitable replacement for the Tobii TX300 in a large cohort study?

Background of the topic of your research plan, rationale, relevance (max. 500 words)
The Tobii Pro TX300 is a popular eye tracker in developmental research (some example studies are: Falck-Ytter, 2015; Falck-Ytter, Carlström & Johansson, 2015; Gomez, Piazza, Jobert, Dehaene-Lambertz, & Huron, 2017). It is also the eye tracker used in the YOUth cohort study. However, this specific eye tracker has been discontinued by the manufacturer. Should one of the TX300's in the YOUth cohort break down, it cannot be replaced and another eye tracker will have to be used. In this study we ask how the Tobii Pro Spectrum eye-tracker, which is marketed by Tobii Pro as the replacement of the Tobii Pro TX300, compares to the TX300 in terms of data quality. As differences in data quality may cause invalid conclusions to be drawn on experimental outcomes (especially on the individual level, see Hessels & Hooge 2019), studying the potential differences between the eye trackers is therefore crucial for the YOUth study, but also other (prospective) longitudinal studies. We further discuss notable differences in usability between the two systems.

The specific research question(s) or aim(s) of your research
Is the Tobii Pro Spectrum a suitable replacement for the Tobii Pro TX300 in a large cohort study? We compare the Tobii Pro Spectrum with the Tobii Pro TX300 in terms of eye tracking data quality and usability.

Summary of the data requested for your project: Please indicate which data you request to answer your research question.
All the data from the gap-overlap experiment performed with the Tobii Pro Spectrum, and the same number (matched on ages) of the gap-overlap performed with the Tobii Pro TX300.

References (optional)
Falck-Ytter, T. (2015). Gaze performance during face-to-face communication: A live eye tracking study of typical children and children with autism. *Research in Autism Spectrum Disorders,* 17, 78-85. Falck-Ytter, T., Carlström, C., & Johansson, M., (2015). Eye Contact Modulates Cognitive Processing Differently in Children with Autism. *Child development,* 86*(1),* 37-47. Gomez, A., Piazza, M., Jobert, A., Dehaene-Lambertz, G., & Huron, C., (2017). Numerical abilities of school-age children with Developmental Coordination Disorder (DCD): A behavioral and eye-tracking study. *Human Movement Science,* 55, 315-326. Hessels, R.S., & Hooge, I.T.C., (2019). Eye tracking in developmental cognitive neuroscience – The good, the bad and the ugly. *Developmental Cognitive Neuroscience,* 40. Hessels, R.S., Niehorster, D.C., Kemner, C., & Hooge, I.T.C., (2017). Noise-robust fixation detection in eye movement data: Identification by two-means clustering (I2MC). *Behavior Research Methods,* 49*(5),* 1802-1823.

Section 3: Hypotheses

In this section, please provide your research hypotheses. For each hypothesis:
- Be as specific as possible
- Provide the anticipated outcomes for accepting and/or rejecting a hypothesis (or explain why this does not apply to your project, e.g. when using Bayesian statistics)

Exception: if you plan a hypotheses-free project, please use this section to explain why you don't formulate specific hypotheses.

Hypotheses
The Tobii Pro Spectrum is considered to be a suitable replacement for the Tobii Pro TX300 if (1) the eye-tracking data quality for the Spectrum is at least as good as for the TX300 and (2) doesn't suffer from severe usability issues that would prevent it from being used with children.

Section 4: Methods

In this section, you should make clear how the hypotheses are tested. Be as specific as possible. Please describe:
- The study design and study population (Which data do you require from which subjects?)
- The general processing steps (to prepare the data for analysis)
- The analysis steps (How are the data analysed to address the hypotheses? If possible, link each description to a specific hypothesis)

- Any additional aspects that need to be described to clarify the methodological approach (optional)

Study design, study population and sample size (e.g. cross-sectional or longitudinal; entire population or a subset; substantiate your choices)

We request all the gap-overlap datasets performed with the Tobii Pro Spectrum: 5m 18, 10m 38 and 3y 20 datasets.

We will compare these with the same number (matched on age) of gap-overlap datasets performed with the Tobii Pro TX300. However, we request 500 datasets from each age group (5m, 10m and 3y) since we will randomly sample the corresponding number of sets for each age group a hundred times and calculate the different measures (see general processing steps) within every sample. This way, we can create a baseline with which we can compare the data quality of the Tobii Pro Spectrum.

General processing steps to prepare the data for analysis

Eye-tracking data quality is often described by *accuracy*, *precision* and *data loss*. We will derive measures for each of these from the eye-tracking data.
Accuracy refers to the error between the assumed true gaze location and the gaze location as reported by the eye-tracker.
Precision refers to the ability of the eye-tracker to reliably reproduce a measurement, from one sample to the next, assuming a stable true gaze position.
Data loss refers to the percentage of unreported samples where samples were expected to be reported.

Specific processing and analysis steps

For the accuracy we will calculate the error between the *assumed true* gaze location and the *reported* gaze location.
The assumed true gaze location will be defined as the location of the fixation dot at the beginning of each trial. Within each trial this dot is the visual stimulus with the smallest diameter, lending itself best for defining the assumed true gaze location.
For the reported gaze location, we will employ the I2MC algorithm (Hessels, Niehorster, Kemner & Hooge, 2017) to determine fixation location closest to the assumed true gaze location during presentation of the fixation dot.

For precision we will calculate the root mean square sample-to sample deviation in the reported gaze location when the assumed true gaze location remains the same.

For data loss we will calculate the proportion of samples in each trial for each eye for which no gaze coordinate was determined.

Additional methodological aspects (optional)

We will discuss potential usability issues or differences between the Tobii Pro Spectrum and the Tobii Pro TX300.

Section 5: Data request

In this section, please specify as detailed as possible which data (and from which subjects) you request. Include information regarding:

- Which wave(s)
- Which experiments, questionnaires, etc.
- How many sets (sample-size)
- Purpose of your data request
- Other aspects relevant to your data request (optional).

Select the appropriate wave(s) (more options are possible):

☐ Rondom zw – 20 weeks
☐ Rondom zw – 30 weeks
☒ Rondom 0 – 5 mo
☒ Rondom 0 – 10 mo
☒ Rondom 3 (not available yet)
☐ Rondom 6 (not available yet)
☐ Rondom 9
☐ Rondom 12 (not available yet)
☐ Rondom 15 (not available yet)

Experiments and number of sets you request
From the gap-overlap we request all the datasets performed with the Tobii Pro Spectrum (5m 18, 10m 38 and 3y 20 datasets). From the gap-overlap we request 500 datasets from the 5m, 500 from the 10m and 500 from the 3y. In case there are not yet 500 measurements from the R3, we request all data sets from the R3 gap-overlap experiment.

Other aspects relevant to your data request (optional)

Data request for the purpose of:

☒   Analyses in order to publish:

         ☒   Article

         ☐   Report

         ☐   Thesis

         ☐   Other. Please specify

☐   Analyses for data quality control only (data will not be published)

☐   Analyses for descriptive data only, e.g. in order to determine good datasets (data will not be published

DISCLAIMER DATA ACCESS QUALITY CONTROL AND DESCRIPTIVE DATA: These data can only be used for data quality control analyses or descriptive data analyses only and may not be made public, for example by publishing them or otherwise making them available to others. If you want to use data for disclosure, permission of the YOUth data committee is required, and this data request protocol must be followed for analyses in order to publish.

Would you like to be notified when a new data lock is available?

In principle, data will be made available in data locks twice a year. This means that twice a year, the data is locked on a specific date and that all approved data request projects will receive the same locked data set.

☐   Yes

☒   No

Do you agree with publishing the complete request on our researcher's website after it is approved (by default)?

☒   Yes

☐   No. Please provide a rationale below.

NOTE 1: Please fill out the 'Form contributions to YOUth data collection' in Annex 1 to specify your contribution to YOUth in order to gain access to the requested data.

NOTE 2: Please fill out the 'Data Selection Template' (.xlsm) to specify the sort of data you request.

This Annex 1 together with the Data Selection Template and this Request Form should be sent to the Secretary of the Scientific Director (I.Bleeker@uu.nl).