Brainview

BABY lab uw
Pracownia Psychologii Niemowląt

Neurocognitive Development Lab

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Equipment and research methods of neurocognitive development

- **Neuroimaging techniques:**
  - Monitoring electrical activity on the brain (electroencephalography, **EEG**).
  - Monitoring changes in blood flow in the brain (near-infrared spectroscopy, **NIRS**).

- **Eye-tracking:** monitoring of visual behaviors, eye movements, measuring the time of looking at stimuli and changes in the extent of pupil dilation..

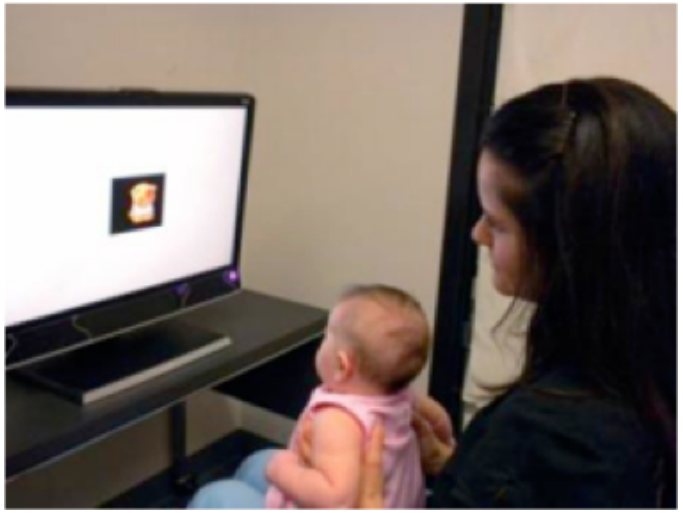
- **Movement Analysis:** wearable technologies, kinect, automatic video analysis.

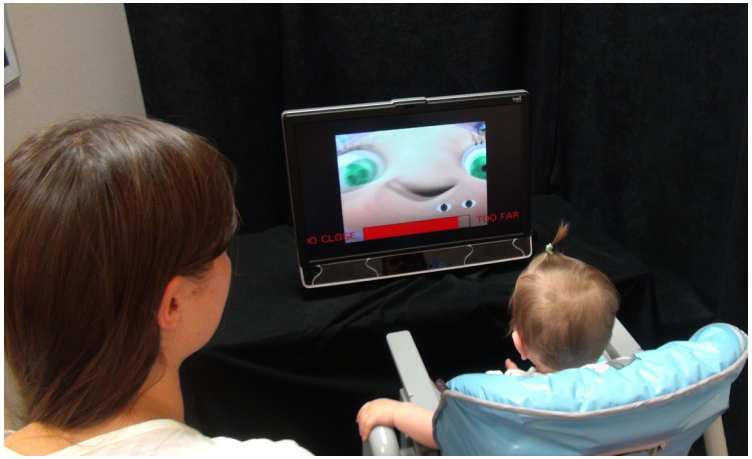
- **Observational measures, questionnaires, different scales.**

Electroencephalography

Near-Infrared Spectroscopy

Eye-Tracking





Movement Analysis Methods

- Wearable technologies
- Kinect
- Automatic video analysis

Observational measures

For Infant:

- Profil sensoryczny niemowlęcia i małego dziecka
- Skala chaosu
- Zrewidowany kwestionariusz zachowań niemowlęcych/wczesnodziecięcych
- Inwentarz rozwoju mowy i komunikacji
- Kwestionariusz snu i zasypiania
- Kwestionariusz demograficzny

For Parents:

- STAI
- FCZ_KT
- PSS_10
- AQ
- BAPQ

Other scales:

- Obrazkowy Test Słownikowy
- Skala Rozwojowa Mullen

Previous Projects

- **UWAGA NA CHMURY:** the project aims to obtain new information on how the attention of infants changes depending on whether they are in high or low alertness.

Previous Projects

- **TWARZE:** The aim of the project was to determine the relationship between the facial expressions of an adult and the tendency of an infant to follow that person's eyes.

frontiers in PSYCHOLOGY

ORIGINAL RESEARCH ARTICLE
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Gaze-cueing effect depends on facial expression of emotion in 9- to 12-month-old infants

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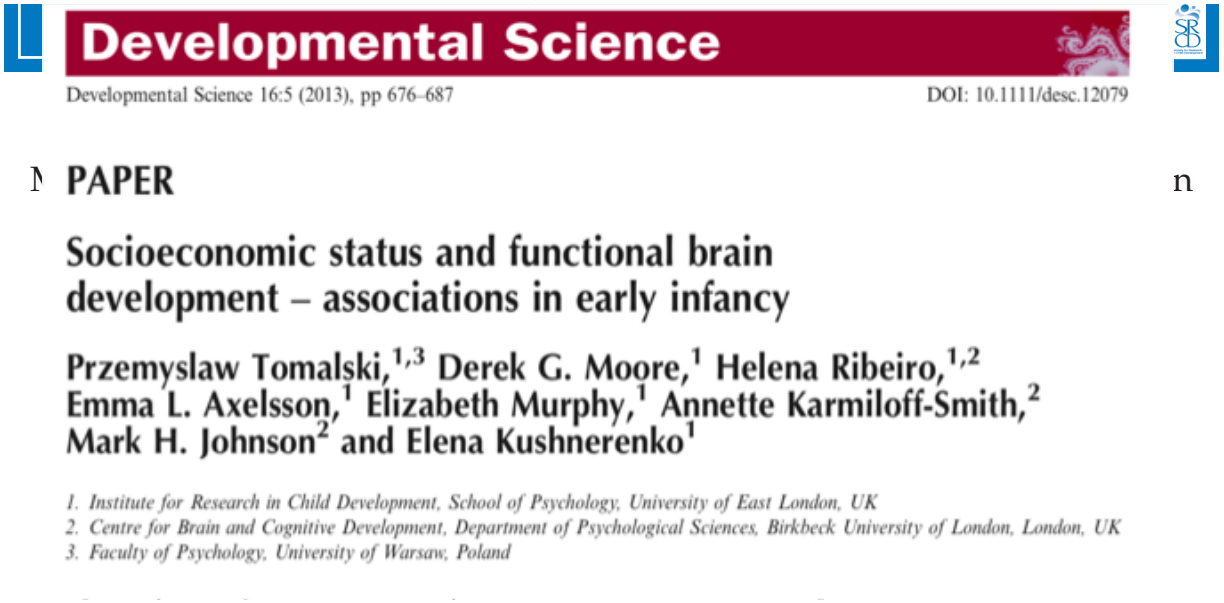
Efficient processing of gaze direction and facial expression of emotion is crucial for early social and emotional development. Toward the end of the first year of life infants begin to pay more attention to negative expressions, but it remains unclear to what extent emotion expression is processed jointly with gaze direction at this age. This study sought to establish the interactions of gaze direction and emotion expression in visual orienting in 9- to 12-month-olds. In particular, we tested whether these interactions can be explained by the negativity bias hypothesis and the shared signal hypothesis. We measured saccadic latencies in response to peripheral targets in a gaze-cueing paradigm with happy, angry, and fearful female faces. In the Pilot Experiment three gaze directions were used (direct, congruent with target location, incongruent with target location). In the Main Experiment we sought to replicate the results of the Pilot experiment using a simpler design without the direct gaze condition. In both experiments we found a robust gaze-cueing effect for happy faces, i.e., facilitation of orienting toward the target in the gaze-cued location, compared with the gaze-incongruent location. We found more rapid orienting to targets cued by happy relative to angry and fearful faces. We did not find any gaze-cueing effect for angry or fearful faces. These results are not consistent with the shared signal hypothesis. While our results show differential processing of positive and negative emotions, they do not support a general negativity bias. On the contrary, they indicate that toward the age of 12 months infants show a positivity bias in gaze-cueing tasks.

Previous Projects

- **POZNAJĘ SIEBIE I ŚWIAT WOKÓŁ MNIE:** is to answer the question of how the ability to regulate their attention, emotions and behavior in different situations is associated with cognitive development and language in children in the first years of life



Developmental Science

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PAPER

Socioeconomic status and functional brain development – associations in early infancy

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Ongoing Projects

- **POLSIBS:** polish part of the international research project EUROSIBS, studies the development of infants whose older siblings have a diagnosis of autism spectrum disorder (ASD).
- Infants who have older siblings with autism have a 10-20% risk of developing autism spectrum disorder alone.
- Many infants with familial risk develop unusually in the first 2 years, but do not develop disorders, therefore:
  - What are the differences between infants and family risks that will develop ASDs from those who do not get a diagnosis?
  - Can we predict which scenario will take place by measuring different behaviors and brain activity in the first year of a child's life?

Ongoing Projects

- **BAGA:** it aims to obtain information on how infants distinguish speech sounds and voices.

Ongoing Projects

- **GADAJĄCE GŁOWY**: Aim of the study: map neural correlates for audiovisual speech processing in 5- and 10-month-olds and search for the developmental changes in cortex sensitivity/selectivity to AV and visual speech between 5- and 10-months of age
  - Procedure: infants presented with videos of female speakers, 3 conditions: audiovisual speech (syllables with congruent audio), visual speech (syllables in silence), non-speech movements; brain activity recorded with fNIRS

Ongoing Projects

- **BRAINVIEW**: aims to establish an inter-disciplinary scientific network devoted to investigating the disruptions of prenatal and postnatal brain development that underlie neurodevelopmental disorders with onset early in life.

There is more…..

What else?

- Analysis of pupillometry data using recurrence quantification analysis.

Tools:

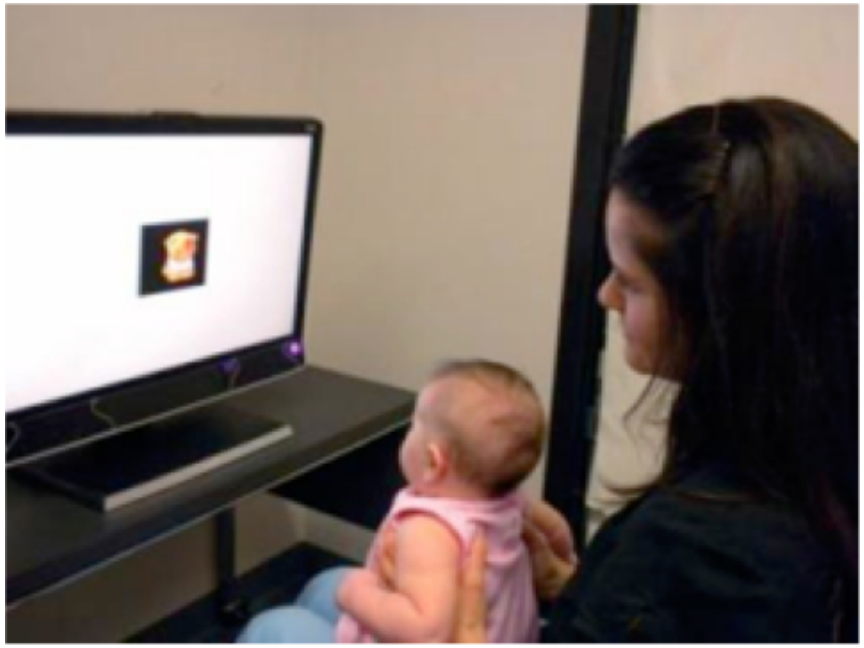
- Standard measurements.
- Recurrent Quantification Analysis.

Goal:

- Establish variability of the pupil during social-nonsocial and static-dynamic images.

What else?

- Analysis of eye movements during and its relation to attentional outcomes at 24 and 36 months.



Tools:

- Recurrence Quantification Analysis.
- ET traditional measures

Goal:

- Find predictors at 5 and 11 months of later attentional outcomes.
- Relation to anxiety.

What else?

- Automatic Movement Extraction in 5 and 11 months old Eye-Tracking videos.

Tools:

- Tracking-Learning-Detection.
- Coded data.

Goal:

- Link this movement with language outcomes at later age.

What else?

- Collaborative Exloration and Attachment in 11 and 24 months infants during interactions.

Tools:

- Tracking-Learning-Detection.
- Recurrence Quantification Analysis.

Goal:

- Find an automatic way of measuring collaborative exploration and attachment during PCIs and link it to developmental outcomes.

What else?

- BAGA with noise.
- Questionnaires data in comparison to behavioural data
- EEG data during different ET tasks.
- Polsibs ET, EEG, PCI.
- ….and many more.

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THANK YOU FOR YOUR ATTENTION!

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