REACH Conference
Abstract book

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Keynotes

K1 'What's in a face: How do facial expressions relate to social behaviour?'

Dr. Carlijn van den Boomen
Dr. Itir Önal Ertuğrul

The perception and expression of facial expressions are important building blocks for the social development of children. During the first year of life, children start showing and perceiving a variety of expressions. However, there are developmental differences between children in these abilities. This keynote showcases how the perception and expression of facial expressions relate to variance in children's social behaviour. Carlijn van den Boomen will discuss why children vary in their ability to differentiate between emotional facial expressions. She uses electroencephalography (EEG) to study differential responses in the brain activity of infants and toddlers. Carlijn will present the relation between emotional face perception and social input and -behaviour of children: (i) the relation with infant's social behaviour during parent-child interaction; and (ii) the relation with infant's social input during the Covid-19 pandemic. Next, Itir Onal Ertugrul will present her work on developing AI methods to automatically detect facial expressions in infants from video recordings. These methods allow for large-scale, fine-grained analyses of infant facial behavior. She will discuss how these automated approaches can be used to (i) examine parent–infant interactions across different contexts, (ii) predict early signs of withdrawn behavior and attention difficulties, and (iii) differentiate between forms of shyness during infant–stranger encounters.

K2 Sound and computation

Prof. Anja Volk
Dr. Frans Adriaans

In the second keynote, Prof. Anja Volk and dr. Frans Adriaans will bring together two lines of research that involve computational methods applied to early childhood research in music and speech. The first line, presented by Prof. Volk, focuses on music computation to support child development, employing music's affordance for rhythmic entrainment. The second line, presented by dr. Adriaans, focuses on computational models of early language development, in particular the learning from infant-directed speech and early bilingual language development. They will identify and discuss some challenges that lie ahead in advancing the application of computational methods to early childhood research.

K3 Play

Dr. Heidi Lesscher
Dr. Kirsten Visser

Fearful adults, restrictive regulations, and uninspiring playgrounds are limiting children's opportunities to engage in risky play. What does this mean for child development? And how can we create places that encourage climbing, speed, and adventure? In this keynote lecture, Kirsten Visser (urban geographer) and Heidi Lesscher (behavioural neuroscientist) will explore the essential role of risky play in the development of children. They will discuss current research on children's own experiences, the developmental value for brain and behaviour, and present opportunities and challenges for creating environments that stimulate risky play for all children.

Symposia

S1 The effects of COVID-19 on child development: interdisciplinary perspectives

In early childhood, children learn to develop their social-emotional and language skills as they interact with other people. However, due to measures to contain the COVID-19 pandemic, the daily circumstances of many young children changed dramatically in 2020-2022. Childcare centres were forced to close their doors for a long period of time, children were forced to stay at home, parental well-being decreased, and small-scale childcare such as grandparents were unavailable. This can negatively impact children's health, emotional well-being and cognitive development.
In this symposium, six interdisciplinary speakers will be brought together to explore how the COVID-19 pandemic has impacted children's language and socio-emotional development, anxiety and depression, face processing skills, childcare, and healthcare. We will discuss the influence of the pandemic on children from a variety of perspectives, giving a broad and comprehensive overview of the current research. Besides the findings of the studies, we will also address the challenges of conducting COVID-19 related research, which are often longitudinal or epidemiological studies dealing with missing data or biased samples.
Collectively, the findings highlight long-lasting consequences across cognitive, emotional, and health domains, as well as challenges in professional childcare. The studies reveal resilience against adverse effects in some areas but vulnerability in others. While basic developmental processes continued, the pandemic amplified risks across emotional, cognitive, and health domains.

Talk list

Dr Anika van der Klis (Developmental Psychology, Utrecht University)
The present study examined whether children (5 months - 4 years) assessed during or after the COVID-19 pandemic differ in language and socio-emotional development compared to children before the pandemic. For language, results show that two-year-olds and three-year-olds have smaller vocabularies after the pandemic. For socio-emotional development, problems increased in infants and male preschoolers. Results also show that screen time rose sharply during the pandemic and was negatively linked to vocabulary. Overall, the findings indicate that COVID-19 regulations had long-lasting impacts on children's language and socio-emotional development.

Dr Lisa Krijnen (Clinical Child and Family Studies, Utrecht University)
The present study showed that most children (1–6 years) experienced low levels of anxiety and depressive symptoms during 1.5 years of the COVID-19 pandemic in the Netherlands. However, one in five children experienced moderate-to-severe symptoms. Risk factors for anxiety and depressive symptoms during the COVID-19 crisis were mostly related to parental well-being. If a future crisis occurs, it is advised to screen and intervene on a family level to protect young children's mental health.

Dr Carlijn van den Boomen (Experimental Psychology, Utrecht University)
This study investigated how the reduction of the variety of facial input during Covid-19 policies affected neural representations of face processing. Event Related Potentials showed faster face processing in three-year-olds but not in infants during the policies. However, there were no meaningful differences between the before and during Covid-groups regarding face categorization, indicating that this fundamental process is resilient. In contrast, the processing of facial emotions was affected: across ages, while pre-pandemic children showed differential activity, during-pandemic children did not neurocognitively differentiate between happy and fearful expressions. Given that these findings were present only in the later neural components (P400 and Nc), this suggests that post-pandemic children have a reduced familiarity or attention towards happy facial expressions.

Prof Pauline Slot (Education and Pedagogy, Utrecht University)
Childcare played a vital role in caring for children during the coronavirus pandemic. Post-pandemic quality assessments revealed that quality was significantly compromised in several respects. For example, the quality of materials and activities decreased, and there was less contact with parents. The decrease in quality only appears to have recovered in 2024. Furthermore, professionals report an increase in the number of children requiring care or support. Providing adequate support to these children is demanding, and this is reflected in significant work stress among professionals.

Dr Hanneke Willemen (UMC Utrecht)
Post-COVID in children is a complex disease with an unknown pathophysiology, no diagnostic tools and therapies. Children are not just small adults and limited research to pediatric post-COVID hinders filling this void. Therefore, we aim to understand post-COVID in children to identify diagnostic marker and targets for therapies. We study fresh and biobanked samples from patients and healthy controls. Our preliminary results in blood, indicate signs of neuroinflammation and changes in the metabolome in post-COVID patients. A larger paediatric cohort study, focusing on patients aged 8-18, is currently being recruited, and will aid to validate these preliminary findings.

Prof Peter Lugtig (Methodology and Statistics, Utrecht University)
Peter Lugtig will act as discussant. He is a professor of data quality at the UU, and will reflect on the presentations from the perspective of the longitudinal research designs used, and problems that the studies encountered because of the Covid pandemic. This will lead into a discussion with the audience about the findings and implications of the studies presented.

S2 Mechanisms of exploration, play, and attention in early development: Interdisciplinary practices

Early development is shaped by children's ability to explore, play, and interact with their environment and caregivers. These behaviors not only support socio-emotional and cognitive growth but also provide a window into underlying developmental processes and vulnerabilities. In this symposium, four speakers will present complementary perspectives on the mechanisms of exploration, play, and attention, as well as their links to later outcomes.
The first presentation examines the neurobiology of social play, a natural reward essential for healthy social development, by disentangling its neural circuitry and motivational aspects. The second introduces a novel, automated system for assessing ADHD through video-based parent–child interactions, using machine learning to analyze visual, vocal, and verbal behaviors. The third uses narrative observations to investigate how childcare professionals support and facilitate exploration through their interactions and the "mise en place" of the learning environment. The fourth focuses on infants' exploration and embodied attention in home and childcare contexts, with particular emphasis on their role in language development and the influence of socioeconomic status. Together, these studies showcase innovative behavioral, observational, and computational methods. Collectively, they highlight how exploration, play, and attention provide a foundation for early learning and inform approaches to supporting and researching development across contexts.

Talk list

dr. Marijke Achterberg (Animals in Science & Society, Utrecht University)
My research interest is the neurobiology of social play behavior. Social play behavior is a natural reward and is essential for proper social development. Furthermore, social dysfunction is a key feature of psychiatric disorders such as autism, ADHD and schizophrenia. The aims of my research are to disentangle the neurocircuitry of social play behavior and highlight the importance of social play behaviour for social development. To these aims, I use pharmacological and chemogenetic tools in combination with behavioural set-ups. We study social play by coding total frequencies and durations up to microstructural level in dyads as well as in groups of 3 or 4 animals. We investigate individual differences in social play behaviour and how these differences affect adult social, impulsive and addictive behaviour. Next to that, we study the motivational aspects of play using an operant set-up to disentangle motivation from " consumption".

dr. Niilo Valtakari (Social and Affective Computing, Utrecht University)
Attention-Deficit/Hyperactivity Disorder (ADHD) affects about 8% of children and often continues into adulthood. While many symptoms of ADHD are observable, its assessment frequently relies on subjective reports, leading to potential inconsistencies and biases. We aim to develop the first automated system for assessing ADHD in children through video recordings of parent-child interactions. By integrating advanced machine learning techniques to analyze visual, vocal, and verbal behaviors, we will provide an interpretable evaluation. This approach will explore gender-related differences in key behaviors and enhancing the understanding and assessment of ADHD while laying groundwork for future applications in evaluating other neurodevelopmental disorders.

Mariska Venema, MEd (Development & Education of Youth in Diverse Societies, Utrecht University)
Exploration of objects and spaces is a key driver of infants' cognitive, motor, language, and social development. This presentation introduces a newly developed, theory-based observation instrument, created using narrative observations, to examine how childcare educators facilitate curiosity-driven play and scaffold language interactions with children aged 0–2 years. The instrument, informed by the CLASS Infant framework and extended with additional behavioral indicators, captures educators' attention cues, responsiveness, and adaptation to children's emerging abilities and interests. Findings highlight variation in facilitation styles and the alignment of language

support with children's moments of discovery, offering insights into enhancing exploratory play and early learning environments in childcare settings.

Isa Linders, MSc (Development & Education of Youth in Diverse Societies, Utrecht University)
This study investigates how infants' exploration and embodied attention (EA) relate to early language development. We compare these processes in home and childcare settings, examining how everyday contexts shape opportunities for engagement and exploration. Particular attention is given to socioeconomic status (SES), which may influence both the resources available to children and the ways caregivers scaffold exploration and language. To capture these dynamics, we are developing systematic observation schemes grounded in neo-Piagetian theory. These schemes are designed to reflect the complexity of exploration in children aged 11–21 months, offering a theory-driven framework for analyzing EA, exploration, and emerging language in various contexts.

S3 Distal and proximal effects on child development: Integrating views from Economics and Pedagogy

Bio-ecological frameworks stress that the development should be viewed in context. This means that both proximal factors, such as the family and (pre)school, and distal factors, such as national and local policy and culture, affect child development. The effects of distal factors are usually mediated by the effects of the proximal ones. In the symposium we study such effects from both economic and pedagogical perspectives. The first paper, presented by Ekin Yurdakul (Economics), examines the effects of two national policy changes in the Netherlands on the development of young children (aged 2.5-4 years). Using data from the EVENING study, he studies the effects of the increase of preschool hours, as well as the deployment of pedagogical coaches on the quality of preschool education and on children's broader developmental domains. Following, Vaso Tiliopoulou, (Pedagogical Sciences), uses the same data set, now using the longitudinal part, and focusses on the effects of specific preschool activities on the development of self-regulation from age 2.5 to 4 years. Self-regulation, is a central skill required for adaptive behavior throughout life. Finally, Ora Oudgenoeg-Paz (Pedagogical Sciences) will preset work on cross-cultural comparison of the strategies 2.5 years old toddlers and their parents employ during a self-control task. The combination of presentations shows how distal and proximal factors affect each other and ultimately child development. The studies use both economical approaches to establish causal effects of policy (i.e. Difference in Difference) as well as pedagogical approaches to establish effects on development (i.e., longitudinal analysis) and zoom in on the fine real-time dynamics of parent-child interactions across cultures.

Talk list

Improving Preschool Quality for Disadvantaged Children

Thomas van Huizen and Ekin Yurdakul

Ensuring equal access to high-quality early childhood education remains a key policy challenge. This paper examines how pedagogical leaders (coaches) affect preschool quality and child development in a preschool setting targeting children from disadvantaged families. Leveraging a nationwide reform in the Netherlands and using unique data on classroom observations and early childhood development, we find that pedagogical leaders improved the quality of interactions between teachers and children. Furthermore, the policy increased the frequency of small group educational activities with disadvantaged children. Consistent with the evidence on preschool quality, the results indicate that the policy reform improved the language development of disadvantaged children. There is no evidence of gains in other development domains. Exploring potential channels, we document that teachers who were more likely to be affected by the reform are more frequently coached, while ruling out alternative explanations such as changes in child and teacher composition, staff-child ratios, classroom composition, or other professional development activities.

Self-Regulation Development in Preschoolers: Differential Effects of Teacher-Led Versus Free Play Activities

Vaso Tiliopoulou, Ora Oudgenoeg-Paz, Pauline Slot and Paul Leseman

Self-regulation, defined as the ability to manage one's thoughts, emotions, and behaviors, develops rapidly during the preschool years and is a foundational skill that supports cognitive, emotional, and social competences and predicts long-term academic and psychosocial outcomes. While research has established the importance of early self-regulation and its sensitivity to environmental influences, less is known about how specific preschool activity types, particularly teacher-led versus free play (child-initiated) activities, contribute to its development during the early preschool years (ages 2–4). This study aims to fil this gap by using longitudinal data from the EVENING research project from children aged 2 to 4 years enrolled in early childhood education and care (ECEC) settings under the national equity policy supporting mainly disadvantaged children. Children's self-regulation is assessed through observational tasks, including attention and delay of gratification tasks, and teacher

ratings based on the Strengths and Difficulties Questionnaire (SDQ). We examine how structured activities (teacher-led) and unstructured free play activities (child-initiated), contribute to the development of self-regulation over time, and how individual differences in temperament and language ability moderate these relationships. Based on prior literature, it is hypothesized that self-regulation will improve significantly across the preschool years, with stronger associations for teacher-led activities due to their structured, goal-oriented nature. However, we also expect that the benefits of each activity type will not be uniform across all children. For example, children with stronger language skills or more adaptable temperaments may benefit more from free play, highlighting the importance of individualized approaches in early education. By integrating both environmental (activity structure) and child-level (temperament, language) factors, this study offers a better understanding of self-regulation development during a critical developmental period.

Initiation of Delay of Gratification in Toddlers: Automatized and/or Effortful Control?

Ora Oudgenoeg-Paz, Hanna Mulder, Maya Weinstein, & Ronny Geva

Self-control in early childhood is a crucial skill for the development of adaptive behaviour. However, little is known about the real-time dynamic through which child-parent dyads manage self-control in toddlerhood and how cultur might shape these processes. The current study examined self-control stategies of 26 Israeli and 18 Dutch toddlers and their parents in a waiting task. Using the “Tea Party” paradigm, toddlers were asked not to touch visibel sweets placed in front of them, while the experimenter left the room for few minutes. Parents remained present. Behavioural coding focused on the inital phase of the delay as this phase is important for stategy recruitment and predicting later outcomes.

While overal delay succes (i.e., not touching the snack) did not differ between countries, Israeli children showed lower initial failing risk, reflected by looking at the snack, having the hands near the snack or talking about it. Child-intitated self-regulation behaviours such as gaze aversion, or hand withholding appeared rapidly in both cultures, suggesting these might relatively automatic rather than effortful responses. Generally children, in both countries, also initated co-regulation, using behaviours such as looking at the parent and parents usually followed their lead. However, Israeli toddlers initiated co-regulation earlier than Dutch toddlers. Early regulatory behaviour, speciifcally gaze aversion was related to greater delay success, but this effect was driven by the three Dutch children who touched the snack straight away at the beginning of the task.

The findings highlight the role of early, possibly automated responses taking place early within the dealy. These responses are probably necessarly, but not sufficient for delay success. Other factors such as sustained attention might be important to obtain success after the initial part of the delay. The study also stresses the importance of the cultural contxt in shaping children’s tendency to recruit co-regulatory strategies.

Oral presentations

1.1. Before Words: How innate knowledge shapes preverbal infants' use of prosody to express communicative functions

Preverbal infants vary prosody – variations in pitch, duration, and intensity[1] – to express communicative functions[2]; however, the underlying mechanisms remain unclear. We asked how infants acquire prosodic form–meaning mappings, focusing on pitch. We hypothesised that infants first use pitch following innate biases (H1), and gradually rely less on these biases as they gain language-specific-knowledge (H2).

We examined the Frequency Code[3] (FC), outlining that smaller larynxes produce higher pitch than larger ones; consequently, speakers use higher pitch to sound 'small' (e.g., uncertain, as in questions/requests) and lower pitch to sound 'big' (e.g., confident, as in statements/comments). We compared Dutch- and Stockholm Swedish-exposed infants because Dutch typically uses rising questions and falling statements[4], following FC3, whereas Swedish uses falling contours for both[5]. Monolingual infants (13 Dutch-exposed, 12 Swedish-exposed) participated in 15-minute home-play sessions twice per month from 3-7 months (Figure 1A). Sessions included play conditions designed to elicit requests and comments. Audio was segmented in Praat[6] (Figure 1B) Using videos in ELAN7 (Figure 1C), speech-like vocalisations were coded as requests or comments (analysis-1), and requests were classified as initial or follow-up (analysis-2). Mean pitch per vocalisation was extracted using ProsodyPro[8], and the effects of communicative function, language, and age were analysed using linear-mixed-effects models[9].

Analysis-1 (n=2689 comments, n=1454 requests) revealed an effect of function ($p<0.001$) and function×age interaction ($p<0.001$) with requests having higher pitch than comments across ages, but with larger differences at 7 than 3 months. Analysis-2 (n=98 initial, 980 follow-up) revealed function×age interaction ($p<0.01$) with 3-month-olds marking follow-up requests with higher pitch than initial requests, but 7-month-olds marking both request types with similarly high pitch. No language-related effects emerged in analyses.

Infants systematically used pitch cross-linguistically, with patterns evolving between 3–7 months yet remaining consistent with the FC3. Results support H1 but not H2, suggesting biologically-motivated biases underpin prosodic form–meaning mappings throughout the preverbal phase.

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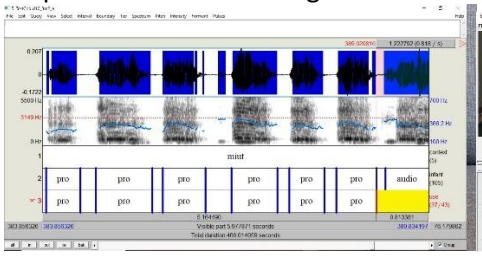
Figures

Image A: Observational set-up in home setting with participant-led positioning

Image B: Vocalisation segmentation in Praat using audio recordings

Image C: Functional interpretation in ELAN using muted video recordings

A



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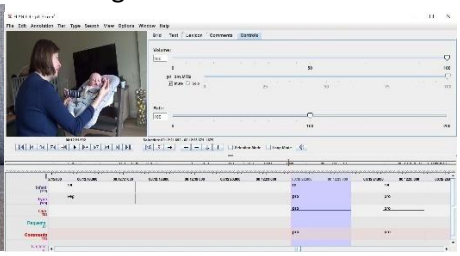

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1.2. The Implications of Measurement Models on Policy Evaluation

This paper investigates how measurement model choices affect causal inference in early childhood education (ECE) program evaluations, drawing on evidence from Bulgaria's Springboard for School Readiness randomized controlled trial. While extensive research shows that high-quality ECE programs can improve child development and narrow socioeconomic gaps, less attention has been given to how different psychometric frameworks may influence those conclusions. Using both Classical Test Theory (CTT) and Item Response Theory (IRT) to score literacy and numeracy assessments, this study quantifies how estimated program impacts, and their variation across sociodemographic groups, depend on the underlying measurement model. Re-estimating treatment effects under each approach reveals that effect sizes, statistical precision, and heterogeneity patterns shift systematically with the scoring method. The differences are most pronounced among minority children and those with lower initial skill levels, for whom IRT reallocates information across test items. These findings show that what appears to be a technical measurement choice can meaningfully alter substantive conclusions about program effectiveness and equity. Recognizing measurement as a consequential, yet often invisible, component of causal inference underscores the need for transparency and robustness checks in outcome construction. By demonstrating how the choice of measurement model can shape evaluations of large-scale ECE interventions, particularly in lower-income and stratified settings, this study informs both methodological best practice and evidence-based policy design.

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1.3. The effect of gestational diabetes on early language development

Gestational diabetes mellitus (GDM) affects 5-13% of pregnancies worldwide (Zhu & Zhang, 2016). GDM leads to poorer fetal neural maturation and connectivity, which are associated with poorer cognitive development (Rodolaki et al., 2023) and recognition memory (deRegnier et al., 2000). Moreover, GDM impacts language development (Dionne et al., 2008; Sells et al., 1994). However, why GDM leads to language-related deficits is yet unknown.

As GDM only impacts children prenatally and the fetal neural language network is shaped by prenatal experiences, GDM-exposed children's postnatal language delays may be related to GDM's negative impact on fetal neural maturation. Neural immaturity affects the extent to and speed of sound processing. The ability to distinguish auditory stimuli presented in rapid succession, or rapid auditory processing (RAP) is impacted in infants with a family history of language impairments, explaining much variance in later language outcome (Benasich et al., 2006). We thus hypothesize that GDM affects newborns' RAP.

To test this hypothesis, adopting Benasich et al.'s (2006) EEG oddball paradigm and pure tone stimuli, we assessed RAP in 30 full-term newborns (10 GDM and 20 control; see table 1 for demographics) within 120 hours postnatally. The amplitude of the Mismatch Response (MMR) and the latency and peak amplitude of the Auditory-Evoked Potentials (AEP; N250), were assessed (Benasich et al., 2006).

There were no significant differences between the GDM-group and control group in N250 latency, peak amplitude and MMR amplitude. A clear positive MMR was seen in the right anterior region (see figure 1), similar to Benasich et al. (2006).

Blood glucose levels were well-regulated in the GDM group, which might serve as a protective factor against neural immaturity due to GDM. A larger GDM sample with more variation in blood glucose regulation is needed to validate these findings.

At time of the conference, some results about our experiment on differentiation between speech and nonspeech stimuli in these groups will also be available.

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Tables and figures

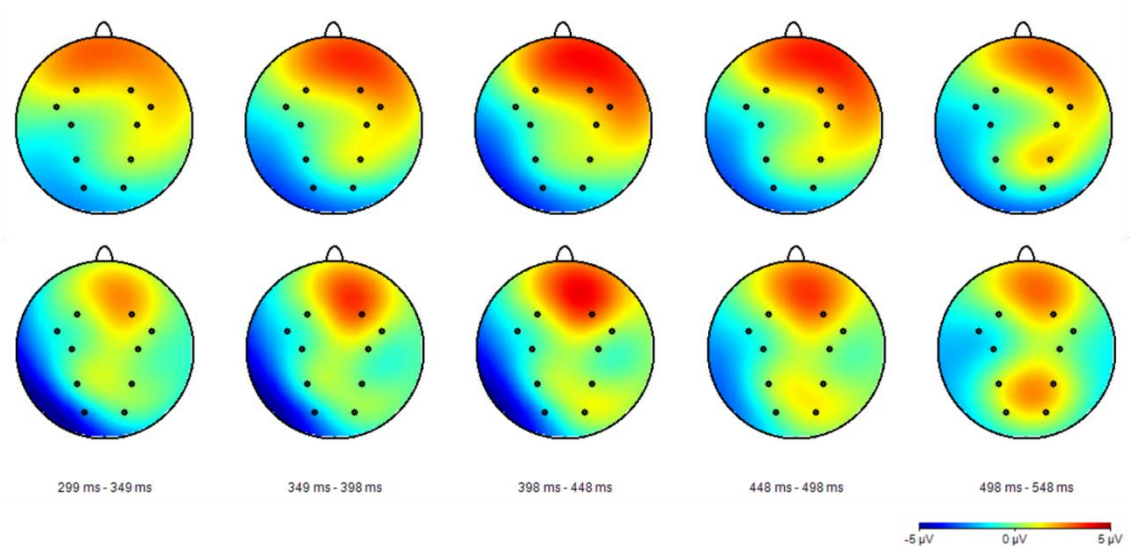
Table 1. Demographics.

The GDM and control group differed with regard to gestational age at birth, which is expected due to the relatively high birthweight of GDM infants, resulting in labor being frequently induced at a slightly lower gestational age. P-values are calculated using a Mann Whitney U test and Chi square test (latter only for sex at birth).

	GDM (n=10)	**Control (n=20)**	**P-value**
Gestational age at birth (weeks)	39.00 ± 1.02	39.94 ± 1.20	.044*
Postnatal age at EEG (days)	1.50 ± 1.43	1.05 ± 0.89	.506
Birthweight (grams)	3366.50 ± 380.49	3703.10 ± 424.89	.067
Head circumference (cm)	33.67 ± 1.52	34.57 ± 1.21	.114
Sex (%male)	20%	60%	.044*
Delivery mode *Emergency cesarean section* *Planned cesarean section* *Spontaneous vaginal birth*	 10% 90%	 15% 30% 50%	

Instrumental vaginal birth		5%	
Maternal age (years)	34.50 ± 4.72	32.85 ± 4.40	.366
Maternal pregnancy BMI	32.03 ± 5.07	25.86 ± 4.57	0.004**

Figure 1. Topography of mismatch response in control (top) and GDM (bottom) groups. The mismatch response is calculated as the difference between the pre-deviant standard and the deviant stimulus.



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1.4. Physical environmental factors and social-emotional development in infants

Background: Early social-emotional functioning is critical for child development and shaped by a multitude of environmental influences. Physical exposures such as air pollution, noise, and green space may impede or support child development. Pre- and postnatal exposure to air pollution and exposure to noise has been associated with a wide range of adverse neuropsychological outcomes, while greenspace has been linked to better cognition and a lower risk of mental disorders. As little is known about the impact of the physical environment on early social-emotional development, we investigate the extent to which air pollution, noise, and green space are associated with social-emotional competence in infants.
Methods: We used data from the population-based YOUth Baby & Child cohort, which follows children and their parents from the prenatal period onwards. Social-emotional development was assessed using the Ages and Stages Questionnaires: Social-emotional (ASQ: SE-2) at 5 and 10 months of age (N = 2112). Environmental exposure at the participants' home address at birth was derived from exposure maps developed within the EXPANSE and EXPOSOME programs. We investigated associations of ASQ: SE-2 scores with ambient air pollution (PM10, PM2.5, NO2, and ultrafine particles), neighborhood green space (NDVI, Euclidean distance to nearest green space), and traffic noise using multiple linear regression analyses. Models were adjusted for parental socioeconomic status (income, education) and maternal lifestyle (smoking, alcohol).
Results: Higher levels of residential green space and PM10 exposure are associated with higher levels of social-emotional development at 5 months of age (-1.10 ASQ-points per IQR-increase in distance to nearest green space, -0.95 ASQ-points per IQR increase of PM10). Results remain stable when adjusting for confounders. Data from the 10-month follow-up are currently being analysed.
Implication: The aim of this study is to contribute to a better understanding of the environmental factors that are relevant to early childhood development.

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1.5. Early Identification of Developmental Delays: Bridging Research and Practice

Monitoring early childhood development in a reliable and efficient way requires standardized tools that are age-appropriate, user-friendly, and norm-referenced. We developed an online monitoring system - Ontwikkeling Voorop! 0-6- designed to assess the development of children aged 0 to 6 years across five key domains: communication, gross motor, fine motor, cognitive, and social-emotional development. The system was evaluated in a large, representative sample of Dutch children. Psychometric analyses demonstrated sufficient reliability (e.g., internal consistency, inter-rater, and test-retest) and adequate convergent validity through comparison with established instruments including the Bayley-III, WPPSI-IV, and Schlichting Language Test. Cut-off scores at the 3rd, 10th, and 90th percentiles allow for early identification of children at risk for developmental delays.
In addition to establishing psychometric quality, the usability of Ontwikkeling Voorop! 0-6 was evaluated in a study focusing on vulnerable families (e.g. health/mental challenges, economic hardship, limited social support) that are allowed to make use of regular childcare through the Social-Medical Indication (SMI)-Childcare Scheme . Both parents and childcare professionals used the system to monitor child development in daily practice. Results showed that Ontwikkeling Voorop! 0-6 proved to be a valuable tool for early detection of developmental delays in this high-risk population. This presentation will provide an overview of the system's development, norming process, and psychometric properties, as well as insights from its application in real-world childcare settings. We will highlight how the system supports both professionals and parents in gaining a clearer understanding of a child's development and in making timely decisions about additional support when needed.

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1.6. Early Prosodic Boundary Perception: Innate Biases in Preterm Newborns

Segmenting continuous speech into meaningful linguistic units is an important first step for newborns acquiring language. The rhythmic and melodic structure of speech ('prosody') assists in this task by signalling boundaries between major speech units, e.g. Intonational Phrases (IPs). These boundaries are marked by three types of prosodic cues: pitch change, pre-boundary syllable lengthening, and pauses. Although infants can process prosodic structure early on, the underlying mechanisms remain unclear. We hypothesise that infants initially rely on innate perceptual biases to process IP boundaries, defined as physiologically-motivated or cross-species perceptual mechanisms, in the form of the Respiratory Code (RC) and the Iambic-Trochaic-Law (ITL). According to the RC, high pitch is associated with phrase beginnings and low pitch with phrase endings, with pauses between phrases. According to the ITL, lengthened and low-pitched elements occur phrase-finally. We predict that, despite their limited prenatal and postnatal linguistic exposure, preterm newborns are able to process IP boundaries using the individual cues, based on these biologically-motivated principles.
To test this, we presented 40 clinically-stable preterm newborns, born to Dutch-speaking parents at 28-33 weeks of gestation, with spoken phrases containing or lacking an IP boundary ([Moni and Lilli and Manu] vs. [Moni and Lilli] [and Manu]), within one week after birth. When a boundary was present, it was marked by either one cue or all cues. Using EEG, we measured the neurophysiological response to boundary processing, the Closure Positive Shift (CPS), in each condition versus the baseline (no cues).
Linear mixed effects modelling shows the CPS was elicited only in the pause condition in the right-frontotemporal region ($p < 0.001$). This implies newborns initially process major prosodic boundaries based on pauses, partially supporting our hypothesis. Associations between prosodic boundaries and other cues may be developed via input-driven learning.

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1.7. Early predictors of language outcomes in children born extremely preterm

Children born preterm are at risk of cognitive deficits including language problems. As language is crucial to social-emotional and academic development, early identification of language problems is imperative. In this study, we look at whether early cognitive, perinatal and/or sociodemographic factors can predict language outcomes of school-aged children born extremely preterm (EPT; <28 weeks of gestation). This may help guide clinicians in timely identification of children at risk of language problems.
The sentence repetition task from the CELF-4-NL, a standardized measure of complex language abilities, was administered at age 9 in 69 EPT children who participated in the BIOS study (UMCU). Early cognitive development was assessed with the BSID-III-NL Mental Development Index (BSID MDI) at 2.5 years (corrected age) and with the WPPSI-III-NL verbal IQ (VIQ) at 5.5 years of age. Additionally, information on perinatal factors (e.g., gestational age, bronchopulmonary dysplasia) and sociodemographic factors (e.g., parental education) was collected.
Both BSID MDI ($p < .001$, $R2 = .151$) and WPPSI VIQ ($p < .001$, $R2 = .358$) significantly predicted later language abilities, while in a multiple regression none of the perinatal or sociodemographic factors did ($p = .512$, $R2 = .091$). Despite the predictive relationship of VIQ, we observed that language outcomes were not on par with concurrent verbal IQ (WISC-V), see figure 1. Additionally, we descriptively compared the sociodemographic, early cognitive and a larger set of perinatal factors between children with below average language outcomes (<-1 SD; n = 19) and children with average or above average scores, see table 1.
Overall, our results suggest early cognitive outcomes rather than perinatal or sociodemographic factors may be most suitable to indicate a heightened risk for below average language skills in EPT children. Moreover, verbal IQ measures may not provide a good indication of language abilities. We will present a detailed discussion of outcomes and clinical implications.

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Figures and Tables

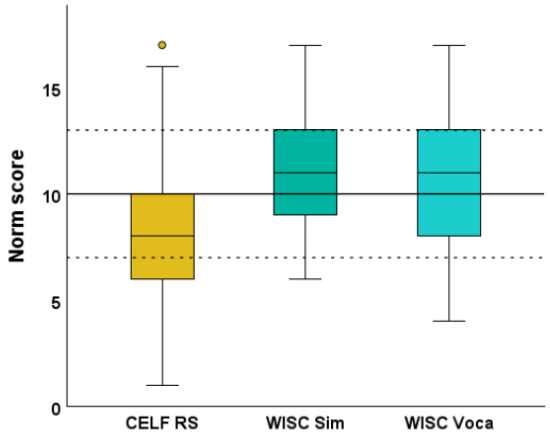

Figure 1. *Boxplots of norm scores of the CELF-4-NL Recalling Sentences (SR) subtest and both WISC-V-NL verbal comprehension subtests: Similarities (Sim) and Vocabulary (Voca).*
Dotted lines indicate + / - 1 SD around the normed mean (*M*=10, *SD*=3).

Table 1. Means (SDs) or counts (%) of sociodemographic, cognitive and perinatal factors for children with below average language outcomes (<-1 SD) and children with average or above average scores.

	CELF Recalling Sentences	
	Average or above	**Below average (<-1SD)**
N	50	19
CELF norm score	9.3 (2.4)	5.1 (1.2)
Sociodemographic factors		
N female (%)	32 (64%)	9 (47.4%)
N multilingual (%)	7 (14%)	3 (15.8%)
Parental education [1]	3.2 (0.76)	3.1 (0.84)
Cognitive factors		
BSID MDI	105.2 (12.0)	98.7 (10.4)
WPPSI VIQ	104.6 (13.5)	85.7 (9.4)
WISC VCI	109.1 (13.4)	93.9 (11.3)
WISC FSIQ	103.4 (12.0)	90.1 (10.8)
Perinatal		
Gestational age (weeks)	26.46 (1.02)	26.53 (0.96)
Birthweight (grams)	903.7 (140.4)	877.9 (237.2)
Apgar score at 5 min	7.3 (1.8)	7.4 (1.7)
N prenatal steroids[2] (%)	31 (62%)	12 (63.2%)
N IUGR (%)	2 (4%)	2 (10.5%)
N BPD[3] (n=61) (%)	10/44 (22.7%)	7/17 (41.2%)
N Sepsis[4] (%)	13 (26%)	7 (36.8%)
N ROP (grade 3-5) (%)	0 (0%)	3 (15.8%)
N NEC (Bell's stage >2a) (%)	1 (2%)	2 (10.5%)
N IVH (grade 3-4) (%)	3 (6%)	3 (15.8%)
N PHVD[5] (%)	1 (2%)	1 (5.3%)
N Hypotension[6] (%)	13 (26%)	5 (26.3%)
N PDA[7] (%)	6 (12%)	0 (0%)

BPD = Bronchopulmonary dysplasia; BSID MDI = Bayley Scales of Infant and Toddler Development III-NL, Mental Development Index; IUGR = Intrauterine growth restriction; IVH = Intraventricular hemorrhage; NEC = Necrotizing enterocolitis; PHVD = Posthemorrhagic ventricular dilatation; PDA = Patent ductus arteriosus; ROP = Retinopathy of prematurity; WISC VCI / FSIQ= Wechsler Intelligence Scale for Children V-NL, Verbal Comprehension Index / Full Scale Intelligence Quotient; WPPSI VIQ = Wechsler Preschool and Primary Scale of Intelligence III-NL, Verbal Intelligence Quotient.

1. Average of both parents on a scale of 0 to 4, n=68
2. Prenatal corticosteroid administration was taken as a completed course or more (multi day).
3. BPD was defined as needing oxygen (> 21% oxygen or > 1L flow) after 36 weeks.
4. One case of early onset sepsis, 19 cases of late onset sepsis.
5. Cases where a shunt was placed.
6. Cases treated with inotropes (dopamine or dobutamine) and/or corticosteroids (hydrocortisone)
7. Cases where PDA was surgically corrected.

1.8. Memory, attention and vocabulary in 22q11.2 deletion syndrome

Background: Many children with 22q11.2 deletion syndrome (22q11DS) have difficulties learning words, resulting in smaller vocabulary sizes relative to typically developing (TD) children. Vocabulary is essential for academic skills and success in life. It is, however, unknown what the reasons are children with 22q11DS experience difficulties learning words. In TD children, vocabulary size is known to be related to short-term and working memory and attention. As children with 22q11DS are reported to have (relatively) weak cognitive skills, we hypothesize that there is a similar relation for children with 22q11DS. The present research was the first to test this hypothesis in a longitudinal study. Methods: 44 children with 22q11DS and 81 TD children between the ages of 3 and 6,5 years participated in a first measurement wave approximately 6 years ago. We are currently in the process of testing them for follow-up measurements in a second wave. Age-appropriate standardized tests are used to measure short-term and working memory, selective attention and receptive and expressive vocabulary. Results: Data from the first measurement showed that children with 22q11DS have both weaker memory and attention skills and a smaller vocabulary than TD-children. We expect that the longitudinal data will show a predictive relationship between memory and attention at wave 1 and vocabulary at wave 2. Conclusion: The findings contribute to a better understanding of the relation between vocabulary acquisition and domain-general cognitive prerequisites in both typical and atypical development, and are likely to have implications for diagnostics and treatment of language difficulties (in 22q11DS).

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2.1. Neurodevelopmental disorders and multilingualism in child and adolescent psychiatry

Multilingualism is no exception in Dutch society, but a monolingual (Dutch) norm is still commonly used in healthcare. In child and adolescent psychiatry, for example, children's language skills are screened during intake, but this screening does not encompass all languages a child may have experience with. This can result in an incomplete (and incorrect) picture of a child's competencies, possibly hindering the adequate identification of a neurodevelopmental disorder (ND) in multilingual children.

The current study examined whether the likelihood of being diagnosed with an ND in child and adolescent psychiatry is different between multilingual and monolingual children. We retrospectively reviewed the patient records of 3670 children (<12 years old) referred to Karakter, a specialized center for child and adolescent psychiatry. We extracted information on multilingualism (yes/no), diagnosis of ND (yes/no), type of ND (Autism Spectrum Disorder (ASD), Attention Deficit Hyperactivity Disorder (ADHD), other), age at first assessment, migration background and socio-economic status.

Preliminary results showed that 71.5% of multilingual children were diagnosed with an ND, in comparison to 65% of monolingual children ($p = .004$). Multilinguals were assessed at a significantly younger age (5 years) than monolinguals (7 years) ($p < .001$). In multilinguals, the diagnosis of ASD was more common than in monolinguals (50.5% vs. 31.6%; $p < .001$), whereas the reverse pattern was seen for ADHD (10.1% vs. 21.6%; $p < .001$).

The preliminary results of our study suggest that the likelihood of being diagnosed with a neurodevelopmental disorder, specifically ASD, is larger for multilingual children. This may reflect a difficulty with dealing with the larger variation in Dutch language skills of these children, emphasizing the need for an elaborate anamnesis with parents, the use of non-verbal diagnostic instruments, and, if possible, testing in all languages of the child.

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2.2. Learning prosodic phrasing in infancy: The role of gestures and visual attention

Speakers use prosody (variation in pitch, duration, and intensity) to group words into meaningful units [1–4], and listeners rely on prosodic cues in speech comprehension. This process is known as prosodic phrasing. Interestingly, the use of prosodic cues varies across languages. Research on prosodic phrasing development has primarily focused on auditory cues. Gestures accompanying speech (co-speech gestures) have been found to co-occur with prosodic boundaries [5,6]. Visual cues could influence the learning of prosodic phrasing not only through their presence but also through infants' attention to them, as attention to mouth movements and pointing gestures supports lexical development [7,8]. This study therefore investigates (1) how the availability of co-speech gestures influences infants' learning of prosodic phrasing and (2) how infants' gaze behaviour during interactions relates to their learning of prosodic phrasing.

Dutch monolingual infants aged 4 and 8 months participated in twelve German-exposure sessions with a native German speaker over twelve weeks. Gesture availability was manipulated between participants: in the high-availability condition, the speaker could use hand gestures; in the low-availability condition, hand movements were restricted. Learning outcomes were assessed after the exposure sessions using EEG, with the Closure Positive Shift (CPS) as a prosodic boundary perception index. In addition, infants' gaze behaviour was recorded with eye-tracking during 4 sessions to estimate gaze to the speaker's hands and face.

We hypothesised that infants exposed to German in the high-availability condition would show stronger prosodic phrasing learning, reflected in larger CPS responses, than those in the low-availability condition. We also examined whether infants' gaze to gestures related to learning outcomes, expecting relatively little gaze directed towards co-speech gestures based on adult findings [9,10].

To date, 32 participants have been enrolled, 18 of whom completed all eye-tracking and EEG sessions. Data analysis is underway, and results are expected before the conference.

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2.3. Resilience and Protective Factors for Maternal Mental Health in Eventful Pregnancies: Insights from Preeclampsia Survivors in Ghana

Background: Maternal mental health plays a crucial role in shaping not only the wellbeing of mothers but also the developmental trajectories of their children. In low- and middle-income countries (LMICs), pregnancy complications such as preeclampsia introduce heightened psychological risks that may affect early parent–child interactions and long-term youth outcomes. Despite growing awareness of perinatal mental health, research has disproportionately emphasized risk over resilience. This study explores the protective and resilience-promoting factors that sustain maternal mental health in women who experience eventful pregnancies, drawing on community-driven narratives in Ghana.
Methods: A reflexive thematic analysis was conducted using qualitative materials—interviews, stories, and community engagement outputs—curated by Action on Preeclampsia Ghana (APEC-GH), a survivor-led NGO. Data were examined inductively to identify recurring themes related to resilience and support systems across individual, familial, healthcare, and societal levels.
Results: Five overarching resilience themes emerged: (1) supportive health policies and institutional partnerships; (2) family and partner support systems; (3) effective and empathetic healthcare delivery; (4) availability of psychosocial and counseling resources; and (5) empowerment through education and community awareness. These factors collectively buffer psychological distress, promote emotional recovery, and enhance the mother's ability to nurture and bond with her child—contributing to healthier developmental environments for infants and youth.
Conclusion: This study highlights resilience as a key developmental asset that links maternal wellbeing to youth outcomes. Strengthening protective ecosystems around mothers—through policy integration, family engagement, and psychosocial care—can mitigate the intergenerational transmission of adversity. The findings resonate strongly with the Dynamics of Youth mission to foster environments where young people can grow, thrive, and reach their full potential, starting with the wellbeing of their mothers.

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2.4. Everyone should be a hero, but only some accents get the part: Language media biases in 5-year-olds

Children's media in North America has tended to disproportionately depict villains with foreign/non-standard accents compared to standard accents (e.g., Dobrow & Gidney, 1998; Lippi-Green, 2012). Although it has been suggested that children are sensitive to these biased linguistic patterns, no research has examined whether these patterns are reflected in children's own media biases. In the current study, we investigated the extent to which 5- and 6-year-old Canadian English-speaking children associate foreign accents with villainous characters. In Experiment 1, children (N = 80) were asked to watch cartoons of foreign- and native-accented voice actors each portraying both a hero and a villain, and decide which character each actor was better suited for. Results showed a general hero bias, with children significantly more likely than chance to cast voice actors for hero roles ($p < .001$), regardless of actor accent ($p = .13$) (see Figure A). To explore whether children lack accent-based media biases, or whether such biases were masked by their preference to choose heroes, in Experiment 2, children were presented with two performances of the same character (hero or villain) differing only by accent (e.g., a foreign vs. local), and were asked to choose which voice actor they thought was more suited to voice the character. In this context, we found stronger evidence of accent bias, with children significantly more likely to find foreign-accented voice actors more suitable for villain characters compared to hero characters ($p < .01$; Figure B). Altogether, this work takes a first step towards understanding how the portrayal of accents in media might be reflected in children's developing language attitudes.

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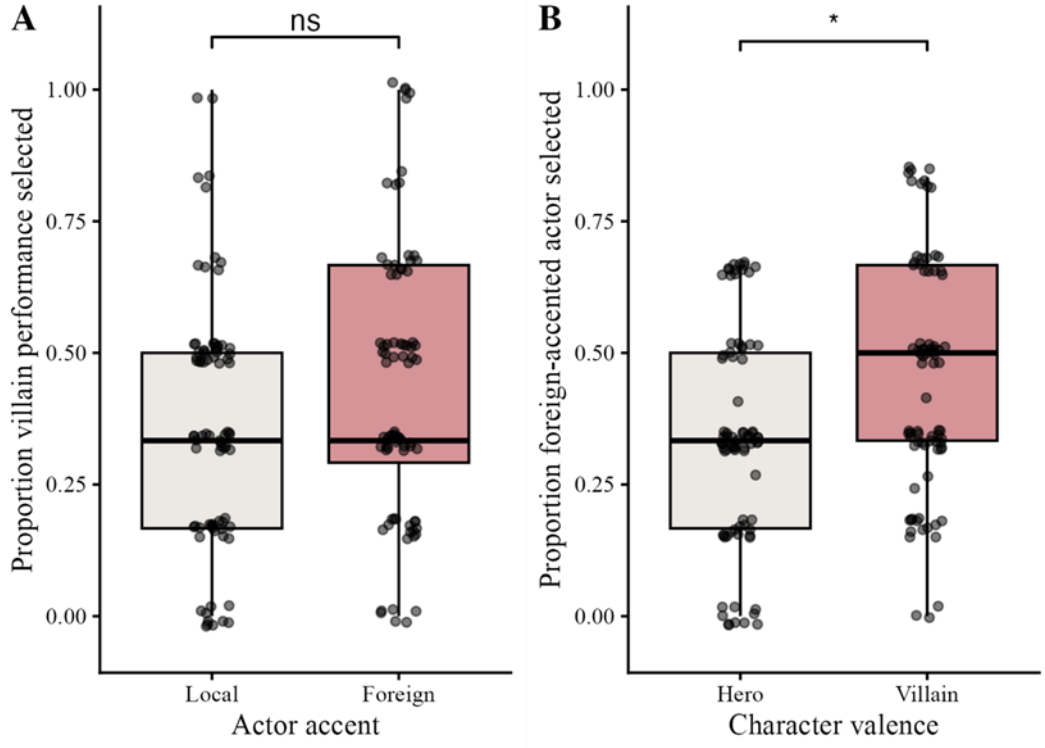

2.5. Self Assessment by SASTA

SASTA [van Boheemen et al., 2024] is a web application that automates the application of established methods for analyzing transcripts of spontaneous language such as TARSP (for children below 4 years of age) [Schlichting, 2017] and STAP (for children aged 4-8 years) [van Ierland et al., 2008; Verbeek et al., 2007].
SASTA achieves good results (F1-score for samples between 74% and 96%, average F1-score for datasets 90.4%), but is certainly not perfect. Therefore, a manual check of the results by human experts is often necessary.
If the human expert has to check the whole transcript, the gain in efficiency by using SASTA is limited. This gain can be increased if SASTA could point out specific utterances that it considers or suspects to be problematic, i.e. if SASTA could do some form of self-assessment. Here, we report on research investigating the feasibility of such a SASTA self-assessment procedure.
SASTA Self Assessment aims to provide a list of utterances that have to be manually corrected. We assume that manual correction of an utterance leads to a 100% F1-score for that utterance. We initially set the target F1-score for the whole transcript at 95% and the maximum number of utterances that have to be manually corrected at 15. In the worst case, this means that about a third of the utterances of a sample need to be corrected.
We identified some 30 criteria that could reliably indicate potential misanalysis by the parser used in SASTA (Alpino, [Van Noord, 2006]). We also identified some criteria to assess the correctness of certain queries used in SASTA.
In the presentation, we will introduce these criteria. We will report on the results we obtained and reflect on the approach taken.

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2.6. Comparing EEG-preprocessing pipelines in infants: a test-retest analysis of neural tracking

Infants' EEG has been widely used to capture development, for instance in the YOUth cohort. Indices of EEG can signal meaningful individual differences: for example, infants' speech-brain coherence has been linked to future vocabulary (Menn et al., 2022). Prior to analyzing data, one needs to preprocess the raw EEG, which involves many different steps. Lately, several preprocessing pipelines have been suggested in the literature. In this study, we systematically varied different preprocessing steps in an EEG preprocessing pipeline for speech–brain coherence (SBC) analyses and assessed test–retest reliability across stressed syllabic (1–3 Hz), syllabic (3–5 Hz), and phonemic (5–15 Hz) frequency bands. Seventy-six 10-month-old infants watched 1-minute clips of two women singing Dutch nursery rhymes in two sessions, one week apart, while a 32-channel EEG was recorded (see also van der Velde et al., 2019; same design as in Menn et al. (2022)). The variations in preprocessing steps included different artifact-removal strategies (ICA + iMARA), bad-channel interpolation, and epoch thresholds (min 30-90). Under the optimized settings (Bandpass filters 0.1-40 Hz + additional 50 Hz notch filter, ICA using runica + iMARA, spherical splines interpolation, common average re-referencing, and minimum 70 clean epochs), all frequency bands improved compared to our baseline pipeline (Van der Velde et al 2019; ΔICC ≈ .25), while keeping the removal rate low (~32%). We also compared our preprocessing pipeline against other pipelines (Happy, Happilee, Made). Varying the preprocessing steps caused ICC results to range from non-significant to significant, while removal rates also fluctuated between 22% and 41%. These results demonstrate that preprocessing choices can affect the reliability of SBC measures in infancy. Crucially, this pipeline provides the benchmark for our future analyses with neural tracking for the YOUth cohort.

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2.7. Assessing language development in the YOUth baby & child cohort: an add-on wave

The YOUth Baby & Child cohort is a longitudinal study that follows children from pregnancy to mid-childhood, focusing on how brain development connects to social competence and behavioral control (Onland-Moret et al, 2020). This data set is freely available for researchers. Here, we present the add-on wave 'Bravechild', which concentrated on language development. We describe design and report the language profiles for 341 children from YOUth, whose data was collected when they were 3-6-years old. All data collected in Bravechild will be made openly available in the YOUth repository. Our data-collection comprised four parts. We assessed children's full language profiles, using the Pre-CELF battery (Wiig et al., 2012), which provides not only norm-scores for general language ability, but also more fine-grained norm-scores for language production; comprehension; language content; language structure; and phonological awareness. Children also participated in a Dutch adaptation of a theory-of-mind task (Wellmann & Liu, 2004; Wyman et al, 2025). Parents filled in one questionnaire on their child's communicative abilities (i.e., CCC-2-NL; Geurts, 2007) and one on language use in their household. As a last step, we collected vocabulary norms (PPVT) for one or both biological parents present. Next, we describe performance for each language outcome (mean, median, range) and analyze performance by child's sex (N female = 188) and by monolingual versus multilingual environments (Rocha et al., 2024). We also report relations among concurrent measures. Preliminary results among the language norm-scores show that each norm-score is significantly related to others, but differs in strength. Finally, we test stability by inspecting longitudinal links with vocabulary norms collected earlier in the YOUth cohort (Van der Klis et al., 2024). Thus, we offer a rich description of language profiles in YOUth, providing the benchmark for our future longitudinal brain-language outcome analyses, and which may interest other researchers.

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Poster presentations

1.1. Validating the Theory of Mind Scale in typically developing Dutch-speaking children and its relation to individual differences in language profiles

A fully developed Theory of Mind (ToM) is essential for children's overall cognitive and social development. ToM refers to a child's ability to understand that other people have mental states that may differ from their own. A ToM-Scale was developed to capture the progression of ToM (Wellman & Liu, 2004). This scale has been used to measure this progression in a variety of groups, showing that this sequence does not appear to be universal (Wellman et al., 2006, 2011). We aim to test the validity of this scale by examining how Dutch children (N = 348; age = 3-7 years) progress comparable to their English-speaking peers.

Evidence suggest that children's individual variation of ToM-performance has been linked to their language abilities (Milligan et al., 2007). However, there are mixed results concerning this relationship. Ebert (2020) found that receptive language abilities predicted ToM-scores, Brock et al. (2018) found expressive language as the predictor. Individual differences also prove meaningful when we examine communicative abilities namely, pragmatics. For older children, pragmatic ability has been correlated with ToM (Babarczy et al., 2024). However, the role of younger children's pragmatic ability in predicting ToM-performance has not been examined before. The second aim is to investigate which language and communicative abilities are related to ToM development.

We administered a Dutch adaptation of the ToM-Scale to typically developing Dutch children. Age-normed language profiles (N = 334) were collected using the pre-CELF (Wiig et al., 2012) and the parental questionnaire CCC (Bishop, 2013). The pre-CELF offers 4 language indexes (receptive, expressive, semantics and syntax), the CCC adds a general communicative and pragmatic score. We will examine which language and communicative abilities relate to ToM-scores by performing regression analyses. Results will provide insights into the development of ToM of Dutch-speaking children and how this links to their language profiles.

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1.2. The Role of Associative Learning in the Acquisition of Prosody-Emotion Mappings during the Prenatal Period

Prosody, the pitch, intensity, and duration of speech, plays a central role in spoken language and is crucial for expressing and perceiving emotion. From a very early age, newborns use prosody to interpret and express a wide range of communicative meanings during social interactions. Previous research has shown that newborns can distinguish between angry and fearful vocal stimuli. Additionally, prior work using functional near-infrared spectroscopy (fNIRS) has shown that 4-day-old newborns exhibit differential neural responses to happy, angry, and neutral prosody. However, little is known about how newborns learn to map prosodic patterns onto emotions, and how these mappings are represented in the neonatal brain. The present study seeks to address this gap by investigating how newborns acquire prosodic form–meaning mappings for emotion. Specifically, it examines whether fetuses in the third trimester can use associative learning to link prosodic contours (e.g., rising vs. falling pitch) with emotional meanings (e.g., happiness vs. sadness). To test this, pregnant mothers will be systematically exposed to emotional clips with sound (via headphones), while their fetuses will be exposed to different prosodic contours presented through nonword utterances. Within two weeks after birth, newborns' neural responses will be measured with electroencephalography (EEG), focusing on P200-like and late positive potential (LPP)-like components to determine whether such associations are learned in utero. The P200 component reflects early stages of emotional processing; the LPP component will capture more elaborate processing of emotional arousal and emotional relevance in adults. This research aims to shed light on the earliest origins of prosodic-emotional learning, offering new insights into how the human brain begins to organize language and emotion before birth. Data collection is ongoing. First results are expected in early 2026.

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1.3. Functional Flexibility in Vocalisation of Children and Adolescents with Non- or Minimally Verbal Autism

Approximately 30% of individuals with autism may be non- or minimally verbal (NMVA; Norrelgen et al., 2015; Tager-Flusberg & Kasari, 2013). Yet, despite this prevalence, little is known about their communicative abilities. NMVA vocalisations are suggested to resemble those of pre-linguistic infants (e.g., Sheets, 2022). In infant research, vocalisations are often categorised as fixed signals, which have relatively inflexible valence (e.g., cries are negative, laughs are positive), or protophones, which exhibit functional flexibility: the ability to occur across different affective states and communicative contexts (Taylor et al., 2022; Oller et al., 2013). Protophones, because of this flexibility as well as their phonological properties, are often regarded as the precursors to speech and the later development of language, as they provide a foundation for more elaborate communicative patterns (Taylor et al., 2022; Oller et al., 1999; Oller & Griebel, 2021).

To our knowledge, no studies have examined whether different vocalisation types produced by NMVA individuals also demonstrate functional flexibility. To address this, we analyse a pre-existing dataset (Slušná et al., 2021) containing 23 NMVA individuals (5 females, age M = 11;4, SD = 4;0) recorded during the Autism Diagnostic Observation Schedule (ADOS: Lord et al., 2012) or the adapted ADOS (Hus et al., 2011). Our method is adapted from Jhang & Oller (2017), who assessed functional flexibility in infant vocalisations. In the current study, valence (positive, neutral, and negative) of vocalisations is determined using accompanying facial expressions and vocalisations are categorised as cry, laugh, word (word and word approximations), syllable (vowel-consonant combinations), vocant (vowel-like sounds), squeal, growl, groan, and other (e.g., singing, vegetative vocalisations, echolalia). Following Jhang & Oller (2017), vocalisations are considered functionally flexible if they were predominantly neutral in valence as well as less negative than cries and less positive than laughs.

Using this approach, we examine whether NMVA vocalisations demonstrate functional flexibility and whether this varies across vocalisation types, providing insight into the population's communicative abilities and the relationship between functional flexibility and language development.

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1.4. Eyes on the Input: Combining Pupillometry and the Head-turn Preference Paradigm in Infant Rule Learning

Understanding the cognitive processes underlying language acquisition is a central goal in psycholinguistics. Language learning entails, among others, inferring rules from limited input. A widely used paradigm to study infant rule learning is the Head-Turn Preference Paradigm (HTPP), in which infants sit on a caregiver's lap and listen to auditory stimuli containing a grammatical rule. In a subsequent test phase, sounds play from side-mounted speakers, and infants' head-turns toward the sound source are recorded. Longer looking times to stimuli following the rule indicate familiarity or preference, reflecting learning.

HTPP has been instrumental in investigating infant language learning, but it only captures post-learning behavior. The cognitive processes during learning -whether infants attend to the stimuli, which stimuli, when, and to what extent-, remain unknown, while adult research has shown that attention during exposure affects learning outcomes.

We address this limitation by integrating a physiological measure into HTPP. Pupillometry measures pupil size changes as an index of cognitive processes, like attention and mental effort, and has proven valuable in studying language perception, processing, and production. Our study has two aims: (a) to assess the feasibility of combining pupillometry with HTPP, and (b) to test whether attention during exposure predicts subsequent learning outcomes.

Thirty-six 15-month-old infants will complete an artificial language-learning task. During the exposure phase, pupil responses will be recorded; during testing, rule learning will be assessed via HTPP by comparing looking times to grammatical versus ungrammatical sentences. A pilot study with four infants has supported the feasibility and potential of this combined approach. A relationship between pupil responses during training and learning outcomes would provide evidence that attention and mental effort affect infants' rule learning. More broadly, if successful, this study will represent a methodological advancement in infants' language research by enhancing a well-established paradigm with real-time cognitive measures.

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1.5. After-school physical activity programs for children aged 4–12: a multidisciplinary analysis of benefits for children and communities

Children are recommended by the WHO to spend at least 60 minutes a day on moderate- to vigorous-intensity physical activity and at least three times per week on vigorous-intensity exercises that strengthen muscles and bones. Moreover, sedentary behavior should be minimized. There are increasing concerns about children's health and how physically they are, especially with the increase of screen time. In response to these concerns and the WHO recommendations, several countries have implemented after-school physical activity programs aimed at increasing children's daily movement and evaluating their potential benefits. The current study aims to synthesize the available evidence from a multi-disciplinary perspective.

In this narrative review we conducted a comprehensive analysis of scientific articles focused on after-school programs related to physical activity among children aged 4 to12 years. The selected papers covered diverse research disciplines, including medical, behavioral, psychological, pedagogical, sport science, public health, and nutritional perspectives. Articles were identified through a keyword-based search, which were systematically analyzed. The search resulted in 40 studies, including 5 reviews or meta-analyses and 35 original empirical studies.

Preliminary analyses support the benefits of physical activities for children's development. The findings are categorized into three main domains of child development: (1) physical and motor benefits, (2) social and emotional benefits, and (3) cognitive and academic benefits. In addition, a fourth main domain emerged, focusing on the (4) community-level impact that such programs can generate. Motivation was identified as a key supporting factor across all contexts, reinforcing the importance of well-structured and enjoyable after-school programs.

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1.6. Creativity in dialogues: How do children interact with parents vs. strangers for generating creative ideas?

Background. It was increasingly pointed out that creativity does not occur in isolation within individual minds but rather through continuous interactions between people.

Aims. This study investigated whether and how interactions revealing perspective taking within dyads influenced the generation of creative ideas.

Sample. Participants were 103 4- to 6-year-old Chinese children, 60 parents, and 43 university students.

Method. Children were semi-randomly assigned to either work with a (grand)parent (child-parent dyads) or with an unfamiliar university student (child-stranger dyads) on the Alternative Uses Task (AUT), wherein they needed to "think together" of as many unusual uses as possible for five everyday objects. A novel coding scheme was designed and applied to analyze subjects' verbalization, differentiating cognitive perspective taking (an exchange ideas and thoughts) and social-emotional perspective taking (creating an open, accepting atmosphere).

Results. Child-parent dyads exhibited more cognitive perspective taking than child-stranger dyads, but no group differences were found regarding their social-emotional perspective taking. Regardless of dyad type, dyads' cognitive perspective taking facilitated dyads' fluency and originality but hindered their appropriateness. Pertaining to individual subjects within the dyads, the influences of people's cognitive perspective taking on their own and their counterpart's creative performance are shaped by the subjects' characteristics (adults vs. children) and the social contexts (familiar vs. unfamiliar).

Conclusions. Cognitive perspective taking is crucial for the emergence of creativity, whereas the role of social-emotional perspective taking remains unclear.

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1.7. The complexity of parent-professional collaboration

Collaborative practice between health care professionals (HCPs) and parents is a key-element of family-centred care. However, collaborative practice is challenging for HCPs and parents. As a result, therapy is often carried out in a therapist-led and child-centred way. Actual change and implementation of parent-professional collaboration in clinical practice will only be successful when its complexity is unravelled and key-elements are made explicit.

This study aimed to develop a deeper understanding of the complexity of collaborative practice in therapy for children with developmental disorders. A systematic literature review was conducted, followed by qualitative research including interviews with parents, individual and group interviews with HCPs. The data were analysed through the lens of behaviour change, allowing us to identify underlying mechanisms and conditions that support or hinder collaborative practices.

The results led to the development of a conceptual model that captures the complexity of collaboration between HCPs and parents. The model highlights multiple interrelated factors that influence collaboration, such as shared understanding, trusting relationship and parental empowerment. Rather than prescribing a one-size-fits-all approach, the model underscores the need for tailored collaboration, adjusted to the unique context of each family and HCP.

By making the underlying dynamics of collaboration explicit, this model provides HCPs with practical guidance on how to shape and adapt their collaborative practices within family-centred care. This study contributes to the growing body of knowledge that recognises parents as active partners in early intervention, and offers tools to help HCPs strengthen parents' collaborative role in daily practice.

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1.8. Social preferences as human capital: intergenerational transmission in an ethnically diverse context

Prosociality is a fundamental skill in human societies and is linked to many long-run positive economic outcomes. Many factors shape prosociality during early childhood - a key stage in skill development - but the interactions among those factors remain understudied. In this paper, we study how ethnic identity and parental influence are associated with social preferences. To do so, we elicit social preferences across 1,000 parent-child pairs from both ethnic majority and minorities in Bulgaria using survey- and task-based items. We find that majority individuals are more pro-social towards majority receivers and minority individuals are more pro-social towards minority receivers. Across parents, minority parents allocate relatively fewer resources to majority receivers, and across children, majority children allocate fewer resources to minority receivers. Finally, we find that parents' pro-sociality is associated with child's pro-sociality. More prosocial parents tend to have more prosocial children. Our results suggest that this transmission appears to be driven by ethnic majority households.

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1.9. Development at risk! Associations between early child development and risk & protective factors in high-risk families

DEVELOPMENT AT RISK!

Associations between early child development and risk & protective factors in high-risk families

Marjolein Verhoeven, Liesbeth de Paauw-Telman, Lisa Krijnen & Anneloes L. van Baar
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AIMS

In the Netherlands, parents facing mental or physical health challenges can seek help through the Social-Medical Indication (SMI)-assistance program. This program enables parents to use regular childcare facilities at no cost, to reduce parental stress and offer children a stable environment. Parents and children (aged 0-6) who entered this program are followed to understand the risk and protective factors affecting these families, the parenting abilities, and children's development.

Here we present the results of Wave 1, when families have entered the program:

(a) the risk and protective factors these families face

(b) the child's cognitive developmental level

(c) associations between risk & protective factors and children's cognitive developmental level

METHODS

Data were collected for parents and 155 children between 3 and 65 months of age (M = 26.9, SD = 15.7; 56.1% boys)

ESQ (n = 155) — Filled out by parents to assess family **risk** and **protective factors**

Bayley-III-NL (n = 61; 8-28 months)
WPPSI-IV-NL (n = 45; 29-65 months) — Utilized by trained instructors to assess **child's cognitive development**

RESULTS

Figure 1. **ESQ:** Overview of Risk & Protective Factors (N = 155)
Red: risk factor Green: protective factor

Figure 2 & 3. **ESQ:** Overview of Cumulation of Risk & Protective Factors (N = 155)
Red: risk factor Green: protective factor

Figure 4. Division of Children's Cognitive Normscores (Bayley N = 61; WPPSI N = 45)

Table 1. Correlations between cumulative risk & protective factors and child cognitive development

Cumulation of	Bayley (n = 57)	WPPSI (n = 40)
Risk factors	**.31***	-.16
Protective factors	-.16	**.33***
Health (-)	**.24#**	.03
Housing (-)	.16	-.05
Family Life (+)	-.10	**.42****
Finances (+)	-.19	**.30#**
Community (+)	-.15	.15

* $p<.05$; ** $p<.01$; # $p<.10$

DISCUSSION

- The majority of families experience more than 1 risk factor, but also more than 4 protective factors when entering the SMI program.
- Most children scored within the normal range of cognitive development; 24.5% of the children scored < -1 SD – somewhat more than expected, reflecting the risk of the children in this SMI-group.
- For younger children (tested with Bayley; aged 8-28 months), experiencing more risk factors is related to better cognitive performance, whereas for older children (tested with WPPSI; aged 29-65 months) experiencing more protective factors is related to better cognitive performance.

CONCLUSION

Our findings indicate a dynamic interaction between risk factors and protective factors over time: For young children, risk factors initially seem to be related to more rapid development, but when children get older, long-term effects of these risk factors could have negative consequences if unless offset by protective factors.

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1.10. Poster REAL project

Parental support plays a crucial role in shaping infants' curiosity and early language development. This research aims to systematically capture how parents encourage motor and language development in infants aged 8–24 months. A survey was completed by 212 parents, measuring specific parent behaviours, routines, child-outcomes and information about the home context (SES, available toys, family composition, etc.). The questionnaire was designed to be both theory-driven, practically applicable, and provided a way to quantify parental facilitation of motor and language development. By linking caregiver practices to developmental outcomes, this study offers insights for researchers and practitioners into how everyday parenting practices support early language and curiosity. The data of the study are available but still need to be analysed. During the conference, the results of the analysis will be presented.

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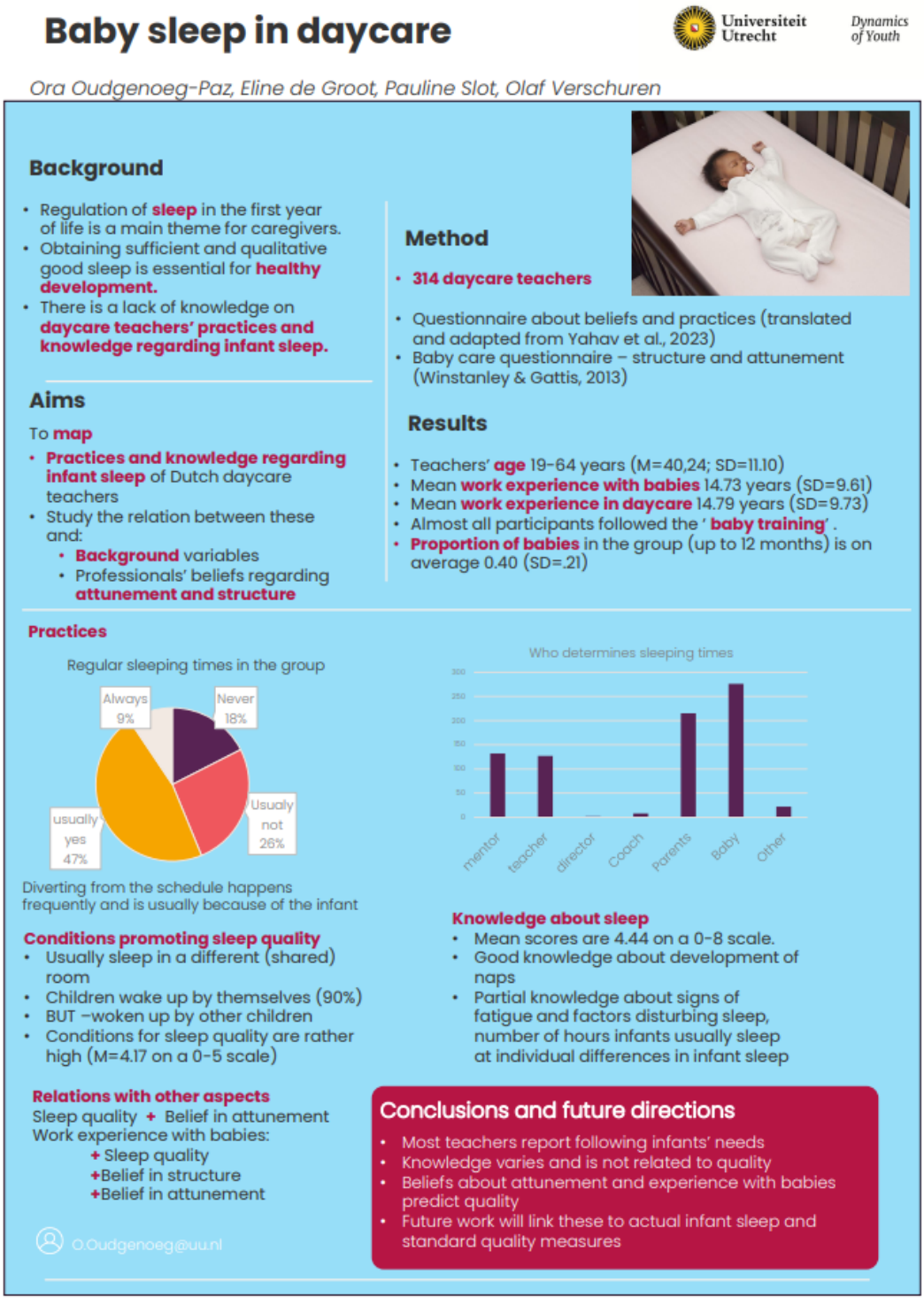
1.11. Baby sleep in daycare



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1.12. The influence of brain maturity on prosodic boundary processing at birth

The influence of brain maturity on prosodic boundary processing at birth

Major Research Project by Tirza van den Eijnde
Supervised by Jorik Geutjes MA, Dr. Caroline Junge and Prof. Dr. Aoju Chen
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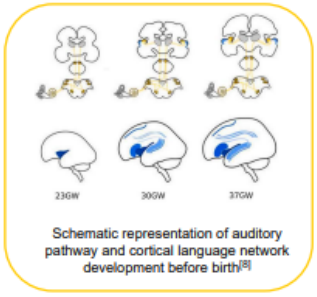
Introduction

- Newborns are familiar with prosody (melody & rhythm) of language due to prenatal linguistic experience
- **Prosodic boundaries** allow infants to segment speech based on three types of cues: pitch change, final lengthening and pause
- Infants are able to process major prosodic boundaries from a very early age.[1-4]
- **Prematurely born newborns**: less matured brain at birth & less linguistic experience
- *RQ: How does brain maturity influence the ability to process prosodic boundaries before birth?*
- Processing of boundaries may be guided by two **biologically motivated innate perceptual biases**:
  - Iambic Trochaic Law (ITL)[5]
  - Biological Codes: Respiratory Code (RC)[6]
- Previously only response found to boundaries marked by pause in frontal and right frontotemporal regions[7]
  - Brain maturity may play a role in explaining the discrepancy between these findings & innate biases



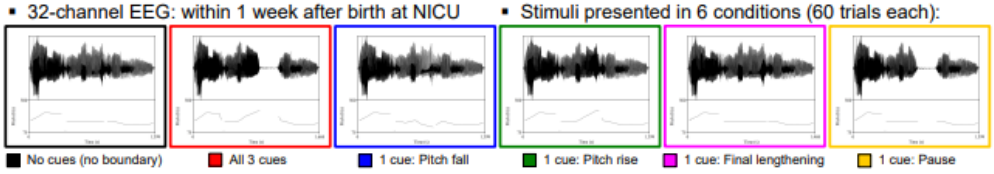
Schematic representation of auditory pathway and cortical language network development before birth[8]

Hypothesis

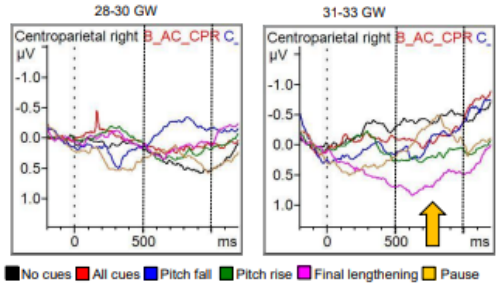
More progressed brain maturity is expected to lead to processing of prosodic boundaries marked by **all individual cues**. In addition, more progressed brain maturity is expected to lead to **more synchronized** and **widespread** processing of prosodic boundaries marked by a pause.

Methodology

- Event-related potentials: Closure Positive Shift (CPS)[9]
- 40 preterm newborns: 28-30 & 31-33 weeks GA
- 32-channel EEG: within 1 week after birth at NICU
- Stimuli: name sequences with/without IP boundary: *[Moni en Lilli en Manu]* vs. *[Moni en Lilli] [en Manu]*
- Stimuli presented in 6 conditions (60 trials each):



Analysis and Results



- 8 brain regions: *frontopolar, frontotemporal L/R, frontocentral, central, centroparietal L/R, parieto-occipital*
- Time window: *500-1000ms after preboundary syllable onset*
- LMEM: *ERP amplitude ~ Condition*Region*Brain maturity*
- Significant interaction: pairwise comparisons
  - **Significant positivity in newborns of 31-33 GW in final lengthening condition, right centroparietal**

Discussion and conclusion

- Positive shift, possibly CPS, found in preterm newborns of 31-33 GW when processing boundaries that are marked by **final lengthening only**.
  - Indicates that brain maturity may play a role in prosodic boundary processing.
  - Suggesting newborns rely on innate biases, e.g. ITL, to segment speech.
- No CPS when all cues are present, including final lengthening, possibly due to **conflicting cues**.
- No differences in synchronization & spreading of the CPS between brain maturity groups; these maturational changes may occur during later stages of brain development

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1.13. Coordinated cues? Gesture and prosody in mother–infant interaction

In everyday life, infants both hear and see people talking [1-3]. Speech in these interactions is typically accompanied by co-speech gestures (hand, head, or eyebrow movements), which are often exaggerated in infant-directed speech (IDS) [4-5]. While auditory aspects of IDS are well studied [6-8], much less is known about the temporal relation between visual cues, particularly spontaneous gestures, and IDS [9-10].

In adult-directed speech (ADS), gestures are typically temporally related to linguistically meaningful elements marked by changes in prosodic parameters such as pitch, duration, and intensity, with gesture strokes (the main movement phase of a gesture) or apexes (the peak moment of that movement) co-occurring with acoustically prominent syllables or phrase boundaries [11-12]. In IDS, gestures depicting meaning tend to co-occur with the corresponding word [13], while head and eyebrow movements often align with the start of prosodic phrases [10].

This study examined the temporal relation between speech and gestures in spontaneous Dutch IDS. Nine Dutch-speaking mothers (mean age 34) interacted with their 5–9-month-old infants across three five-minute sessions. Speech was annotated for intonational phrases (the largest phrase structure in a sentence, which may or may not overlap with grammatical units) and acoustic prominence [14], hand gestures for strokes and apexes [15], and eyebrow peaks were estimated using OpenFace [16].

As hand gestures were infrequent (N=68), only eyebrow peaks were analysed statistically. A paired-samples t-test showed no significant difference in the likelihood of eyebrow peaks (N=780) occurring within prominent words compared to chance ($t(8)=1.29$, $p=.23$). A chi-square test also showed no effect of phrase position ($\chi^2(2)=3.65$, $p=.161$), with most peaks falling outside these intervals.

These findings suggest that in Dutch IDS, spontaneous eyebrow and hand gestures do not reliably align with word-level prominence or phrase boundaries, contrasting with results from lab-based IDS and ADS studies.

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1.14. Adolescents' Relationship with their Parents as Predictor of Parenting Motivation in Adulthood

People differ in the degree to which they are motivated to care for offspring, and these individual differences may in part be rooted in experiences with ones own parents. The objective of the current study was to examine whether levels and changes in parent-adolescent relationship quality (closeness, parental and adolescent dominance, and conflicts) between age 13 and 18 predicted the motivation for caring for, protecting, and liking (young) children in adulthood. In addition, we tested whether predictive associations differed depending on parental status and gender.

Data from 1,039 participants were included, who were on average 13.5 years old (sd = 2.1) during the first wave, and 29.7 years old (sd = 2.6) during the last wave. In adolescence, participants and both their mothers and fathers reported on closeness, dominance, and conflicts in their relationship. In adulthood, participants reported on three forms of parenting motivation. These included caring (e.g., "When I see infants, I want to hold them"), protecting (e.g., "I would feel compelled to punish anyone who tried to harm a child"), and liking (e.g., "When I hear a child crying, my first thought is "shut up!"" (R)).

Levels of closeness between adolescents and their parents positively predicted all three forms of parenting motivation (caring, protecting, and liking), whereas levels of adolescent reported parental dominance positively predicted protecting, and father reported adolescent dominance negatively predicted protecting. Few and contrasting association were found for conflicts between parents and adolescents. Changes in the parent-adolescent relationship did not predict parenting motivation. Associations were not dependent on parental status or gender

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2.1. Milk Intranasal Therapy (MINT) in neonates with Post-Haemorrhagic Ventricular Dilatation: A safety and feasibility study

Preterm infants are at high risk to develop neurological complications, such as post-haemorrhagic ventricular dilatation (PHVD) following severe intraventricular haemorrhage. PHVD arises from impaired cerebrospinal fluid (CSF) drainage, causing increased mechanical pressure to the periventricular white matter. Subsequent inflammation and oxidative stress further drive neurodegeneration and disrupt brain development, ultimately leading to long-term neurodevelopmental impairments.

Current treatment is supportive (e.g. lumbar puncture or drain placement), but therapies targeting inflammation or neurodegeneration are needed to improve outcomes for infants with PHVD. Human milk supports immune regulation and brain development in preterm infants. Human milk contains a rich repertoire of bioactive components, including extracellular vesicles (EVs), neurotrophic factors and cytokines, that may positively impact brain health by exerting immunomodulatory and neurotrophic effects. Interestingly, these separate components have shown promising results as intranasal therapies to treat preterm brain injury.

In an open-label study, we hypothesize that it is feasible and safe to intranasally administer fresh milk plasma (milk devoid of fat and cells) from the neonate's own mother to PHVD neonates. Fifteen eligible infants will receive at least 7 doses of milk plasma over 14 days. Primary outcomes include safety, defined by adverse events and tolerability, and feasibility, defined by sufficient fresh milk expression for at least 7 interventions, and successful milk plasma processing and administration within two hours of expression. Exploratively, we will analyse routinely collected CSF before and after intranasal treatment for potential changes in neuroinflammatory, and neurotrophic markers, thereby providing preliminary insight into potential mechanisms of action. Other explorative outcomes are brain development by MRI, and long-term developmental outcomes compared to historical untreated PHVD control patients.

If the intranasal administration of milk plasma is proven safe and feasible, this approach may provide a natural, minimal invasive, biologically safe and cost-effective therapeutic option for newborns with PHVD.

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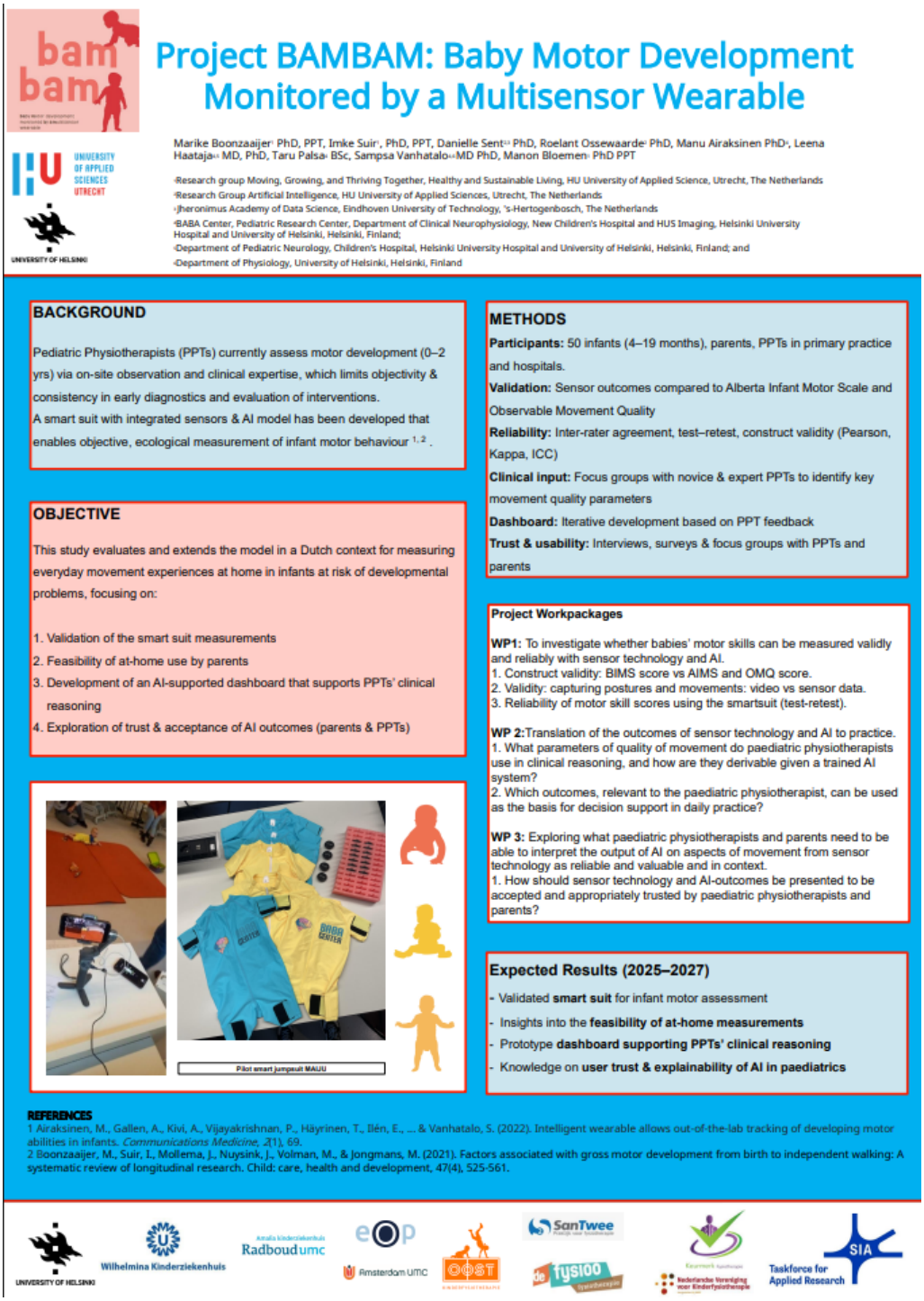
2.2. Project BAMBAM: BAby Motor development, monitored By A Multisensor wearable



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2.3. The power of interaction: How turn-taking and screen time affect language development in children with and without DLD

Language is essential for communication and societal participation, yet around 7% of children experience severe language problems. These children are diagnosed with developmental language disorder (DLD) and face academic and social challenges. High-quality parent-child interactions are crucial for language acquisition, also for children with DLD. Therefore, early treatment of DLD includes parent training programs to enhance parent-child interactions. Although parent training is generally effective, our understanding of the components driving its success, and the underlying mechanisms, remains limited. My project focuses on two potentially critical factors: turn-taking and screen time.

Research shows that turn-taking – the back-and-forth exchange during interaction – is (a) linked to better child language outcomes and (b) limited in DLD. We currently do not know why this is the case. Study 1 employs a detailed, moment-by-moment analysis to identify what aspects of turn-taking explain these findings. Further, this study will identify parental strategies that increase the child's active involvement during interaction. Study 2 is the first to examine screen time by children with DLD and their parents – a topic that has raised concerns about its implications for language development. I will investigate how different types of screen time (e.g., passive versus interactive) associate with language outcomes, whether associations are mediated by turn-taking, and whether associations differ for children with and without DLD.

The project will make use of day-long audio recordings of parent-child interactions at home and automated speech analysis. The findings will deepen our understanding of how a child's language environment affects their language development and will thereby contribute to language acquisition theory. By identifying effective strategies to support parent-child interactions and by providing guidelines on screen time, the project will provide insights that will help children with DLD and their families.

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2.4. Effects of shared word order on intrasentential mixing in English-Dutch, Polish-Dutch, and Turkish-Dutch bilinguals

When multilinguals mix their languages, they take into account grammatical constraints of both languages and tend to mix where the word order of both languages overlaps. In experimental settings, word order can be primed, allowing for the systematic investigation of word order constraints on children's mixing behavior. Sentence repetition may be a useful experimental task to study such effects. Previous research shows, in general, children have more difficulties processing and repeating sentences that contain mixed language. These difficulties are especially apparent when the switches are ungrammatical or require more grammatical integration. However, no research on mixed sentence repetition has considered basic word order overlap, and the relative positions of the subject (S), object (O), and verb (V). In main clauses, Dutch has a similar word order as English and Polish (SVO), while in subordinate clauses Dutch word order overlaps with Turkish (SOV). In this study, we use a novel mixed sentence repetition task in which English-Dutch, Polish-Dutch and Turkish-Dutch bilingual children (age 4-7) repeat different types of sentences that contain mixed language in either the main or subordinate clause. Using this task, we aim to a) study whether bilingual children have difficulty repeating sentences containing mixed language, b) examine whether bilingual children's ability to repeat mixed sentences is facilitated by shared word order, c) explore the effects of type of mixing (i.e., insertion and alternation) on bilingual children's ability to repeat mixed sentences, and d) study the relation with mixing experience in daily life. We control our analyses for age and language balance. Results from this study will inform us about the processing costs associated with language mixing and reveal important distinctions in language mixing behavior between different groups of multilingual children.

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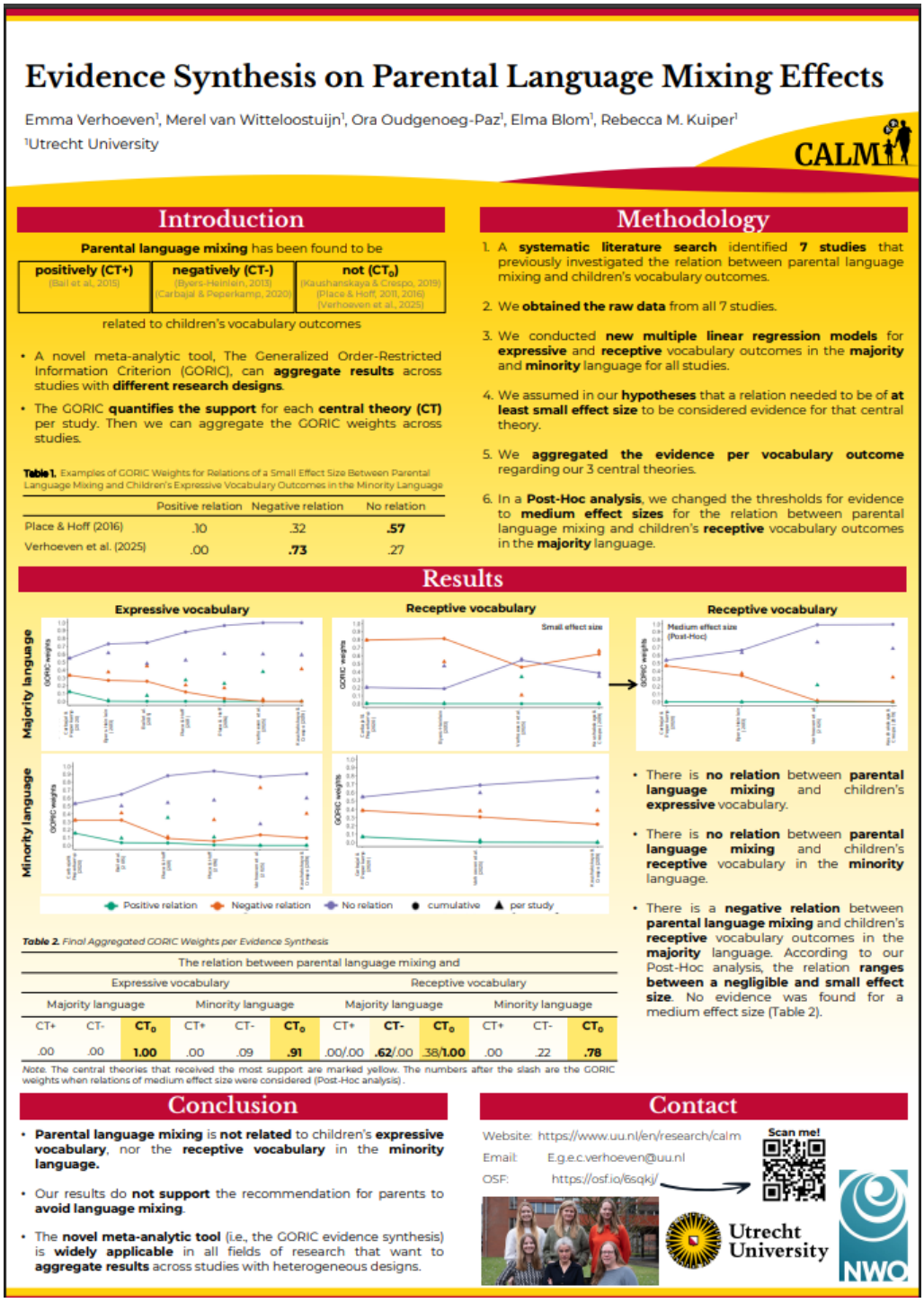
2.5. Evidence Synthesis on Parental Language Mixing Effects



Evidence Synthesis on Parental Language Mixing Effects

Emma Verhoeven[1], Merel van Witteloostuijn[1], Ora Oudgenoeg-Paz[1], Elma Blom[1], Rebecca M. Kuiper[1]
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CALM

Introduction

Parental language mixing has been found to be

positively (CT+)	negatively (CT-)	not (CT_0)
(Bail et al., 2015)	(Byers-Heinlein, 2013) (Carbajal & Peperkamp, 2020)	(Kaushanskaya & Crespo, 2019) (Place & Hoff, 2011, 2016) (Verhoeven et al., 2025)

related to children's vocabulary outcomes

- A novel meta-analytic tool, The Generalized Order-Restricted Information Criterion (GORIC), can **aggregate results** across studies with **different research designs**.
- The GORIC **quantifies the support** for each **central theory (CT)** per study. Then we can aggregate the GORIC weights across studies.

Table 1. Examples of GORIC Weights for Relations of a Small Effect Size Between Parental Language Mixing and Children's Expressive Vocabulary Outcomes in the Minority Language

	Positive relation	Negative relation	No relation
Place & Hoff (2016)	.10	.32	**.57**
Verhoeven et al. (2025)	.00	**.73**	.27

Methodology

1. A **systematic literature search** identified **7 studies** that previously investigated the relation between parental language mixing and children's vocabulary outcomes.
2. We **obtained the raw data** from all 7 studies.
3. We conducted **new multiple linear regression models** for **expressive** and **receptive** vocabulary outcomes in the **majority** and **minority** language for all studies.
4. We assumed in our **hypotheses** that a relation needed to be of **at least small effect size** to be considered evidence for that central theory.
5. We **aggregated the evidence per vocabulary outcome** regarding our 3 central theories.
6. In a **Post-Hoc analysis**, we changed the thresholds for evidence to **medium effect sizes** for the relation between parental language mixing and children's **receptive** vocabulary outcomes in the **majority** language.

Results

Table 2. *Final Aggregated GORIC Weights per Evidence Synthesis*

The relation between parental language mixing and											
Expressive vocabulary						Receptive vocabulary					
Majority language			Minority language			Majority language			Minority language		
CT+	CT-	CT_0	CT+	CT-	CT_0	CT+	CT-	CT_0	CT+	CT-	CT_0
.00	.00	**1.00**	.00	.09	**.91**	.00/.00	**.62**/.00	.38/**1.00**	.00	.22	**.78**

Note. The central theories that received the most support are marked yellow. The numbers after the slash are the GORIC weights when relations of medium effect size were considered (Post-Hoc analysis).

- There is **no relation** between **parental language mixing** and children's **expressive** vocabulary.
- There is **no relation** between **parental language mixing** and children's **receptive** vocabulary in the **minority** language.
- There is a **negative relation** between **parental language mixing** and children's **receptive** vocabulary outcomes in the **majority** language. According to our Post-Hoc analysis, the relation **ranges between a negligible and small effect size**. No evidence was found for a medium effect size (Table 2).

Conclusion

- **Parental language mixing** is **not related** to children's **expressive vocabulary**, nor the **receptive vocabulary** in the **minority language.**
- Our results do **not support** the recommendation for parents to **avoid language mixing**.
- The **novel meta-analytic tool** (i.e., the GORIC evidence synthesis) is **widely applicable** in all fields of research that want to **aggregate results** across studies with heterogeneous designs.

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2.6. Methodological variability in the analysis of auditory ERP studies in infants and young children at risk of dyslexia

In recent decades, ERP studies have examined neurophysiological responses to auditory stimuli in infants and preschoolers at risk for developmental dyslexia. Although some results suggest that infant ERPs may serve as early predictors of dyslexia, findings between studies vary to great extent in terms of timing, location and effect size.

Aiming to facilitate understanding what existing studies offer and considering the need for replication studies, we investigated main methodological choices in 24 studies and found:

(1) Because the field lacks standards for EEG processing, comparability between studies is limited due to major methodological variability, especially in time window selection, i.e., the choice of how long after the stimulus signals are considered for analysis.

(2) Ten studies had incomplete reports of the design (e.g., inclusion criteria, age range), repeatedly the description of EEG signal processing was incomplete, and in several studies the interpretation of the signals appeared to rely on individual judgment.

(3) Statistical issues, including the use of small samples (especially the group at family risk), omitting multiple comparisons correction, and data leakage (circularity).

While point (3) may compromise the validity of these studies' results, points (1) and (2) raise concerns about potential bias, or even result manipulation.

A positive observation is that, generally, newer studies demonstrate more solid methodological and reporting across all reviewed aspects, alongside using larger study cohorts. Future research should prioritize transparent reporting, methods that minimize subjective interpretation, and preregistration.

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2.7. ‘Home is the Most Boring Play Space’: Exploring Children’s Risky Play in Greek Neighborhoods Through Play-Along Interviews

This study explores children’s risky play experiences in the neighborhood context. Risky play refers to exciting and challenging forms of play where children take age-appropriate risks, such as climbing trees, high-speed running, or rough-and-tumble play. Although vital for children’s physical, socio-emotional, and cognitive development, risky play has declined dramatically in recent decades.

While the importance of supporting risky play is increasingly recognized, most existing research has been limited to structured environments (e.g., schools, childcare centers), emphasized adult perspectives – often prioritizing safety over excitement – and relied on data from specific countries, especially in Northern Europe, like Norway and the UK. To address these limitations, this study: (1) examines risky play in the neighborhood context, (2) centers children’s perspectives as the primary experts on their own play experiences, and (3) provides insights from Greece, a Southern European country which is significantly under-researched.

Participants were 41 primary-school children (aged 6–12) and their parents, based in two neighborhoods in Thessaloniki, Greece – one urban (21 children) and one suburban (20 children). Children participated in “play-along interviews” in small groups of 2-4 friends (14 groups total), and their parents completed a short socio-demographic survey. Using a child-adapted version of the “go-along” method, we accompanied children through their neighborhoods as they played without constant adult supervision, allowing them to lead the way and engage in (risky) play.

Grounded in socio-ecological systems theory and affordance theory, this study investigates how physical and social aspects of residential environments shape risky play. Conducting interviews during real-time play provided nuanced insights into how factors like green space, traffic, and social safety affect children’s play behavior.

By expanding the focus beyond play-designated settings and adult views, this study contributes to more inclusive, context-aware understandings of early childhood play and its implications for child-friendly urban design and policy.

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2.8. Camera-based Assessment of Gendered Toy Preference in Free-Play Parent-Child Interactions

This paper explores gendered toy preference in parent-child interactions. We focus on free-play, which allows for unique natural and dynamic interactions in which toy preferences might be less constrained by the experimental setting.

We operationalize toy preference through the child's visual focus of attention (VFOA). Our analyses of 25 interactions of 12-13 minutes each reveal statistically significant differences between boys and girls in terms of time spent looking at a doll and a jump box. We then investigate whether these effects can also

be obtained through automated analyses of the video data. To this end, we leverage an automated VFOA algorithm to predict which toys are attended to. Our automatic algorithm reveals similar patterns as when using manual annotations, albeit with less statistical power. Using dual-camera inputs significantly

enhances the accuracy and reliability of our approach under challenging acquisition conditions. We demonstrate that our analyses can be used to deepen our understanding of children's gendered behaviors and show the potential of automated video analysis in advancing developmental psychology research

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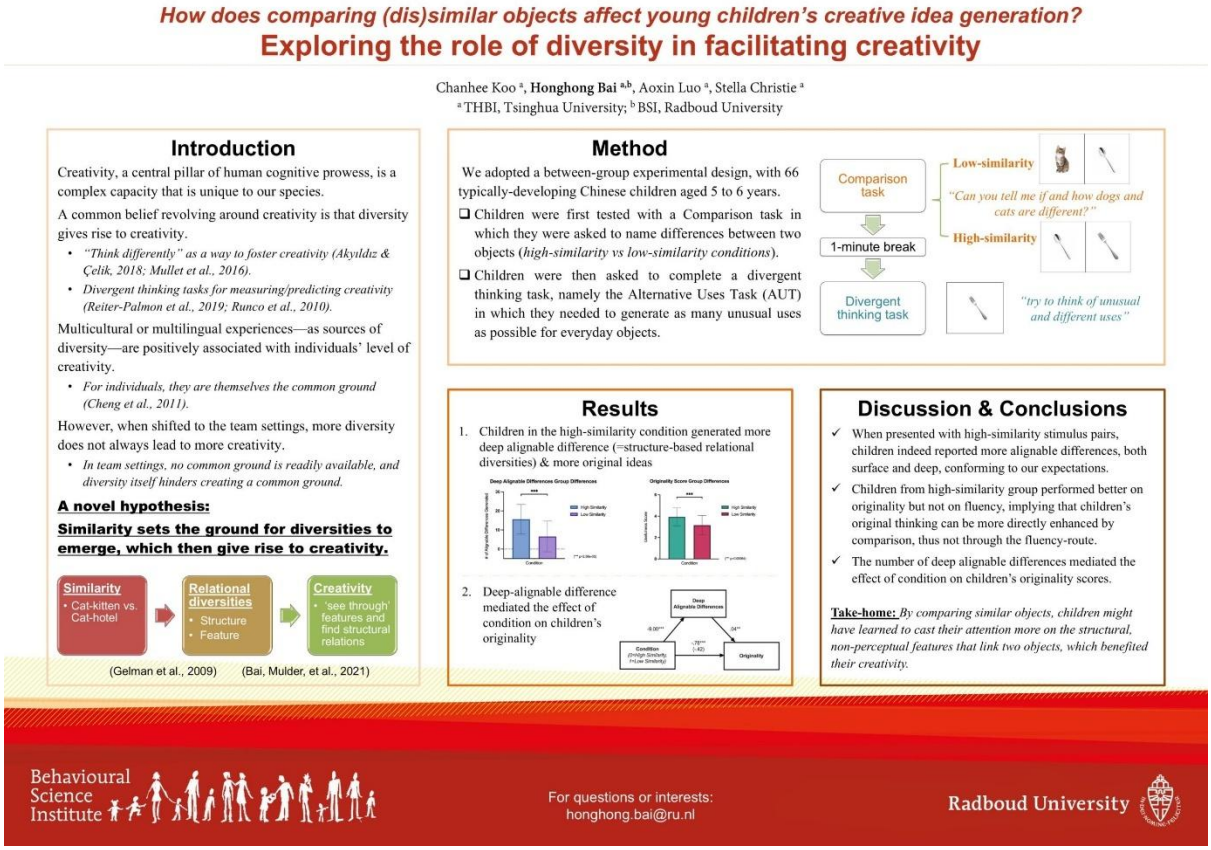
2.9. How does comparing (dis)similar objects affect young children's creative idea generation? Exploring the role of diversity in facilitating creativity.



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2.10. Nonword repetition skills of preschoolers with 22q11.2 Deletion Syndrome and peers with Developmental Language Disorder are weak, but differently associated with vocabulary

Nonword repetition skills of preschoolers with 22q11.2 Deletion Syndrome and peers with Developmental Language Disorder are weak, but differently associated with vocabulary

3T ONDERZOEK

Utrecht University
Institute for Language Sciences

UMC Utrecht

NWO
Netherlands Organisation for Scientific Research

Background

22q11.2 deletion syndrome (22q11DS) is a genetic condition
previously known as Velocardiofacial or DiGeorge syndrome

- Speech and language difficulties
- Psychiatric and cognitive problems
- Physical abnormalities, incl. the palate
- Incidence 1:2000-4000
- Most prevalent after Down Syndrome

Bron: Stichting Steun 22q11.

Language development in 22q11DS

- 95% of children with 22q11DS have a speech-language disorder (Solot et al., 2019) with problems across all domains (Everaert et al., 2023).
- Expressive grammar skills in 22q11DS are remarkably similar to those in children with DLD, despite differences in etiology and intellectual ability (Boerma et al., 2023)

Nonword repetition in 22q11DS

- Preserved or strong nonword repetition in 22q11DS (De Smedt et al., 2008; Majerus et al., 2006/2007), as well as verbal memory in general (Everaert et al., 2021; Rakonjac et al., 2024), in contrast to what we know from DLD.

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Netherlands Organization for Scientific Research (NWO) OC [360-89-080] & Veni [VI.VENI.201T.016]

Research questions

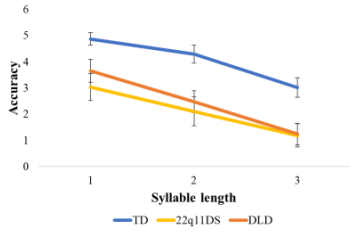
1) Do children with 22q11DS, compared to peers with DLD, have a distinct profile of preserved nonword repetition skills in the context of impaired language abilities?
2) Are nonword repetition skills differentially related to language abilities in children with 22q11DS in comparison with peers with DLD?

Methods

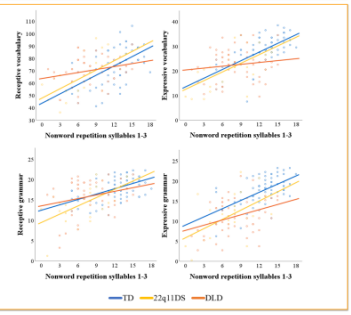
	N	f/m	*M* age (*SD*)	*M* IQ (*SD*)
22q11DS	40	18/22	63.1 (13.0)	80.6 (11.8)
DLD	63	13/50	60.6 (10.2)	97.3 (12.9)
TD	77	43/34	56.8 (10.5)	106.6 (13.0)

Nonword repetition: 18 items – 1, 2 and 3 syllables (Verhagen et al., 2019)
Language abilities: receptive vocabulary (PPVT-III-NL), expressive vocabulary, receptive grammar, expressive grammar (CELF Preschool-2-NL)

Results RQ 1



Results RQ2



Conclusion

1) No – nonword repetition skills of both children with 22q11DS and peers with DLD are weak, at least at preschool age.
2) Yes (partly) – nonword repetition skills of children with 22q11DS and TD children, in contrast to children with DLD, are related to vocabulary. There is no evidence for differential relations between nonword repetition and grammar in the groups.

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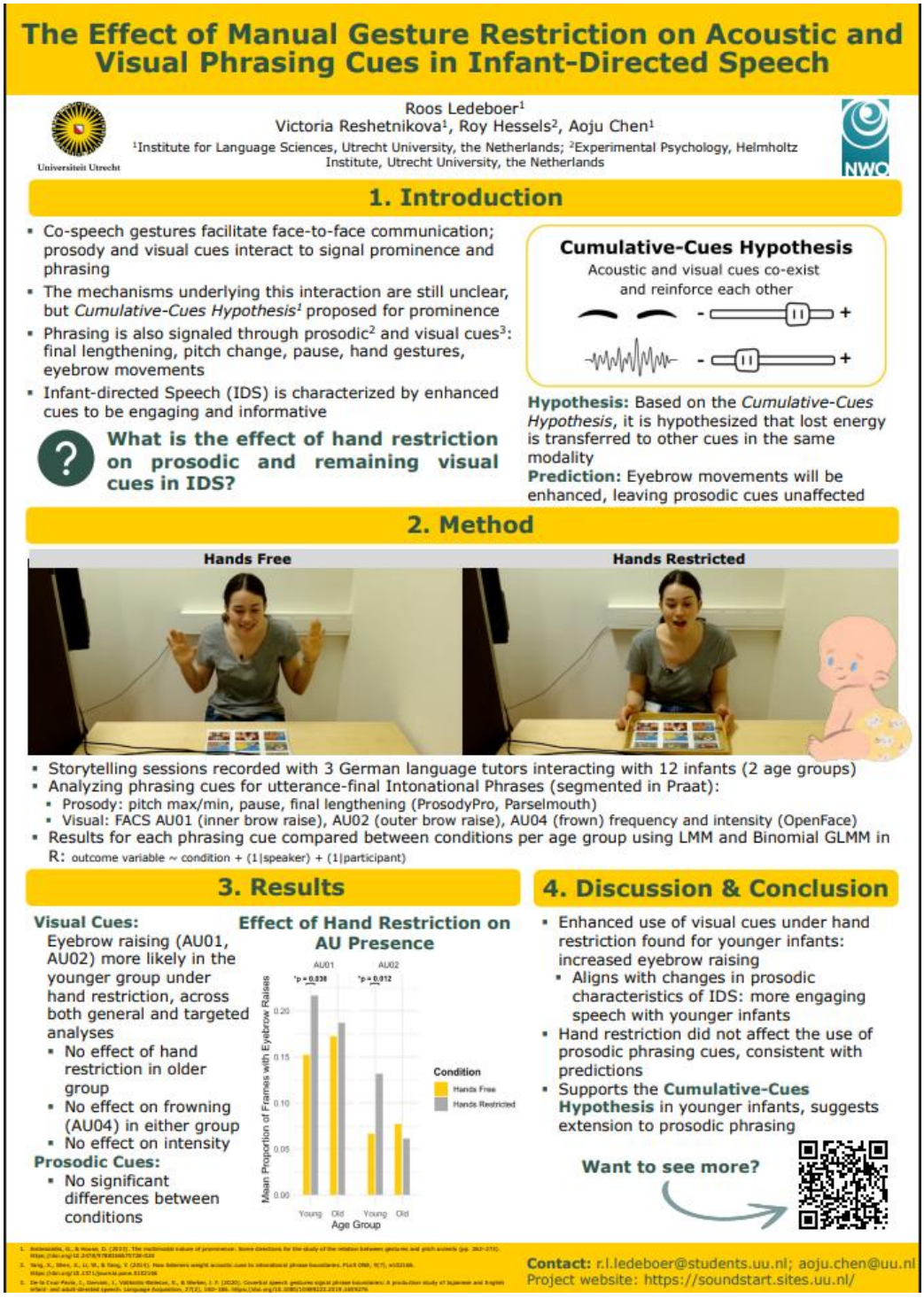
2.11. Multimodal Prosodic Phrasing in Infant-Directed Speech: Testing the Cumulative-Cue Hypothesis with Gesture Restriction



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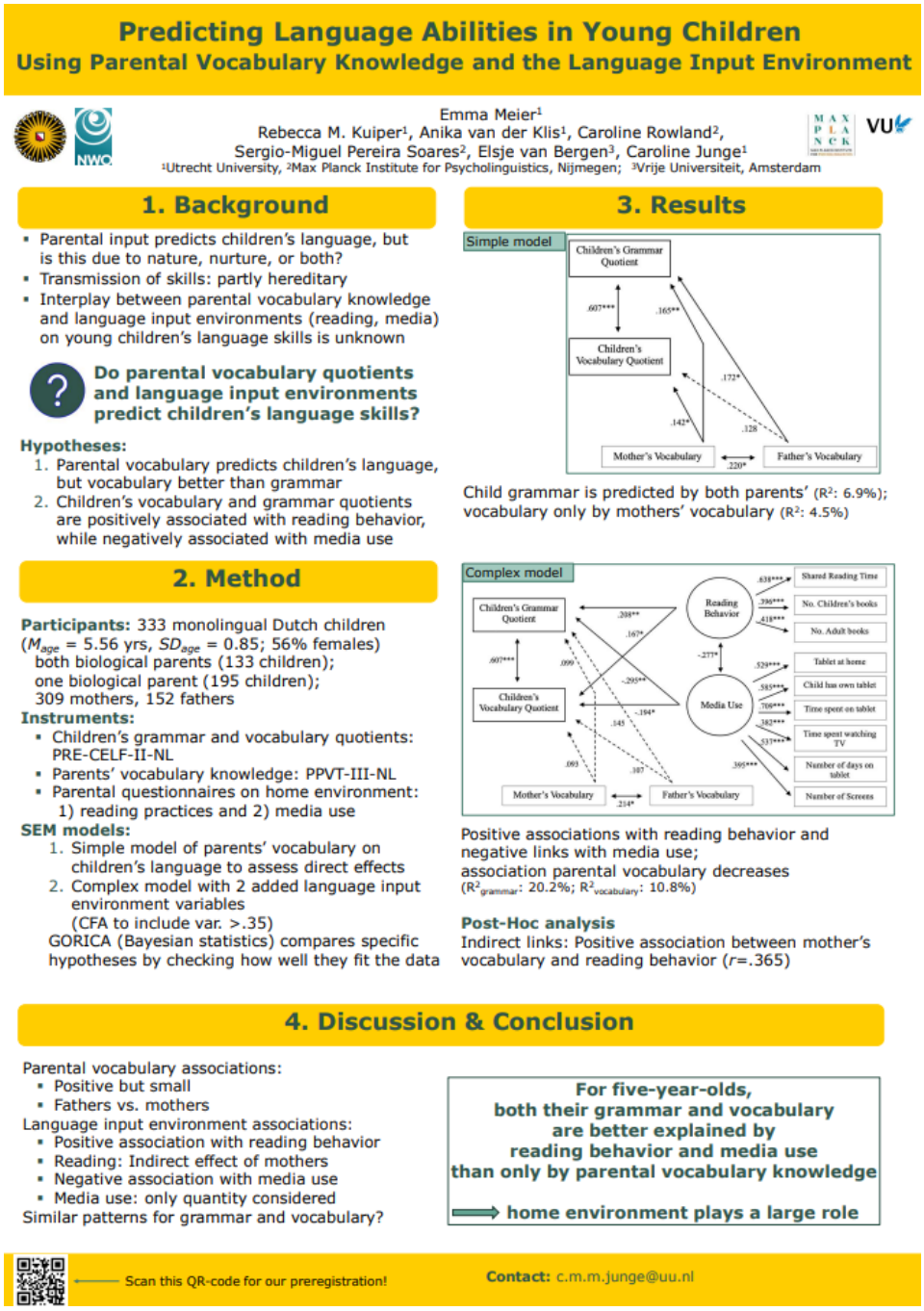
2.12. Predicting Language Abilities in Young Children: Parental Vocabulary Knowledge and the Language Input Environment



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2.13. The origin of social bonding through shared experiences in a smartphone dominated world

Many mechanisms of social bonding are common to all primates, but humans have developed some that are unique to the species. These involve various kinds of interactive experiences - from watching a movie together to having a conversation - whose common feature is the triadic sharing of experience. In a previous series of studies with adults, children and great apes, we have shown that humans bond through shared experiences in a special way, by creating mutual awareness of their experience being shared. However, currently, the earliest ontogeny of this capacity to bond through shared experiences remains elusive. I will therefore present the outline of a new Veni project (starting in November 2025), containing two new studies in which we will explore this early development. In one study, we will explore when toddlers (12-18 months) start to base their decisions on whom to interact with on previous shared experiences, and in a second study we will examine when infants (9-12 months) start to develop positive attitudes towards puppets who share experiences with them using an eye tracking experiment. In both studies, we will also look at the effect on parents' phone use around their children on the emergence of this capacity.

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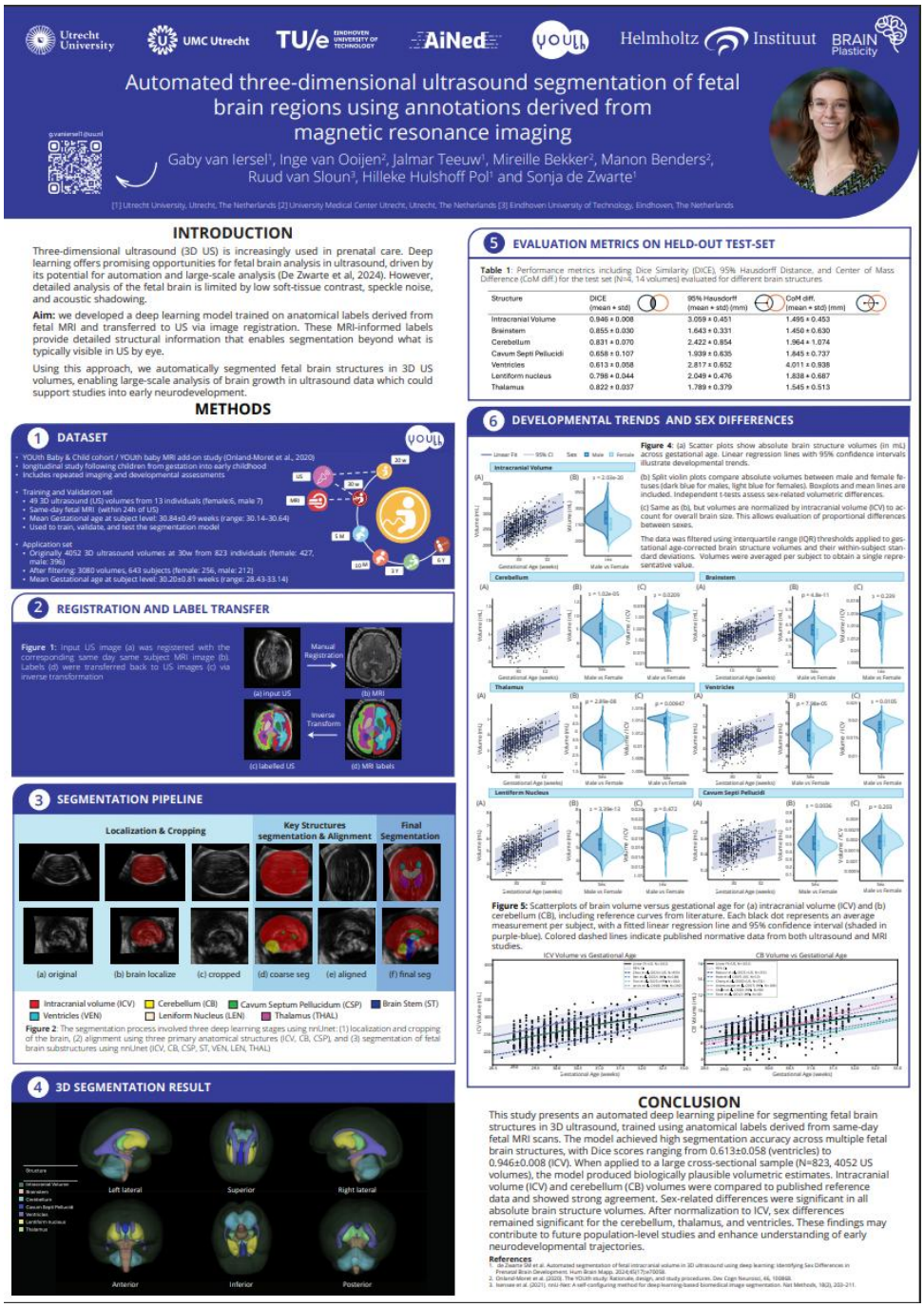
2.14. Automated three-dimensional ultrasound segmentation of fetal brain regions using annotations derived from magnetic resonance imaging



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