Project Number: CC018

Title: Do early communication behaviours of infants born with cleft palate vary by cleft subtypes?

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Scientific Outline:

The aim of this proposal is to investigate the range of early developmental communication skills in children born with cleft palate and to determine if there are differences in patterns between children of different cleft types. We will use data collected from the Cleft Collective Speech and Language Study, specifically the parent questionnaires (Developmental Snapshot Assessment, DSA) completed when the child participants are aged 13months and the Automatic Vocalisation Assessment (AVA) score, which is one of the measures automatically calculated by the LENA (Language Environment Analysis) programme.

It is established that up to 50% of individuals with a cleft palate +/- cleft lip will experience speech, language and communication needs at some point in their development (Albery 1989; Peterson-Falzone, Karnell & Hardin-Jones 2010). Evidence from National data published by The Cleft Registry and Audit Network (CRANE) report (2017) suggests only 35.8% of children with BCLP were rated to have 'normal speech' at age 5 (CRANE 2017) in contrast to 71.3% of children with isolated cleft palate. The previous three CRANE Annual Reports (2015/16/17) all highlight statistically significant differences in the proportion of children with 'normal speech' aged 5 according to cleft type, with children with BCLP having the worst outcomes.

Willadsen et al. (2018) note that it is possible to assess speech development by early communication behaviours, even before a child uses her/ his first word. Whilst it can be difficult sometimes to obtain a clear picture of a child's communicative competence in a clinical setting, evidence from the literature suggests the caregiver is a critical judge of infant repertoire and can provide a similar level of data to phonetic transcription (Ramsdell et al. 2012). Interestingly, multiple researchers have demonstrated that phonetic transcription grossly overestimates parents report of their child's syllable inventory (Ramsdell et al. 2012) thus adding further value to parent reported outcomes at this pre-linguistic stage of speech and language development.

It would be useful for clinicians working with individuals with cleft palate if we were able to identify if there are any further increased risk factors such as cleft type that can be signaled at this very early stage of speech and language development. This proposal therefore aims to use data from the Cleft Collective to determine the range of early communication behaviours of children born with cleft palate, as reported by parents and observed from speech sampling. We will consider whether patterns vary by cleft type and future work will determine whether there is a relationship between patterns of early communication behaviours and later outcomes, thus assisting in the early identification of children for prioritization of intervention in the clinical setting.

The sample will consist of infants recruited to the Cleft Collective Speech & Language study. Participants will have parent/ caregiver reported DSA scores which will form a standardised measure of the infant's language level, and AVA data which is a measure of the infants' patterns of vocalizing and forms part of the Language Environment Analysis (LENA) data. LENA recordings are completed when the infant is 13 months of age, and the parental questionnaire is completed at the same time. There are currently 182 participants with data available for this study.

Following initial descriptive work to describe the range of early communication behaviours for the sample as a whole, these data will be compared across cleft types and associations explored using either an ANOVA or a Kruskal Wallis test (this will be dependent on the distribution of the AVA score) Although babble and early communication are regarded as robust milestones in the non-cleft population (Oller 1980; Stark 1980, Oller et.al 1999) data on other variables with potential to affect early speech and language development, including gender, timing of palate surgery, parental Socio-Economic-Status (SES), English as an Additional Language (EAL) and presence of a syndrome, will be explored and potentially used as confounding variables within a regression analysis to explore any relationship that may be present.

This research proposal has potential to lead on to other research questions including the comparison of these early communication behaviours between cleft type and with the non-cleft population.

Preliminary findings from this study may indicate further specific study of the LENA data using Timestamper Analysis (Willadsen et al. 2018), which will provide additional variables on the level of complexity in the child's babbling and the consonant inventory at age 13months, to examine relationships between early speech behaviours and different cleft types. The onset of canonical babble has been proven within the literature to have well-established links to early language development (Stoel-Gammon 1998; Menyuk 1986, Vihman & Greenlee, 1987). Although the current literature would suggest infants born with cleft palate vocalise as much as non-cleft infants (Scherer et al. 2008) other aspects of babbling are compromised in infants with cleft palate. Infants born with cleft palate are known to produce fewer oral stops than their non-cleft peers (Chapman et. al 2009). Whilst differences between the cleft palate and non-cleft population have been identified, what has not been established is if there are differences between cleft types at this very early stage of communication. This research proposal forms the first stage of beginning to answer this question.