

Facial features associated with Prenatal Alcohol Exposure (PAE) in Newborn Infants using 2D & 3D imaging



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Conflict of interest disclosure

Dr Aiton, Dr Suttie, Dr Huang, and Professor Noble do not have an affiliation (financial or otherwise) with a pharmaceutical, medical device or communications organization, and cannot identify any conflict of interest

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And is part of a larger study looking at the neurofacial effects of PAE

Ethics Statement

This study received UK regional Ethics Committee and NHS Health Research Authority (HRA) approval (IRAS reference number 241498)

There are no conflicts of interest which could lead to potential bias and need to be managed

Background

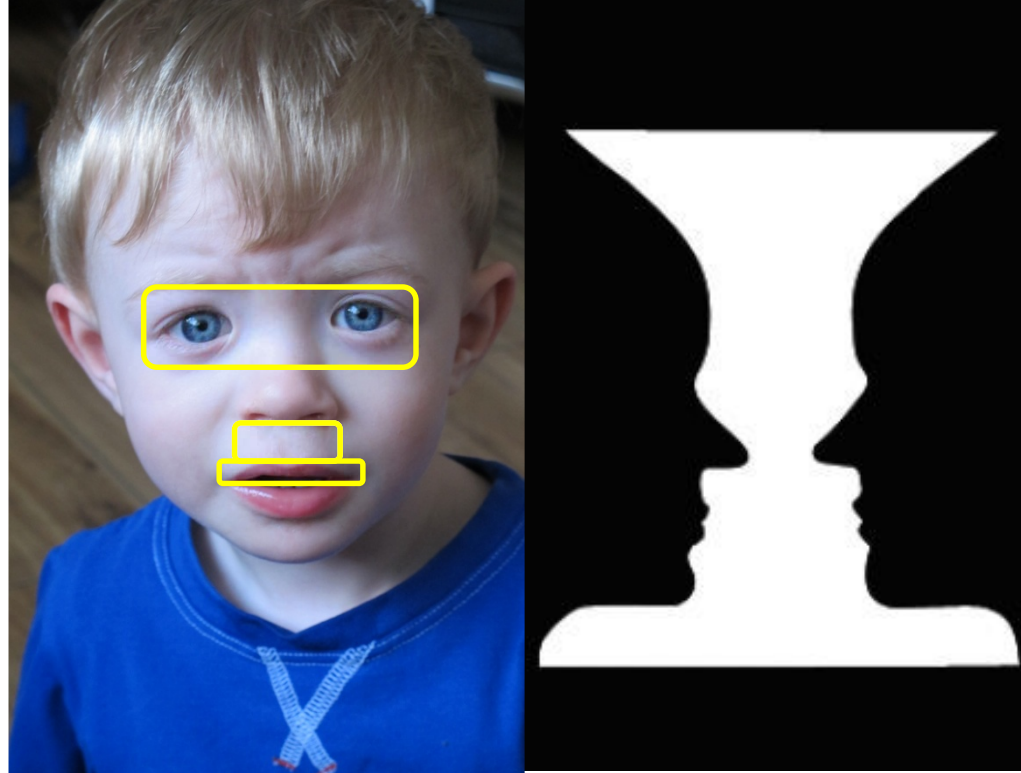
Standard 2D assessment

University Washington, Seattle (Astley)

- Palpebral fissures
- Philtrum
- Lip circularity

Plus:

Assessment of midline facial profile

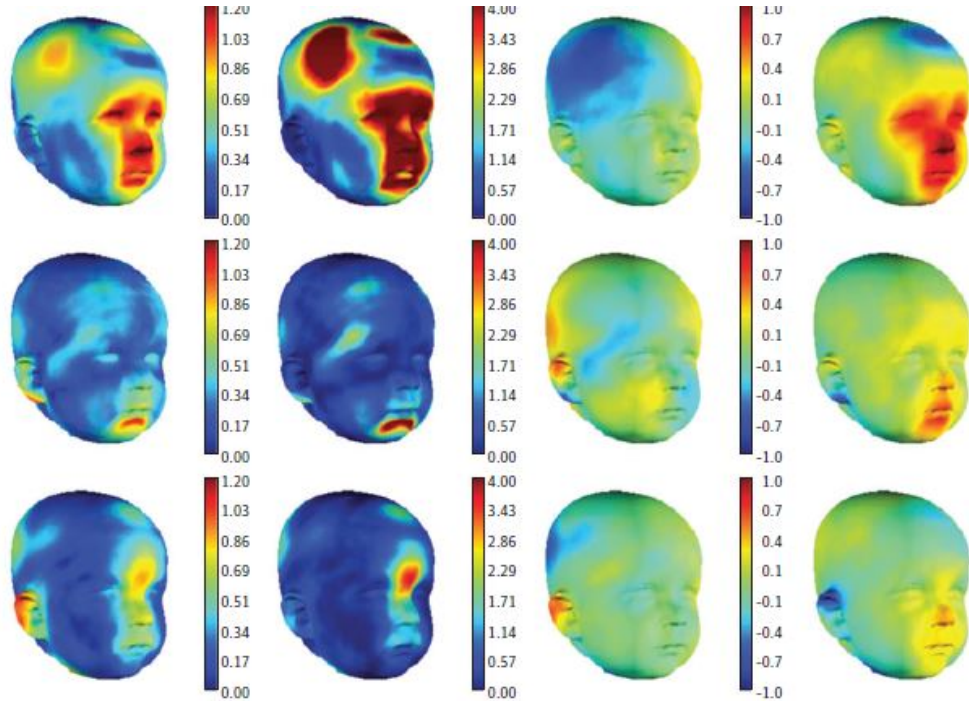


Background 2

3D assessment

- Are there additional important features?
- Does this add sensitivity?
- Comparison with 2D?

COMPLEXITY



Methodology

Recruitment

- Postnatal ward – NHS teaching hospital
- Specialist perinatal substance misuse clinic

- Anonymous Questionnaire: lifestyle/alcohol consumption
- Birth weight, head circumference, length
- Standard photos: frontal, 3-quarter, lateral profile
- 3D photographs (Vectra, Canfield Scientific)

3D photos



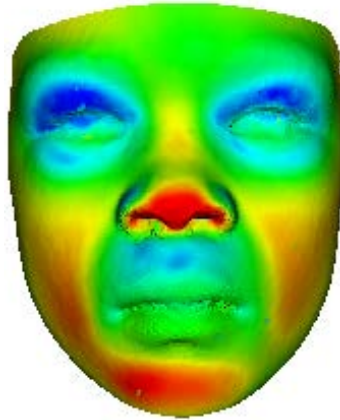
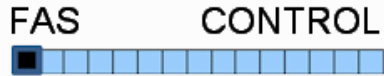
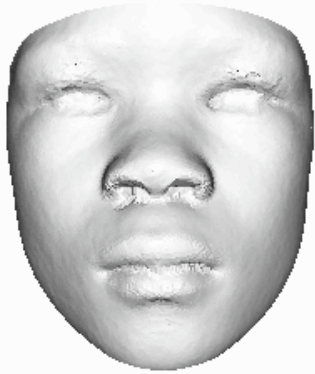
Results

Anonymous Questionnaire: recalled alcohol consumption prior to pregnancy, changes in response to pregnancy and during the last month

☐ see **Poster 01** for interim partial analysis

Analysis: according to PAE - **4 groups**

- None
- Moderate to high levels of PAE (mostly substance misuse clinic) meeting threshold criteria (Canadian guidelines 2016)
- [Low levels of PAE: < 4 units/week]



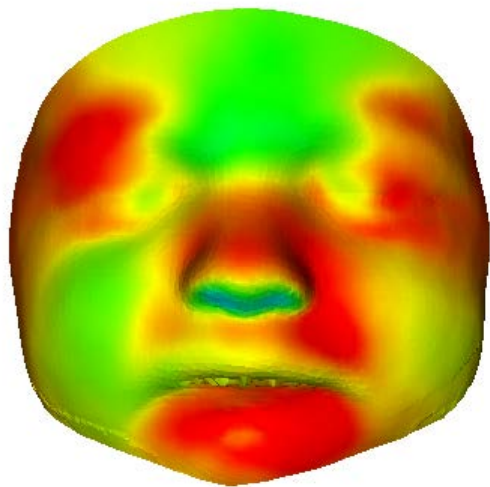
Hypoplastic midface
Flat nasal bridge
Long philtrum
Anteverted nares
Retrognathia

FACE SIGNATURE

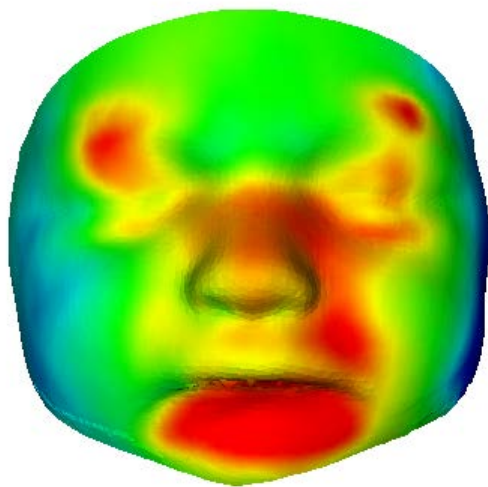
FACE SHAPE
NORMALISED
AGAINST CONTROLS

Red- 2 S.D.
deflated
Blue- 2 S.D.
inflated
Green-
coincident

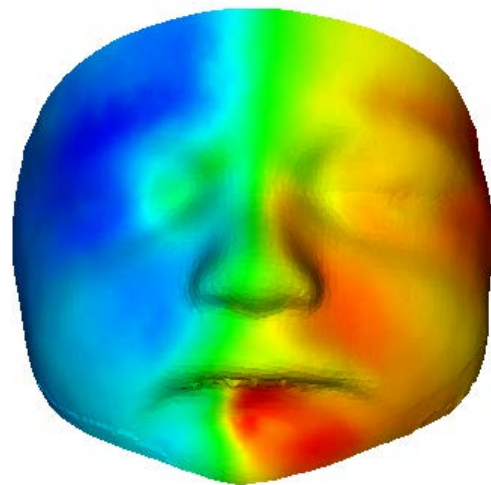
3D - PAE compared with unexposed *(Early example)*



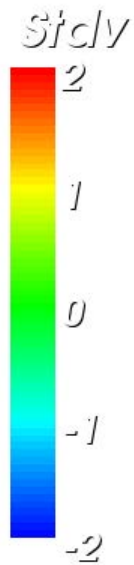
SURF->NORM



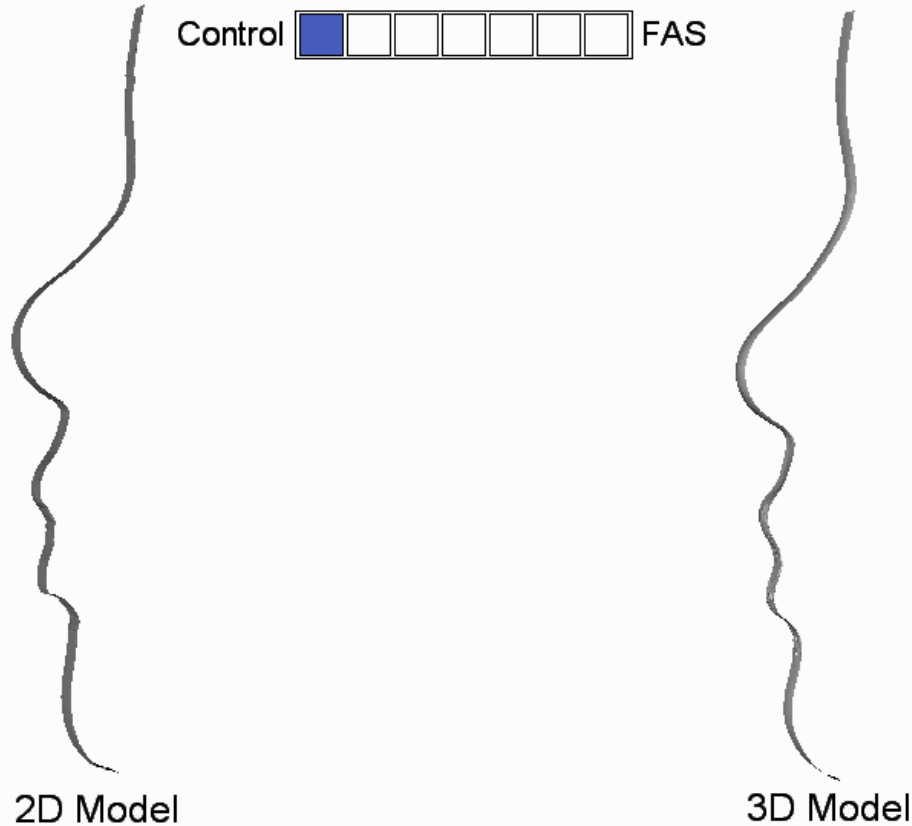
Z (depth) Axis



X (lateral) Axis



2D compared with 3D profile



Further work in progress

- Refining the model for normal values (unexposed)
 - Recruitment still in progress
- Comparison of significant PAE to control
- Comparison of low level PAE (<4 units/wk) to control
- Discrimination: 2D profile v. 3D model profile (PAE)
- CIFASD repository

Conclusion



- Greater complexity
- Relationship exposure/diagnosis
- Does that give better diagnostic discrimination?
- Profile – probably important
 - (Low resource areas)
- UTILITY depends on complexity / simplicity

Thank you

