



THE UNIVERSITY
of EDINBURGH

COMPARISON BETWEEN DEAF AND
HEARING LEARNERS FROM AREAS OF
SOCIAL DEPRIVATION

Standardised measures of assessment
during the first 3 years of schooling

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COMPARING OUTCOMES

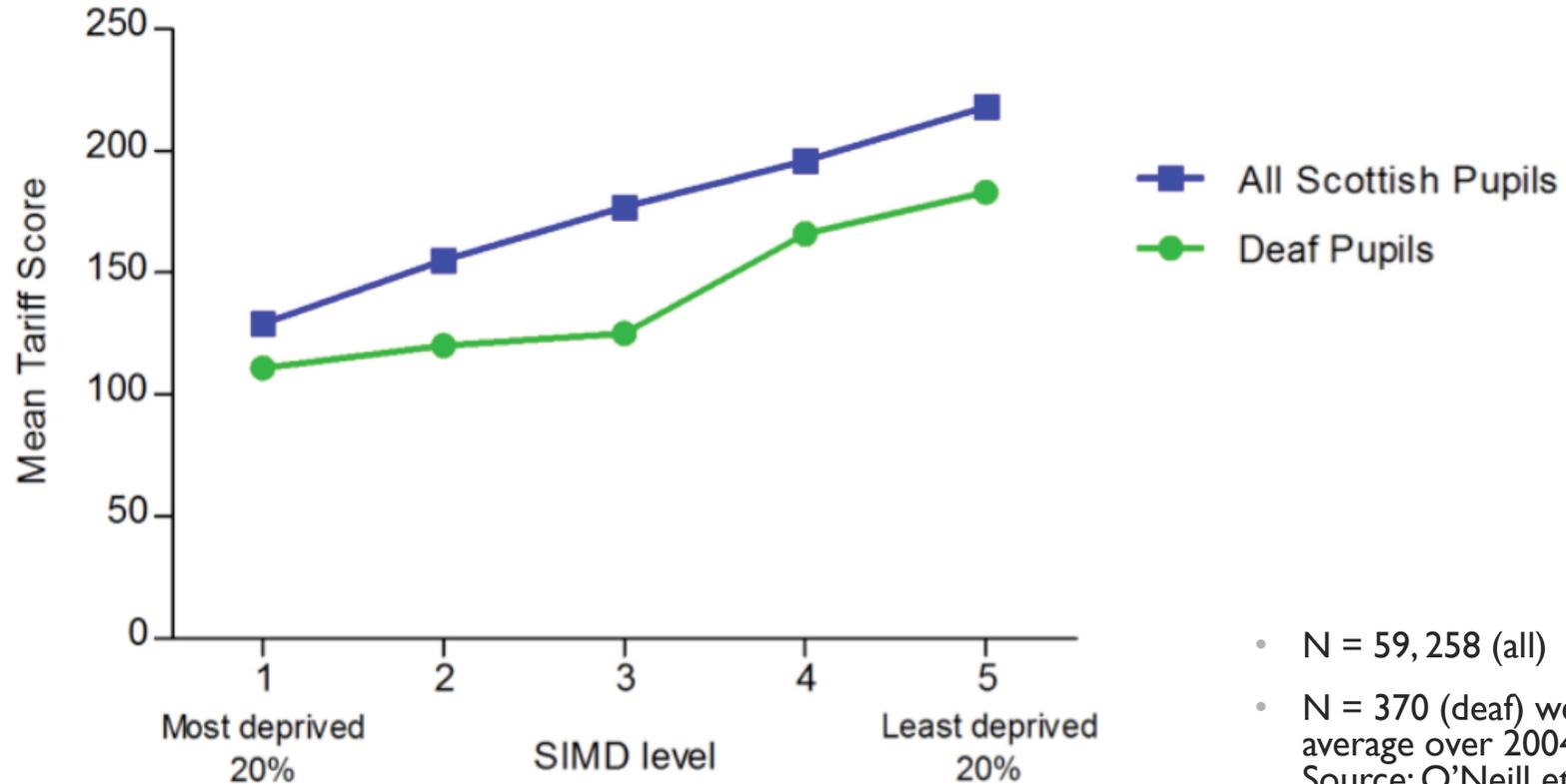
HEARING LEARNERS AND DEPRIVATION

- Literacy - . Deprivation gap widens from P2 to S2. For the most socially deprived, the gap is 13% in P2 and 22% by S2.
- Writing, listening and talking - 6%-point gap between those in SIMD 1 and 5
- Numeracy - 21, 22 and 28 percentage points at primary 4, 7 and secondary 2 respectively
- Vocabulary – age 3 & 5 age equivalent scores | 8 month gap (Scottish Government 2015)

DEAF LEARNERS

- English at S4 (age 16) 12% gap compared to hearing children at SCQF 4, and 16% gap at SCQF 5
- 5 or more awards at SCQF level 4 or better 16% gap between deaf and hearing children in S4.
- 5 or more awards at SCQF level 5 or better, 10% gap between deaf and hearing children in S4
- Deprivation effect also evident across the range from poverty to more affluent. (O'Neill et al., 2014)

Comparison of Mean Tariff Score by 5 Socio-economic Quintiles for Deaf and Hearing students by S4



- N = 59,258 (all)
 - N = 370 (deaf) weighted average over 2004 – 2010
- Source: O'Neill et al. (2014)

LISTENING IN THE CLASSROOM

- Adequate acoustic signal (Leibold et al 2007)
- Linguistic knowledge (Ronnberg et al 2014)
- Experience (Moore 2012)
- Cognition (Hallgren 2005)

ACOUSTIC BARRIERS TO LEARNING

- External and internal noise pollution (Shield and Dockrell, 2008)
- Multiple speech sources in a room (Viswanathan et al 2016)
- Reverberation (Klatte et al 2010)

YOUNG LEARNERS' CHALLENGES TO LEARNING IN CLASSROOMS

HEARING LEARNERS

- Auditory immaturity (Boothroyd 1997)
- Spatial segregation (Arbogast et al. 2002)
- Energetic and informational masking
- Knowledge of linguistic rules

DEAF LEARNERS

- Auditory immaturity
- Spatial segregation
- Energetic and informational masking
- Knowledge of linguistic rules
- Distortion and attenuation (Plomp, 1978)

RESEARCH QUESTION AND HYPOTHESES

- **Research Question:** What differences are there in attainment outcomes across the primary years of deaf compared to hearing children, using academic and socio-economic indicators?
- **H1:** Early language levels and cognitive ability correlate strongly with educational outcomes at the end of Primary.
- **H2:** Deaf children from more affluent backgrounds have more positive outcomes than those living in deprivation.
- **H3:** Hearing children from more affluent backgrounds have more positive outcomes than those living in deprivation.
- **H4:** Deaf learners and those hearing learners living in areas of deprivation have similar educational outcomes.

SAMPLE

HEARING

Selected based on:

- school Scottish Index of Multiple Deprivation (SIMD) ranking 1 (poverty) or 5 (affluence) (Scottish Executive 2008)
- enclosed classrooms
- School roll > 150
- N = 501

DEAF

Selected based on:

- Referral from NHS audiology
- Permanent or ongoing deafness
- Registered on Fife Council Sensory Register
- N = 287

NATIONAL ASSESSMENTS

- Achievement for Excellence /Interactive Computerised Assessment System (INCAS)
- Durham University
- Benchmark Primary 1 and end of Primary 1
- Primary 3
- Adaptive assessment
- Computer based
- Automatically marked

SUBJECT AREAS ASSESSED

PRIMARY 1 (AGE 4-5)

- Baseline assessment.
- Literacy - including handwriting, vocabulary acquisition, understanding reading fundamentals, phonological awareness, letter, word and pattern recognition and comprehension
- Numeracy - including ideas about maths, quantity and spatial position, identifying numbers, counting, identifying shapes, problem solving and simple arithmetic

PRIMARY 3 (AGE 7-8)

- Reading – word recognition, word decoding & comprehension
- Spelling
- Numeracy – general mathematics and mental arithmetic
- Picture vocabulary
- Non-verbal ability

DATA

- Scottish Index of Multiple Deprivation from postcode
- Standardised and age equivalent scores from INCAS (PI x2, P3, P5 and P7)
- Teacher assessments at each level: Early /First / Second (ages 4 – 12) and phase within level: Emerging, Developing and Secure
- Age of identification of deafness
- Degree of deafness
- When aided
- Presence of additional disability (Hendar & O'Neill, 2016)

ANALYSIS

- Analysing deaf and hearing children's results by SIMD
- Comparing deaf and hearing children's results by SIMD
- Finding children who are 2 or more phases behind or ahead of the mean (9 phases because 3 at each curriculum level)
- Further work on a regression analysis to examine effect of age of identification, additional disability, SIMD, degree of deafness in model built in stages.

DATA ANALYSIS IN PROGRESS - METHOD

EC	EC	EC		EC	EC	EC		ES	ES	ES
ES	EC	EC		EC	EC	EC		1C	1C	1C
ED	EC	ED	61	EC	EC	EC	77	ES	ES	ED
EC	EC	ED	69	ES	ES	ES	69	1C	1C	1C
ED	ED	ED	48	ED	ED	ED	59			
1D	1D	1D	120	ES	ES	ES	123	2D	1S	1C
			73				81	1D	1D	1D
								1D	1D	1D
EC	EC	ES	91	ES	ES	ES	108	1C	1S	1C

3 or more phases ahead
2 phases ahead
1 phase ahead
On Track
1 phase behind
2 phases behind
3 or more phases behind

POSSIBLE IMPLICATIONS

- Factors such as degree of deafness & age of identification may have been given too much prominence when determining levels of support.
- National data provides a framework for informed decision making.
- Attainment of deaf children should be seen as part of the national priority to raise attainment amongst learners living in deprivation.
- TODs' expertise in language development could contribute to national priority of raising attainment for all.

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