The Real Markers of Success in cochlear implantation in young children: Social Skills & Theory of Mind

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No Disclosures
Age appropriate speech and language is possible by 3 years (Ching, 2011). This trajectory can be improved and maintained at 4 & 5 years &...
What makes language and communication successful?
Well Spoken “Language”

- But “COMMUNICATION”

= how it is used
Social Skills: Ways of dealing with others to create **positive interactions**; the route to **creating and developing relationships**, Learnt through experience with peers/parents

Social Inclusion: The **connectedness** of the individual with their social setting rather than purely their ‘presence’
Theory of Mind: The ability to make **inferences** about the **beliefs** and desires of other people. Mentally put ourselves in another’s shoes and have a sense of what they are thinking/feeling.

*A predictor of key social childhood competences: e.g., social interactional skills, and consequently interactions and peer popularity* (Wellman & Liu, 2004)
Neuro Linguistic

Linguistic/ Cognitive

Pragmatic

**Lexical enrichment**
(the child gains from acquiring a rich mental-state vocabulary)

**Syntactic enrichment**
(the child gains from acquiring syntactic tools for embedding one thought in another)

**Pragmatic enrichment**
(the child gains from conversations where varying perspectives on a topic are articulated).
Morphological changes are hallmarks of sensory deficits. What influence does this architectural change have on ongoing development? Harnessing neuroplasticity.

Embedded structures - relationship to meaning and comprehension. Implications for language based assessment?

Mental state language
Knowledge and opportunity

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When faced with threat of being stigmatized, to seemingly protect themselves, individuals disconnect from social supports, therein reducing their coping or adaptive capacity. (Hogan et al. 2012)

What happens when social skills; pragmatics and ToM are compromised?
Typical Acquisition

Diverse desires: people like different things
Diverse beliefs: people think different things
Knowledge access: seeing (or hearing!) is knowing
False beliefs: people can think something that I know is not true
Real vs apparent emotion: people can pretend and hide how they feel.

Atypical + Delayed Acquisition

Could not conceive someone liking or believing differently to themselves
HOWEVER
Passed knowledge access & false belief (? insight into what someone is thinking but more impersonal/concrete).

Acquiring skills in an appropriate developmental order
BUT NOT
An appropriate number of skills for their age
Translational research n=50

**Age at assessment (yrs) n=50**
- 3yrs 7.5%
- 4yrs 38%
- 5years 55.5%

**Symmetry n=50**
- Unilateral Hearing Loss 26%
- Bilateral Hearing Loss 64%

**Devices**
- Cochlear Implant n=30
- Hearing Aid n=8
- Baha n=1
- Bone Conductor n=2
- Unilateral Cochlear Implant n=5
- No Device n=4

**Hearing Levels**
- Bilateral >90dBHL
- Bilateral 75-89dBHL (4FA better ear)
- Bilateral 55-74dBHL (4FA better ear)
- Unilateral
Atypical & Delayed TOM

Atypical & Delayed Hearing
Average Age 5.7yrs
(Atypical 8%)

Typical Hearing
Average Age 5.7yrs
(Atypical 8%)

(Bilateral HL
(Atypical = 62%
p=0.0004)

Unilateral HL
(Atypical =45%
p=0.0005)

(Wellman & Liu, 2004)
Atypical & Delayed Hearing

Typical Hearing
Average Age 5.7yrs
(Atypical 8%)

Bilateral HL
(Atypical = 62% p=0.0004)

Unilateral HL
(Atypical = 45% p=0.0005)

Atypical/delayed acquisition

Diagram showing the percentage of children with typical, atypical, or delayed acquisition of language.
Does socio-economic status matter?

Socio-economic Indexes for Areas (SEIFA) Ranking

Typical acquisition
Atypical/delayed acquisition

Lowest SES

Highest SES
Hearing levels & Device Type

All children with additional needs that impact learning had atypical/delayed acquisition

Typical Hearing Average Age 5.7yrs (Atypical 8%) (Wellman & Liu, 2004)

Bilateral CI >90dbHL  Bilateral CI 55-89dbHL  Bilateral HA 55-89dBHL  Unilateral

% Typical acquisition
% Atypical/ Delayed acquisition
The influence of Age

Best standard language scores are for children implanted <12 months, irrespective of residual hearing, and some children with moderate SNHL using HA fitted < 12 months.
Timing important

Typical Hearing
Average Age 5.7 yrs
(Atypical 8%)
(Wellman & Liu, 2004)

Bilateral >90dBHL
CI < 12 Months

Bilateral >90dBHL
CI < 12 Months

Bilateral 55-89dBHL
Cl < 12 Months

Bilateral 55-89dBHL
CI > 12 Months

% Typical acquisition

% Atypical/Delayed acquisition
Considerations for development in children with hearing loss

- **SES**
- **Birth Order**
- **Languages other than English**

**No effect**

**Observed Impact**

- Age of Implant
- Unilateral vs Bilateral (more typical acquisition for unilateral)
- Additional needs that impact learning (all children had atypical/delayed pattern)

**Possible Impact**

- CI under 12 months
- Listening Skill (69% with Atypical/delayed acquisition are in the range of concern)
- Hearing level (linked to age of optimal access and device compliance)
- Language exposure
Considerations for development in children with hearing loss

- Identification
- Amplification
- Intervention
- Language level
- Degree of hearing loss
- Changed sensory pathways

Overhearing
- Optimising access
- Distance /BGN
- Tonal Detection
- Focusing of specific language structures
- Assistive listening devices

Intervention
- Parental input
- Opportunity to fail
- Service delivery
- Direct and indirect learning
- Use of mental state language
- Concrete vs abstract

The Shepherd Centre
Giving deaf children a voice
Practical Translation: Confident Kids

- **Neurological enrichment** (harnessing neuroplasticity providing opportunity).
- **Lexical enrichment** (the child gains from acquiring a rich mental-state vocabulary)
- **Syntactic enrichment** (the child gains from acquiring syntactic tools for embedding one thought in another).
- **Pragmatic enrichment** (the child gains from conversations where varying perspectives on a topic are articulated).

- Informing parents about the development of social interaction and providing opportunity for exposure for children has a positive effect for both in the development of social skills.
- While ToM is strongly correlated to the development of social & pragmatic skills further analysis is required to understand the links between atypical/delayed acquisition and what this means for social and pragmatic skill development.
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References


Rebecca Saxe: How we read each other's minds | TED Talk ...