Effectiveness of teletherapy at facilitating language development in at-risk children with hearing loss

Matthew Fitzgerald, Ph.D.
Stanford University
Disclosures

- Funding for BabyTalk program provided by
  - Oberkotter Foundation
  - Anonymous donor

- Fitzgerald is on the Esolutions advisory board for Advanced Bionics
The BabyTalk team

Joy Keams

Kathleen Sussman

Michael McKechnie

Stanford University
Children with cochlear implants

- Usually need special services to facilitate language development.

- Delivery of services is increasingly challenging for ‘at-risk’ children
  - Low socioeconomic status
  - Low levels of caregiver education
  - Possible language or cultural barriers
  - Distance from clinical services
BabyTalk teletherapy program

Parent-coaching model to deliver listening and spoken language therapy

Weingarten Children's Center

Stanford Medicine
Otolaryngology
Head & Neck Surgery

Stanford University
BabyTalk Demographics

- Over 120 children to date have enrolled in BabyTalk (0-3.5 years of age)
- Over 70% are CCS (Medicaid)
- 25% of mothers have less than high school education
- 36% have high-school education
- Only 41% are monolingual English
Definition of ‘at-risk’

- Primary insurance is CCS (Medicaid) or
- ≤ 12 years of primary caregiver education
- **80% of children in BabyTalk met our definition of ‘at-risk’**
- Non-monoilingual English status itself does not mark a child as ‘at-risk’
Outcome measures

- LittleEars Questionnaire (LEQ)
- Preschool Language Scales (PLS-5)
  - Auditory Comprehension Subscale
  - Expressive Comprehension Subscale
- MacArthur Bates Communication Developmental Index (MBCDI)
- Parenting Stress Index (PSI)
Similar LEQ score improvements for both at-risk and not at-risk children receiving teletherapy.
Improvement on MBCDI also similar for both at-risk and not at-risk children receiving teletherapy.
On PLS-AC standard scores, ‘not at-risk’ improve more than ‘at-risk’ children.
Not at-risk children are more likely to be within 1 SD of their NH peers than at-risk children

- **BEFORE BabyTalk**
  - 27% of ‘not at-risk’ children were within 1 SD of NH peers

- **AFTER BabyTalk**
  - 73% were within 1 SD of NH peers
Not at-risk children are more likely to be within 1 SD of their NH peers than at-risk children

- **BEFORE BABYTALK**
  - 15% of ‘at-risk’ children were within 1 SD of NH peers

- **AFTER BABYTALK**
  - 29% were within 1 SD of NH peers
Summary of data from ‘at-risk’ and ‘not at-risk’ children

• Both groups improved significantly on LEQ and MBCDI

• Not ‘at-risk’ children improved less than ‘at-risk children on the PLS-AC subscale

• At-risk children showed larger reduction of parenting stress
What factors related to teletherapy contribute to these results?

• Focus on PLS-AC for these analyses
  • PLS compares to normative values in children with normal hearing (NH)
  • Could improve on questionnaires, but maybe not enough to keep up with NH children

• Does age of entry into BabyTalk matter?

• Does the amount of teletherapy matter?
Age at which teletherapy began is related to likelihood of improvement on PLS-AC for at-risk children. 5 times more likely to improve if entered BT < 18 months.
No linear relationship between total hours of teletherapy and likelihood of improvement on PLS-AC.
Receiving a critical amount of teletherapy does seem to relate to likelihood of improvement on PLS-AC.

4.5 times more likely to fall behind NH peers if receive less than ~25 hours of teletherapy.
Possible explanations

• Perhaps the parent-coaching skills taught in BT are mastered after a period of time, and additional sessions simply reinforce those skills
  • May need to focus on skill mastery and be more aggressive about altering therapy strategies once goals are met
  • May have implications if resources are limited

• Maybe benefits of additional parent-coaching occur over a longer time frame than we followed these children
Summary and implications

- Teletherapy can facilitate outcomes in children with hearing loss
- Extends benefits of teletherapy to a crucial population of ‘at-risk’ children
- How you assess children matters
- Relationship between teletherapy and improvement is not linear
Things to think about...

• At this point it’s less “can we do it?”

“What’s the most effective and cost efficient way to provide these services?”
Parenting stress decreased in at-risk children, but not for the not at-risk children
Teletherapy density had a minimal effect on PLS-AC
At-risk children are more likely to progress more slowly than their NH peers

- 37% of ‘at-risk’ children decreased
- 9% of ‘not at-risk’ children decreased
BabyTalk Teletherapy Program

- Uses Parent-coaching model to deliver listening and spoken-language therapy
- Social work and audiologic counseling
- Provides therapy for ‘at-risk’ children with limited access to these key services.