



# Relational Health: From research to practice with families of children with autism or hearing differences

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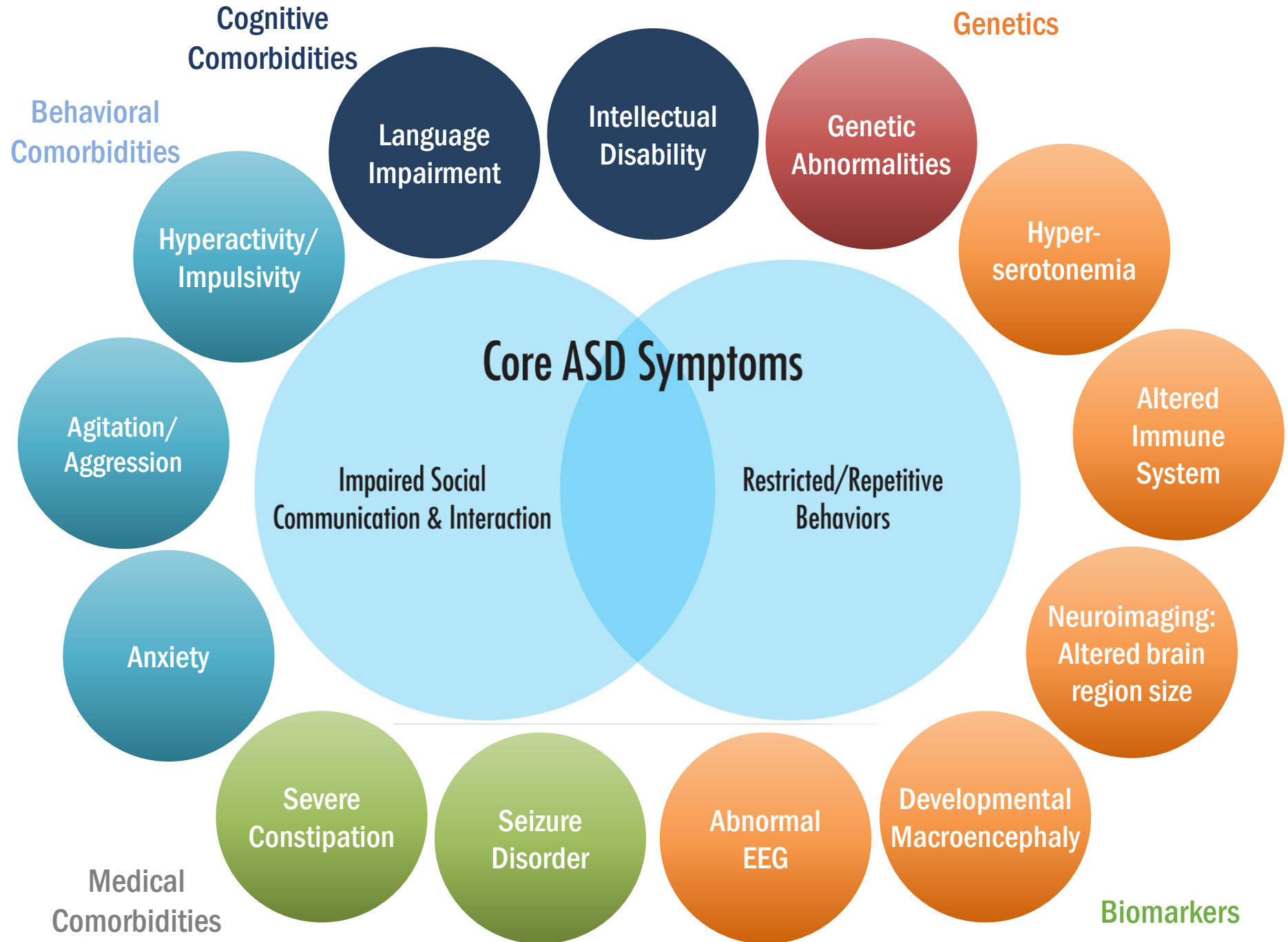
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CALLIER CENTER  
FOR COMMUNICATION DISORDERS

THE UNIVERSITY OF TEXAS AT DALLAS





## Autism

- Reliably diagnosed at 18–24 mos.
- Impaired social cognition is an early indicator of ASD

# Today

- Social cognition
  - Shared emotion stage
    - Mutual eye gaze and social responsiveness, in early intervention
- Pathways early autism intervention that bridges the research-to-practice gap



# COGNITIVE DEVELOPMENT IN THE FIRST TWO YEARS OF LIFE

--Tomasello et al., 2005



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## Social Cognition

SHARING  
EMOTION  
2 mos. +

JOINT  
ATTENTION  
10-24 mos.



# Sharing Emotion (2 months on)



Social smile

Face-to-face (dyadic) interaction

Mutual gazing

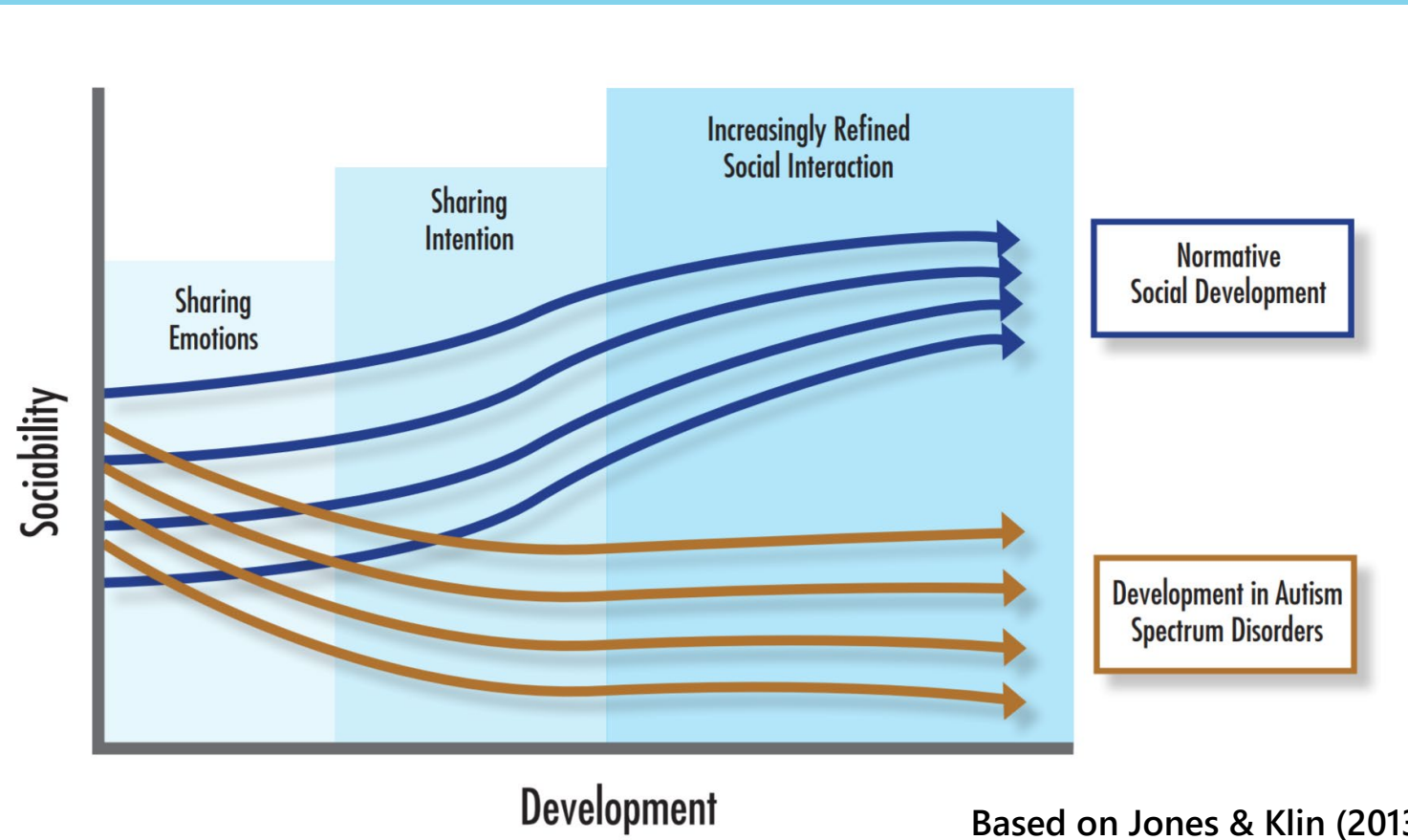
Social responsiveness

Reciprocal to vocalization & facial expressions

Reciprocal exchanges of shared emotions



# Children with ASD show a decline in *eye gaze* between 2-6 mos







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Parent Mediated Early ASD  
Intervention

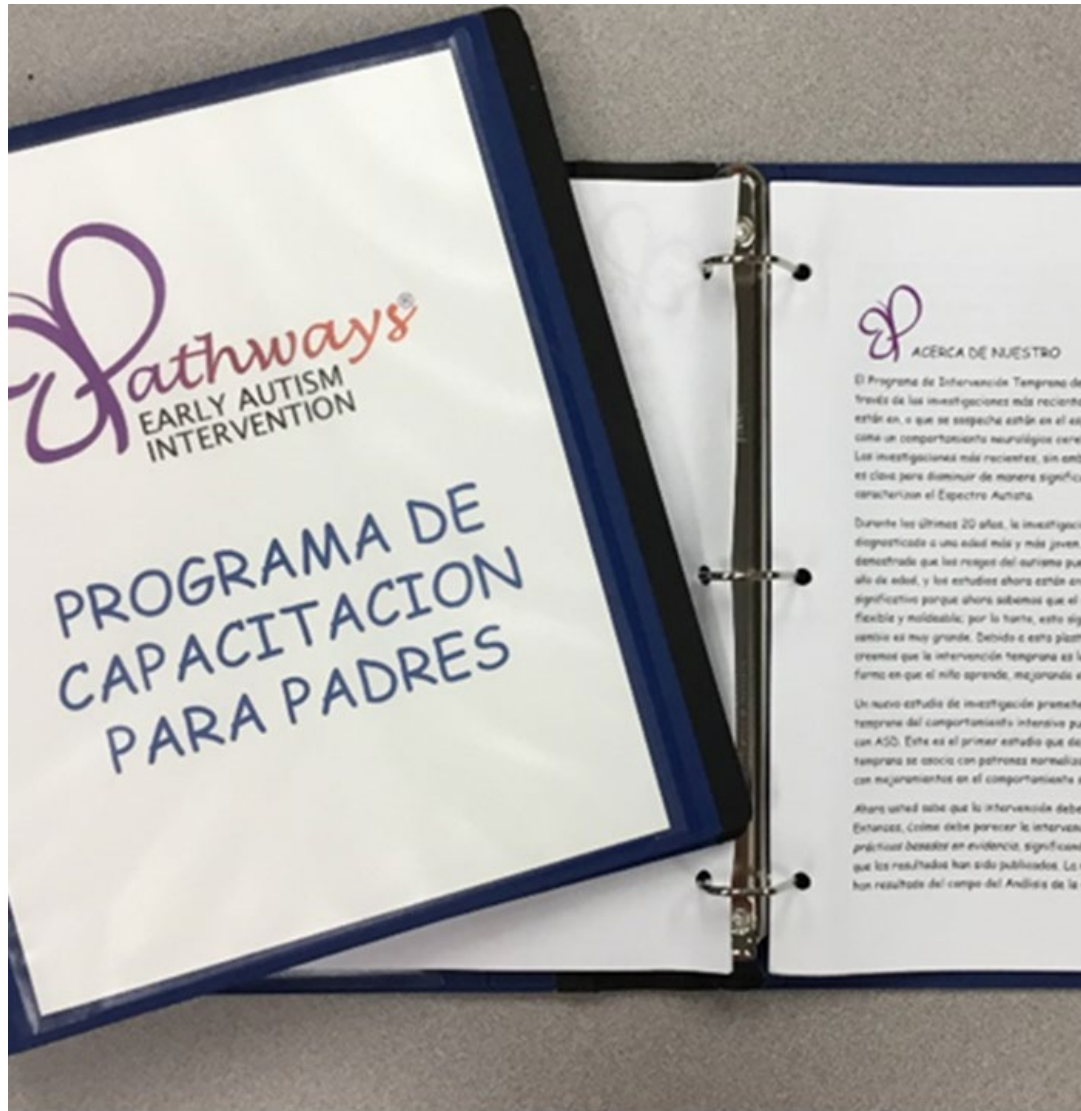
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Naturalistic Development  
Behavioral Intervention

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Focus on Shared Emotion  
skills of mutual gazing &  
social responsiveness





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Manualized intervention in  
English and Spanish

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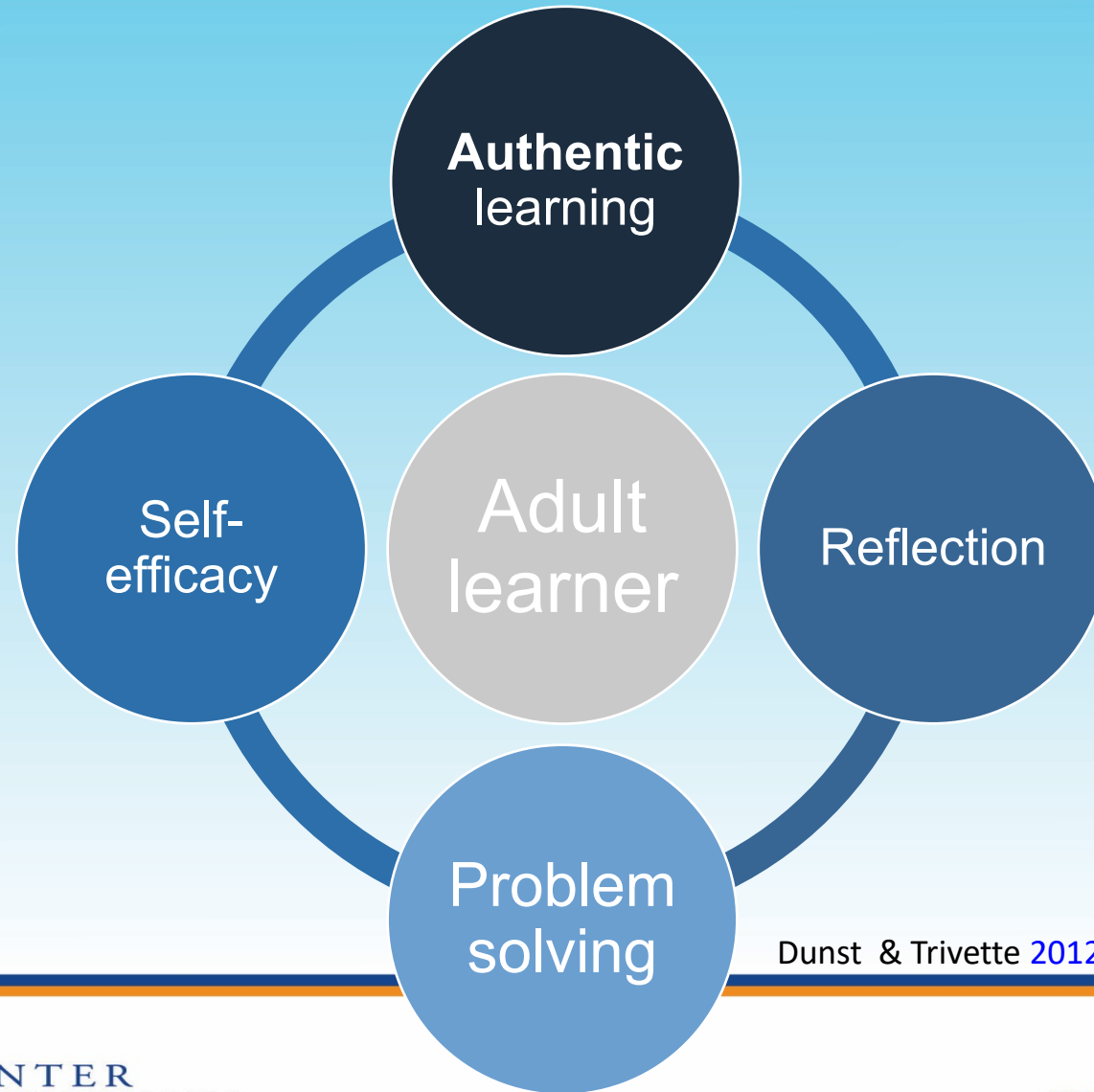
Uses a coaching model  
90 minutes, 1x/wk

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Meets the service delivery  
model of TX IDEA Part C  
Early Childhood Intervention

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# Coaching based on adult learning strategies



Dunst & Trivette [2012](#); Friedman et al. [2012](#); Rush & Shelden [2011](#)



Activity Sequence	Minutes
Information sharing	10
Video observation	5
Reflection & Evaluation	10
Clarification	15-20
New material	10-15
Demonstration	10-15
Parent Practice & Problem Solving	10-15
Activity Plan	10-15

# The Coaching Model

## Problem

Difficult for interventionists to transition from expert to coach

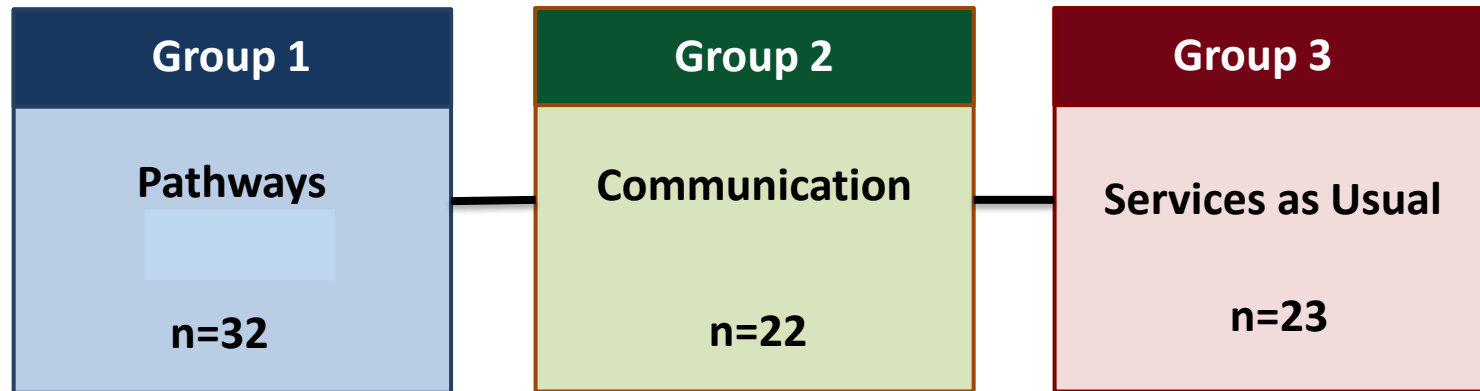
## Solution

Integrate coaching strategies into intervention strategies and activities.

Rollins, et al., (2020)



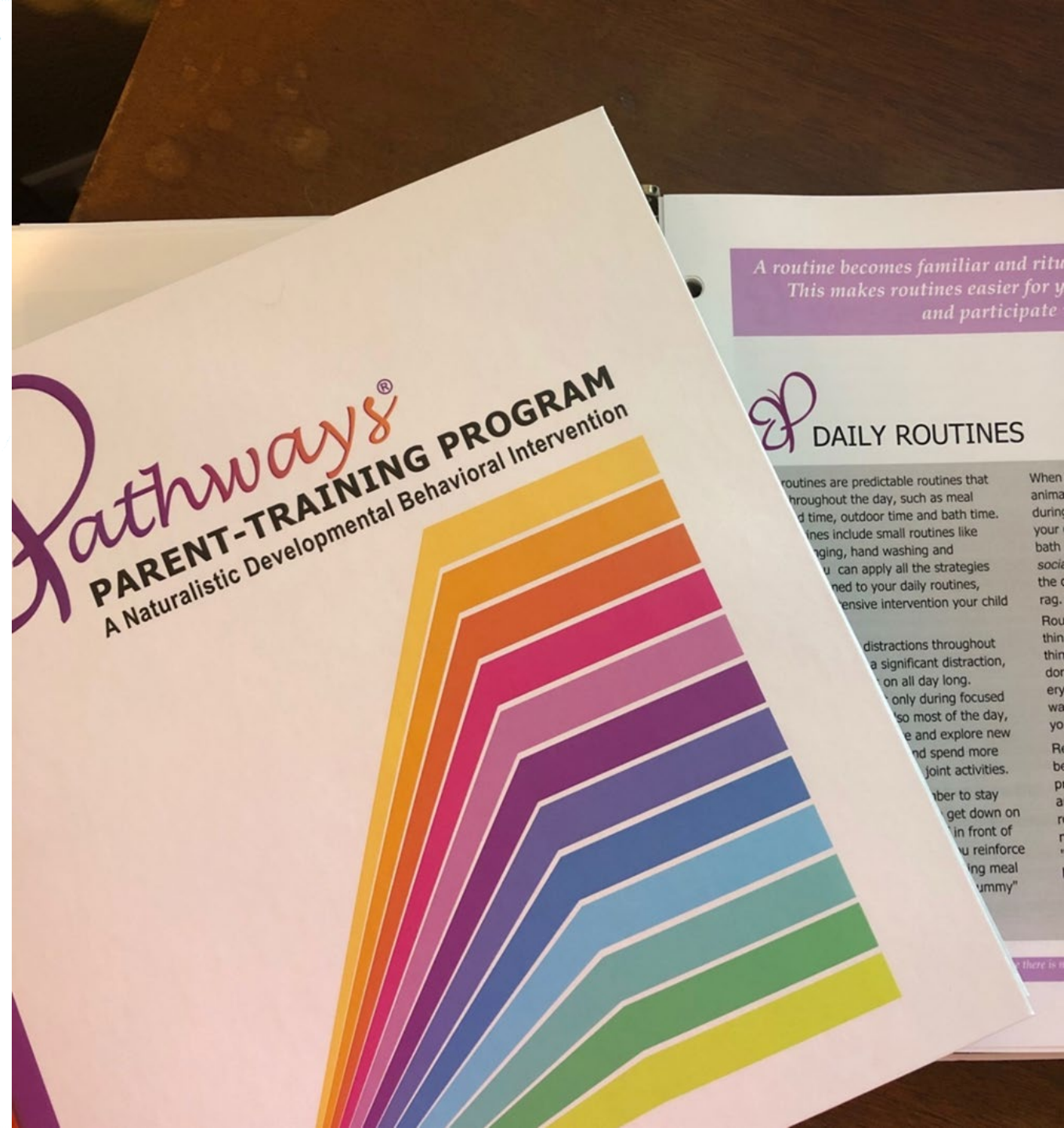
# Pathways 12 week RCT



- (1) Is Pathways an effective ECI model?
- (2) Is mutual gaze an important ingredient to intervention success?

# Units are Cumulative

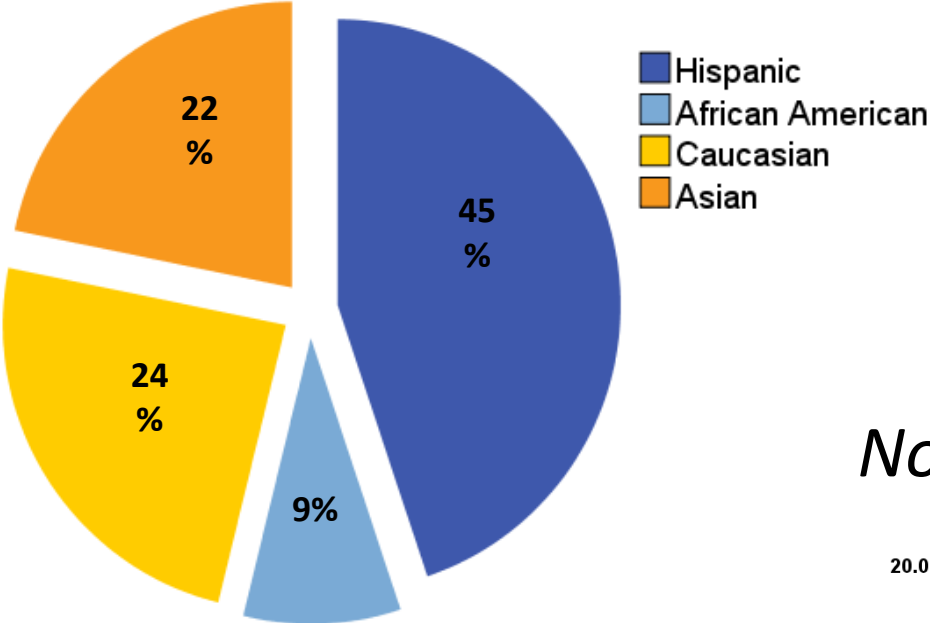
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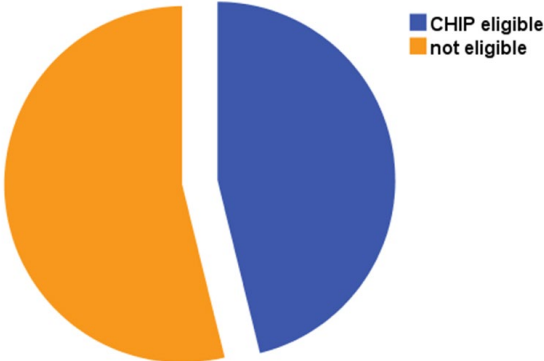
Unit	Pathways	Communication
1	Introduction of learning environments	Introduction of learning environments
2	Face-to-face dyadic interactions & social sensory routines	Face-to-face dyadic interactions & social sensory routines
3	<b>Facilitate mutual gazing</b>	<b>Facilitate communication</b>
4	Use of animation	Use of animation
5	Imitation of the child	Imitation of the child
6	More toys added to the interaction	More toys added to the interaction
7	Facilitation of imitation; modeling and expansion of language	Facilitation of imitation; modeling and expansion of language

# Demographics similar to Texas statewide ECI

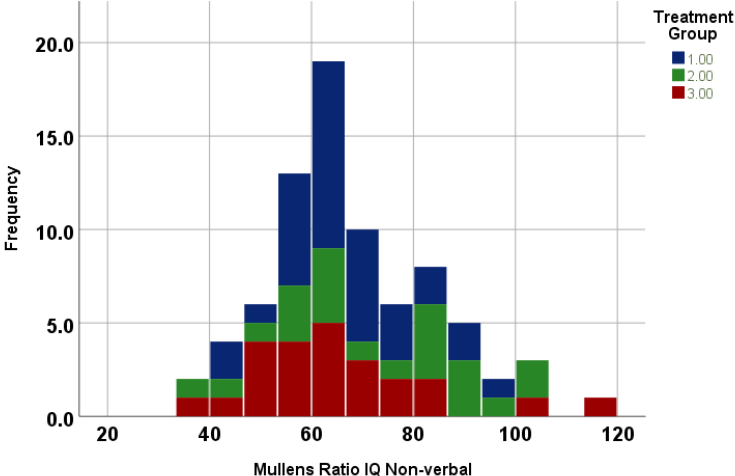
*Ethnicity*



*Chip Eligible*



*Nonverbal IQ (M=65.9, SD=15)*





# Pre and Post Intervention



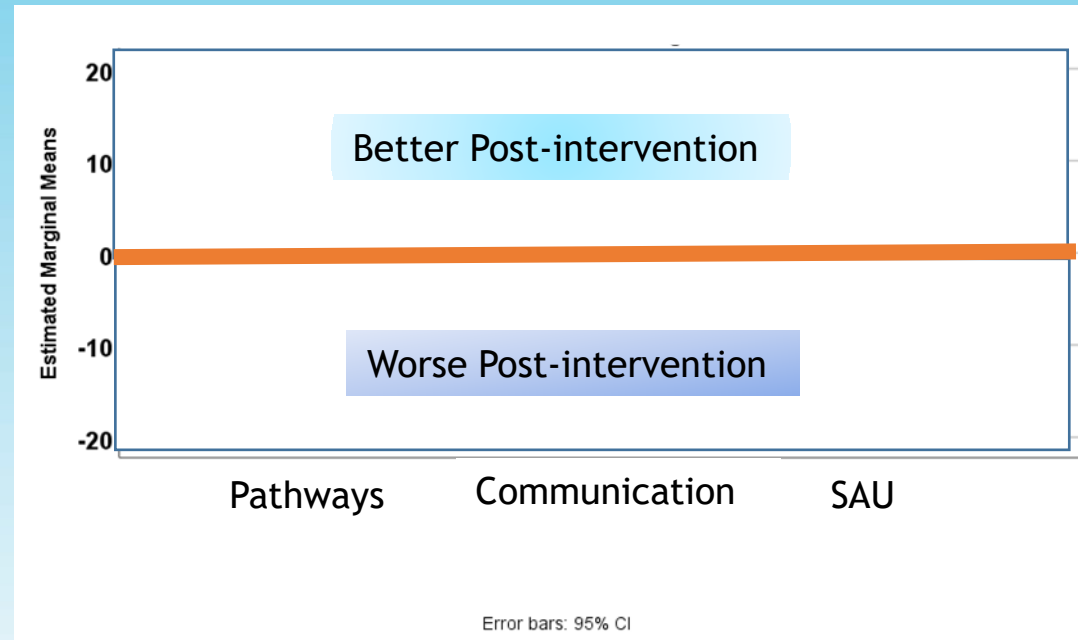
## Parent-child interactions

- Social Eye Gaze
- Vocal-verbal reciprocity
- Intentional communication

## Vineland II, Social Subscale

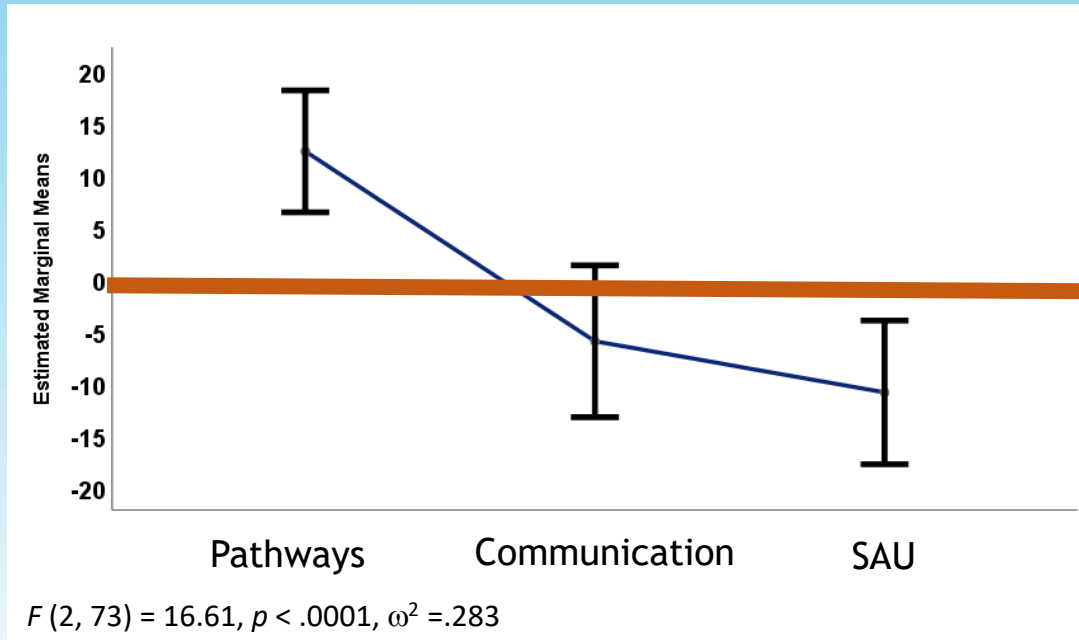


# Residual Change Scores



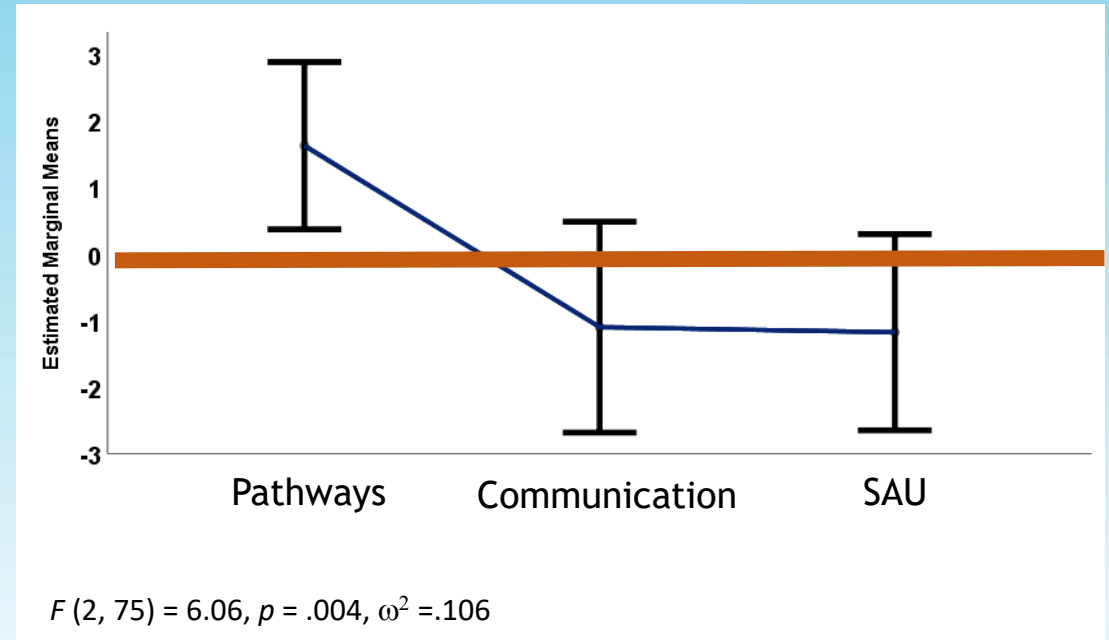
# Social Measures

## Social Eye Gaze



Pathways > Communication = SAU

## Vineland Social (nonverbal IQ)

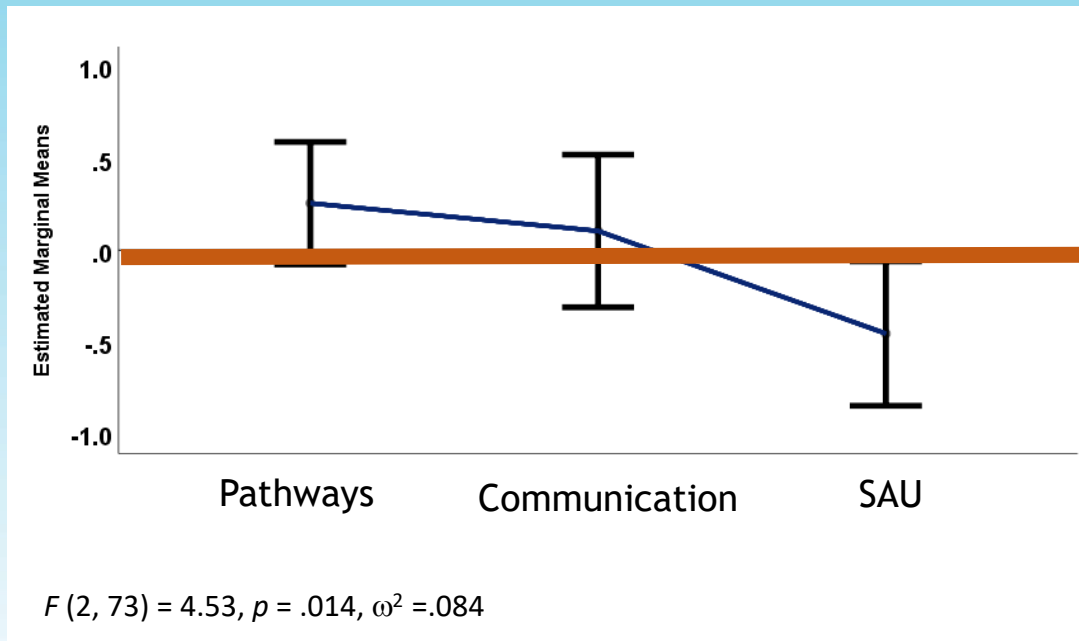


Pathways > Communication = SAU



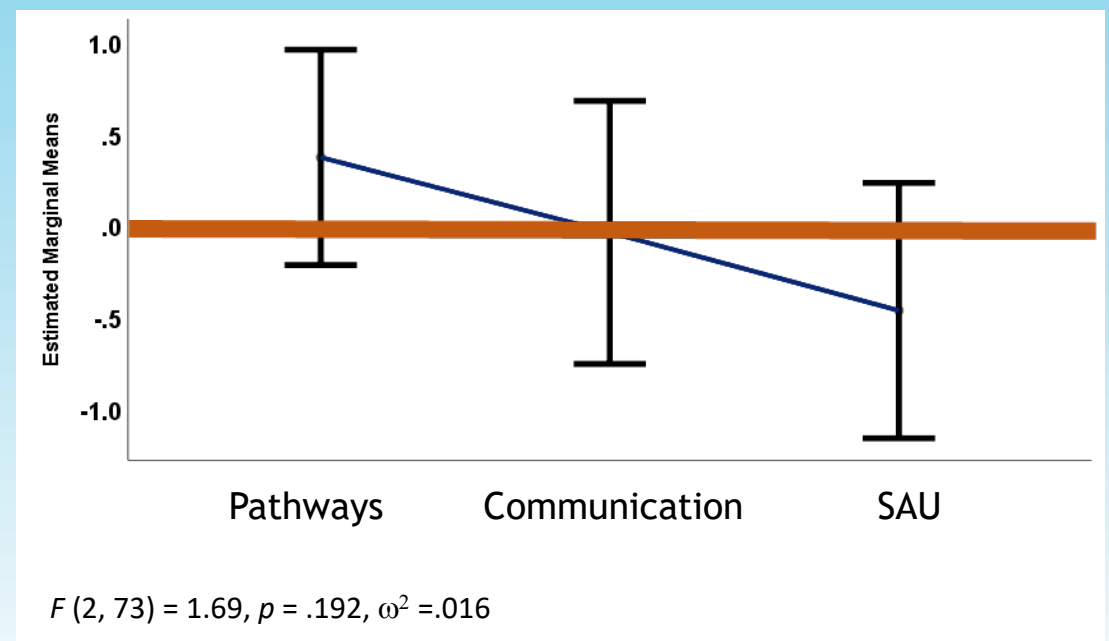
# Social Communication measures (nonverbal IQ)

## Vocal-Verbal Reciprocity



Pathways = Communication > SAU

## Intentional Communication



Pathways = Communication = SAU



# After 12 weeks of Pathways



# Key Findings

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(1) Toddlers with ASD had maximal benefit when parents were coached on early shared emotions skills

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(2) Pathways protocol for mutual gaze appears to be the key ingredient to social development

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(3) Facilitating mutual gaze had cascading effects on communication

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(4) Pathways is an effective early intervention model



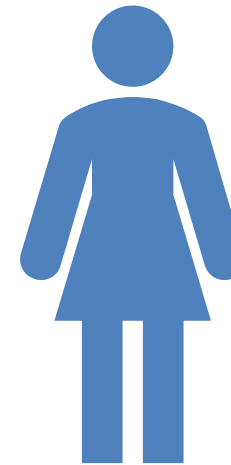
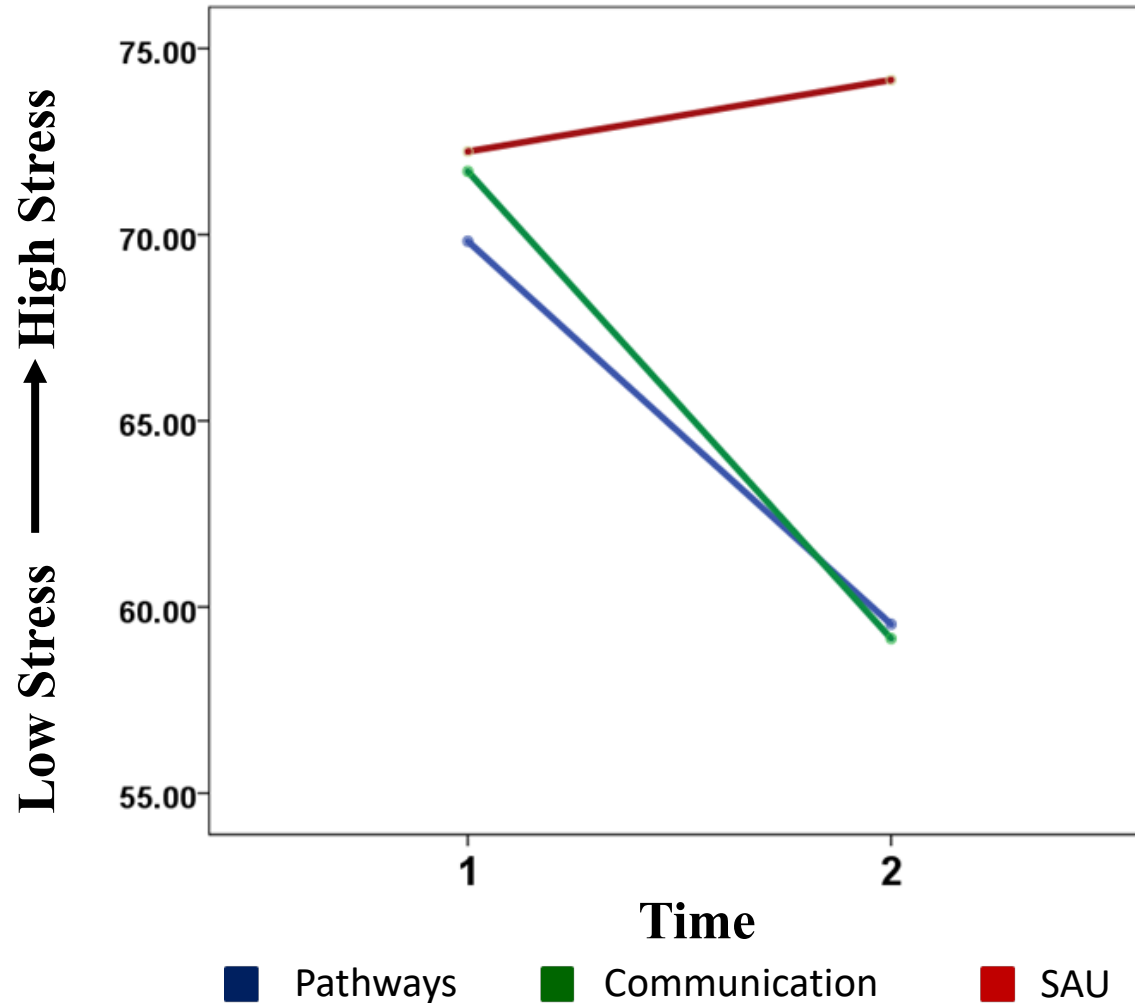
# Parenting Stress Model



Based on Adidin (2012)



# Decrease in Parenting Stress (PSI-4)



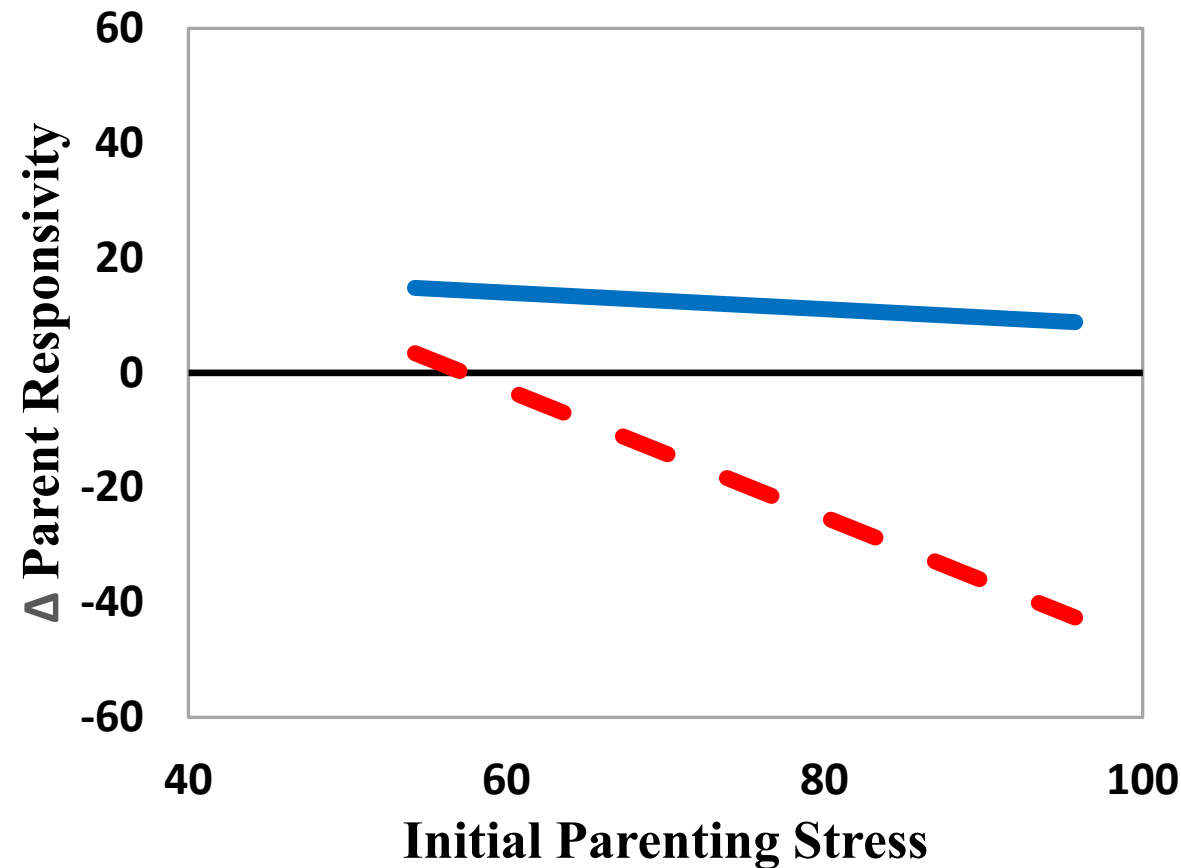
$F(2, 58) = 3.24$   $p = .046$ , partial  $\eta^2 = .10$

Jones, & Rollins (2018)

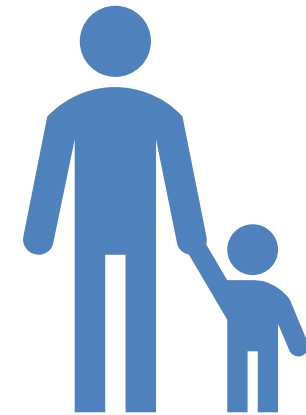


# Initial Parenting Stress & Change in Parent Responsivity (n=56)

Rollins, et al., (2019)



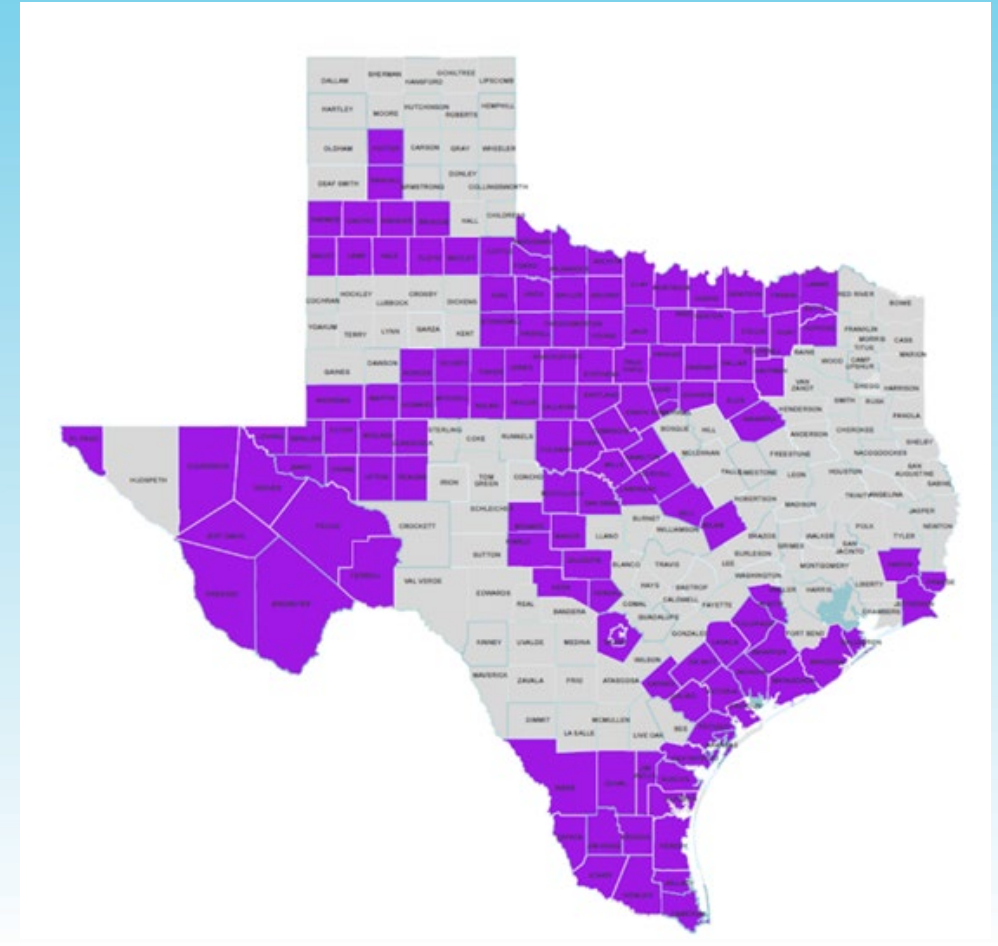
SAU  
Pathways



$R^2 = .43$

# Directions

- To evaluate the efficacy of Pathways in children 3-5 years of age.
- To evaluate the effectiveness of Pathways in Part C, ECI program



**60x30TX**

Texas Higher Education  
Coordinating Board



# Acknowledgements

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- Students for their assistance with coding videos in the social communication lab.
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- The children and families who participated in the study
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  - Delayne , M.S., CCC-SLP
  - Megan Nauta, M.S., CCC-SLP
  - Sara Brantley, MED, BCBA

## Relational health: From research to practice with families of children with autism or hearing differences



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## Goals for today

- To understand the effect of hearing differences on the child
- To describe the effect of hearing differences on the family dynamic, including the parents and siblings
- To apply knowledge of family systems to clinical interactions with children who have hearing differences

## Hearing differences in children

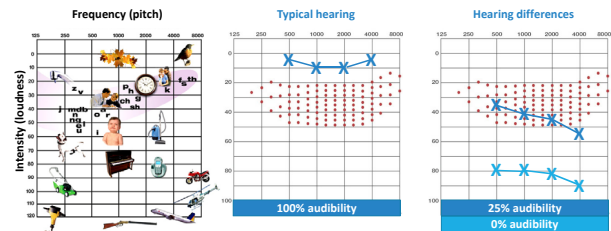


- Sensorineural hearing loss occurs frequently
  - 2-4/1,000 newborn infants
  - 12,000 newborn infants/year
  - 4,000-6,000 infants and toddlers (0-3 years)/year with late-onset HL
  - 16,000-18,000 infants and toddlers with HL per year

\* In the United States

CDC's Hearing Screening and Follow-up Survey, 2009; National Center on Hearing Assessment and Management (NCHAM); White, 2004.

## Effect of hearing differences on audibility



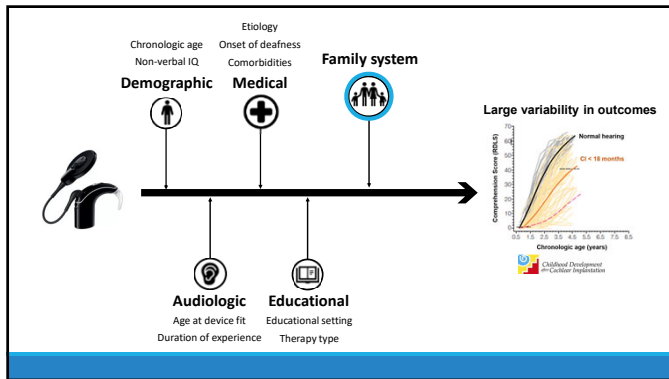
Killion & Mueller, 2010.

## Auditory technology can mitigate effects of hearing loss on audibility.



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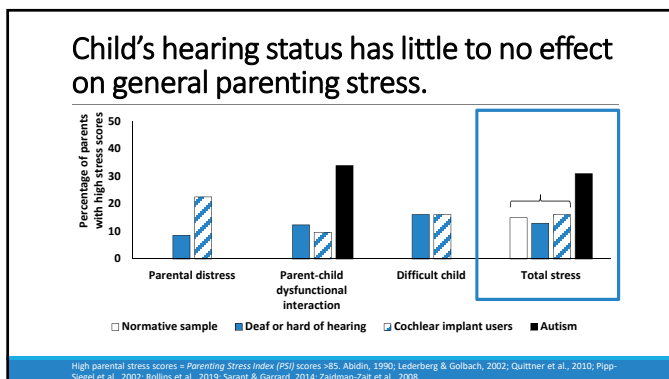
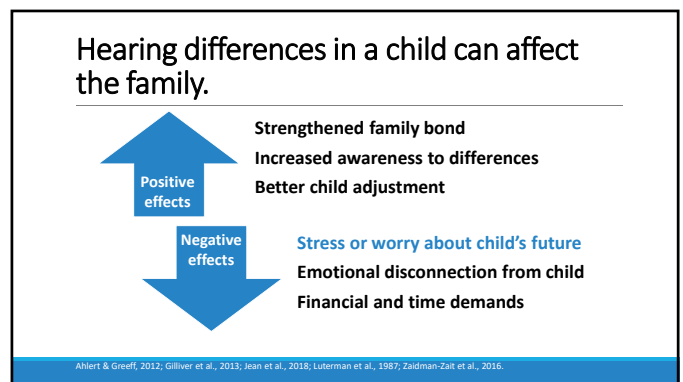
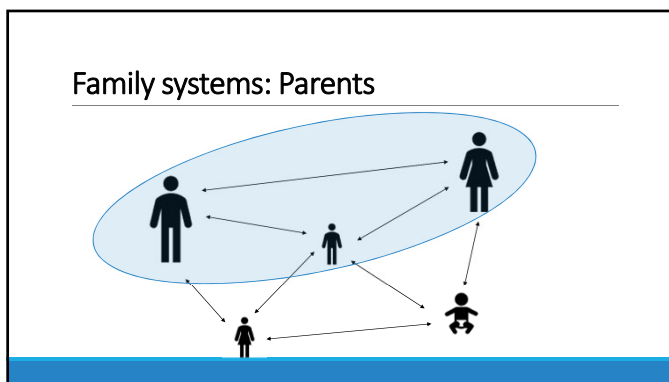




### Family systems theory

Family members function in relation to one another

Change in one family member produces changes in the others



### Does a child's hearing status affect hearing-specific parenting stress?

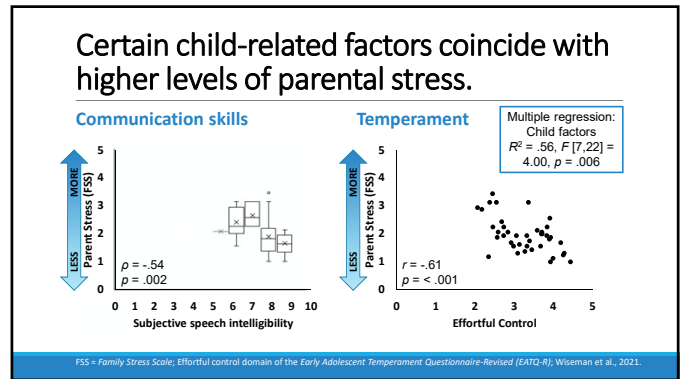
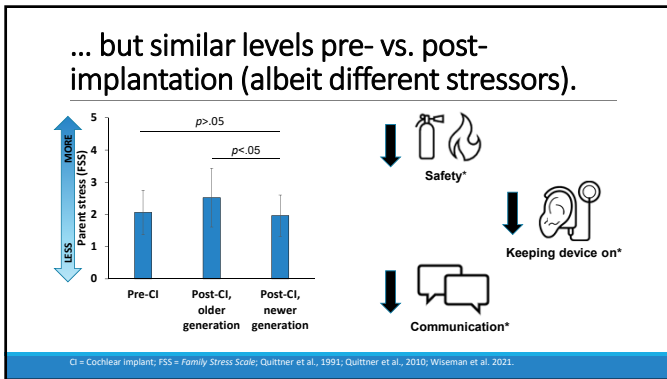
Child characteristics	M (SD)
Chronologic age (years)	11.9 (2.3)
Age at hearing loss identification (years)	1.1 (0.9)
Age at cochlear implantation (years)	2.7 (1.8)
Cochlear implant experience (years)	9.2 (2.5)

**Family Stress Scale (FSS)**  
9 general and 7 HL-specific items

**Child characteristics**  
Chronologic age, gender, maternal education, temperament (EATQ-R)

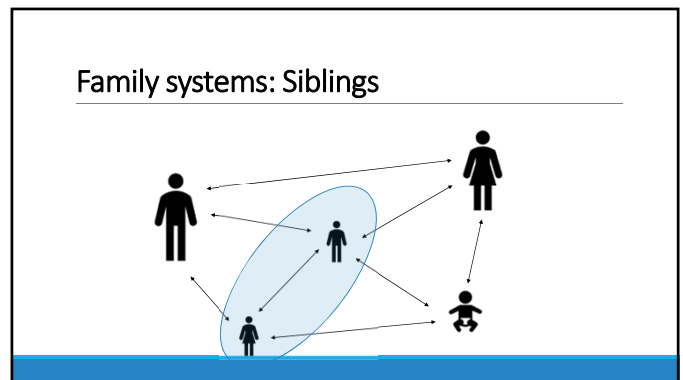
**Cochlear implant-related factors**  
Age at implantation, device experience, communication skills

EATQ-R = Early Adolescent Temperament Questionnaire - Revised; Quittner et al., 1990, 1991; Wiseman et al. 2021.



### Hearing differences may exacerbate factors associated with parental stress.

Allen et al., 1998; Beckman, 1991; Crnic & Low, 2002; Deater-Deckard, 2004; Dyson, 1997; Hastings, 2002; Jennings & Dietz, 2010; Kasak & Marvin, 1984; Luteran, 2003; Mellon, 2012; Neece et al., 2012; Zaidman-Zait, 2008.



### Does a child's hearing status affect the sibling with typical hearing?

Child characteristics	Sibling	CI user
Mean chronologic age (years)	11.6 (2.6)	11.9 (2.9)
Mean age difference (sibling - CI user, years)	0.3 (3.7)	
% female	47%	47%
% older	56%	44%

**Quantitative**

- Sibling perspective of CI users (23 items) – Higher score = more positive
- Effect of hearing loss on sibling (16 items) – Higher score = more affected

**Qualitative**

- Open-ended items about growing up with CI user

CI = cochlear implant; Warner-Czyz et al., 2021.

### Open-ended items revealed some negative feelings by siblings with typical hearing.

*Instead of feeling farther apart from my brother, I feel closer to him.*

*Sometimes I want to hang out with my parents, but if something happens to my brother's CIs, they might not have the time to spend with me.*

*It makes me upset when she's not acting normal with her friends ... it's hard for me to realize how much HL really affects her.*

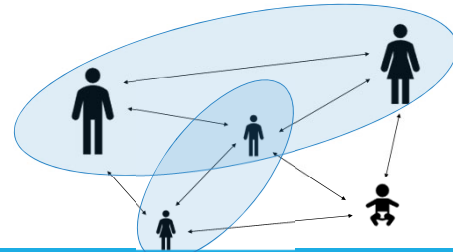
Siblings perspectives relate to the CI users' communication skills.

CI = cochlear implants; HL = hearing loss; Warner-Czyz et al., 2021.

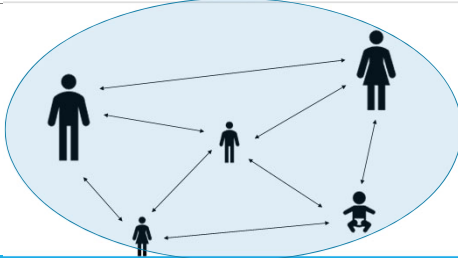
Siblings feel positively, but struggle with aspects of having a cochlear implant user in the family.



## Family systems theory



## Family systems theory



## Clinical implications of this work



### Parental stress

- Active listening
- Cognitive reframing



### Sibling engagement

- Sibling groups/camps
- Dedicated time with parents



### Family focus

- Family support groups/camps
- Inclusion of extended family

## Conclusion

Pediatric hearing differences have direct and indirect effects on the family dynamic.

These effects emerge in early childhood and can have long-lasting influences on all family members.

Clinicians should incorporate ways to engage the whole family to enhance well-being in all members.

## Acknowledgments



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### Recruitment

- Dallas Cochlear Implant Program, Colorado Neurological Institute Cochlear Kids Camp, local professionals

### Data collection, entry, and analysis

- Christine Evans, Hannah Pourchot Neale, Kathryn Wiseman

Participants and their families