



UTILITY OF AGES AND STAGES QUESTIONNAIRE (ASQ) FOR NEURODEVELOPMENTAL SCREENING OF NAVAJO CHILDREN

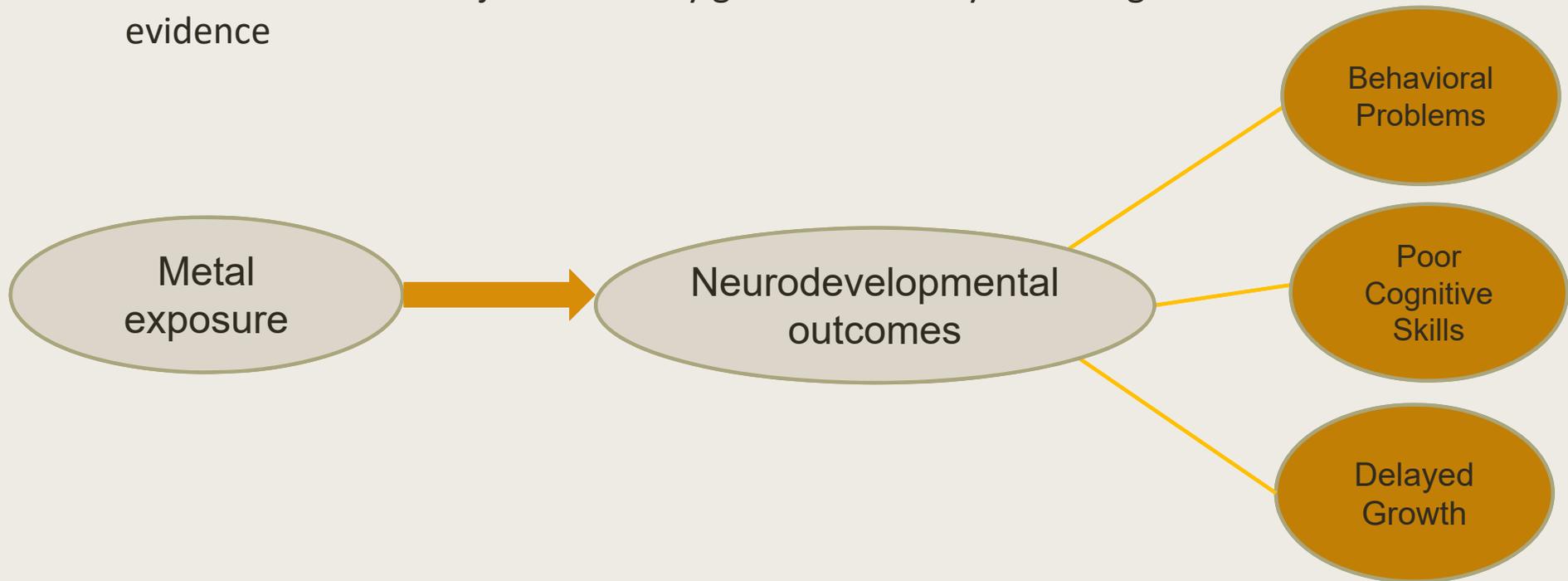
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Background

- Environmental exposure to metal is a concern for children's neurodevelopmental outcomes in the Navajo community given the history of mining in the area and research evidence



Background

- A major goal of the Navajo Birth Cohort Study (NBCS) was to understand the associations between metal exposure and different aspects of children's development among Navajo children
- We first need to understand patterns of neurodevelopmental outcomes among Navajo children, and how they compare to those reported in U.S. population



Background

- Ages & Stages Questionnaires (ASQ) is a screening tool that has been widely-used in the United States and internationally
 - Easy administration
 - Inexpensive
 - More parental involvement
 - Less time-consuming
- ASQ is currently used by multiple federally-funded programs to screen Navajo children for the intervention services
 - The Navajo Division of Education's Growing in Beauty Program
 - The BabyFACE program



Research Aim

- To compare Navajo children's scores on ASQ developmental domains to results obtained from children in a national sample
 - **Communication:** child's expressive and receptive verbal skills (*"When you speak to your baby, does she make sounds back to you?"*)
 - **Gross Motor:** Use of large muscles (*"When your baby is on her back does she kick her legs?"*)
 - **Fine Motor:** Child's hand and finger coordination (*"Does your baby pick up a small toy with only one hand?"*)
 - **Personal and Social:** Child's self-help and social interaction skills (*"Does your baby feed himself a cracker or a cookie?"*)
 - **Problem-solving:** (*"Does your baby play by banging a toy up and down on the floor or table?"*)



Methods

Participants

- Children ($N= 512$) were subsample of NBCS
- NBCS included pregnant women
 - Between the ages of 14 and 44 (more than 90% of fathers were Navajo)
 - Resided in Navajo community for at least five years
 - Were willing to deliver in one of the participating clinics and to have their child followed up for 12 months

ASQ Administration for Navajo Birth Cohort Study		
Age Category (Months)	ASQs Administered (N)	% Female Babies
1-3 Months	304	51.3%
5-7 Months	303	52.8%
9-11 Months	246	49.6%
11-13 Months	264	50.0%

Method

- Assessments were conducted during home visits where field research staffs administered ASQ

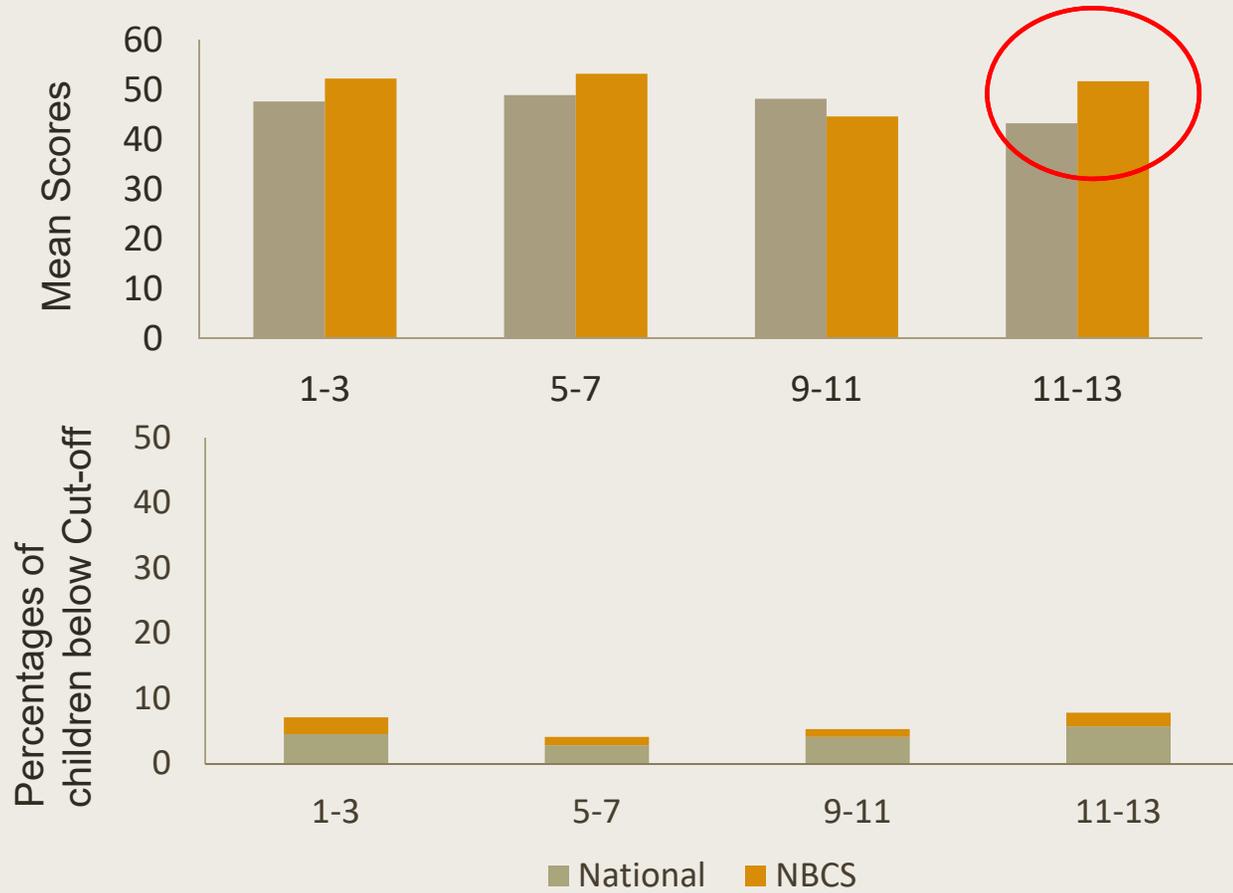
National Sample

- Racial distribution of the **national** sample was as follows: Asian (3.6%), Caucasian (66.4%), Native American (1%), Hawaiian (.1%), Black (11.6%), Hispanic (10.6%), Pacific islander (.3%), Other (1.1%), and Mixed (4.5%)
- Only 3.5% of NBCS sample reported to have an annual family income over \$40,000 per year in contrast with 57.1% of participants in the ***national*** sample

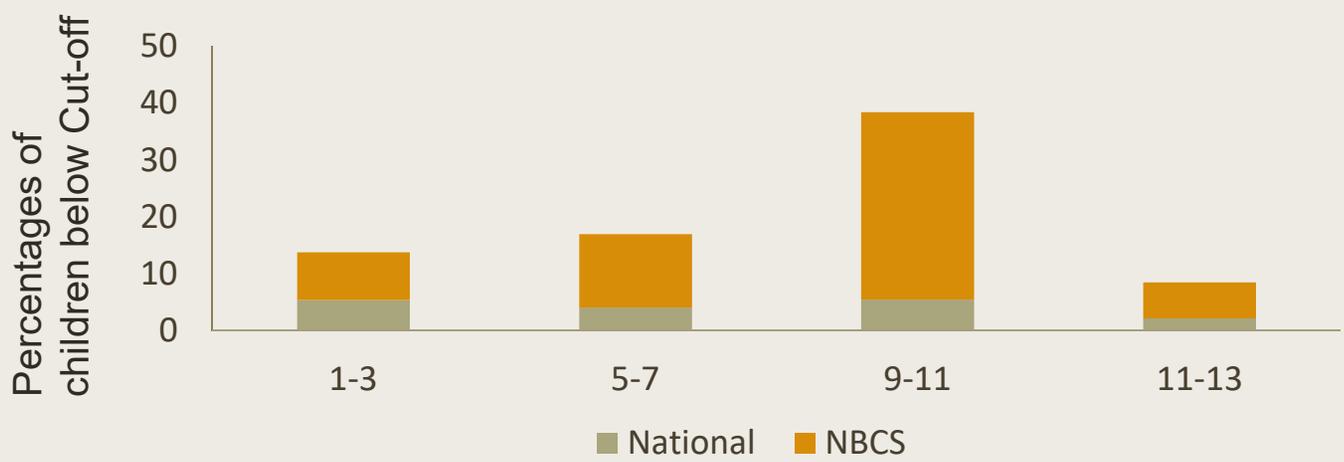
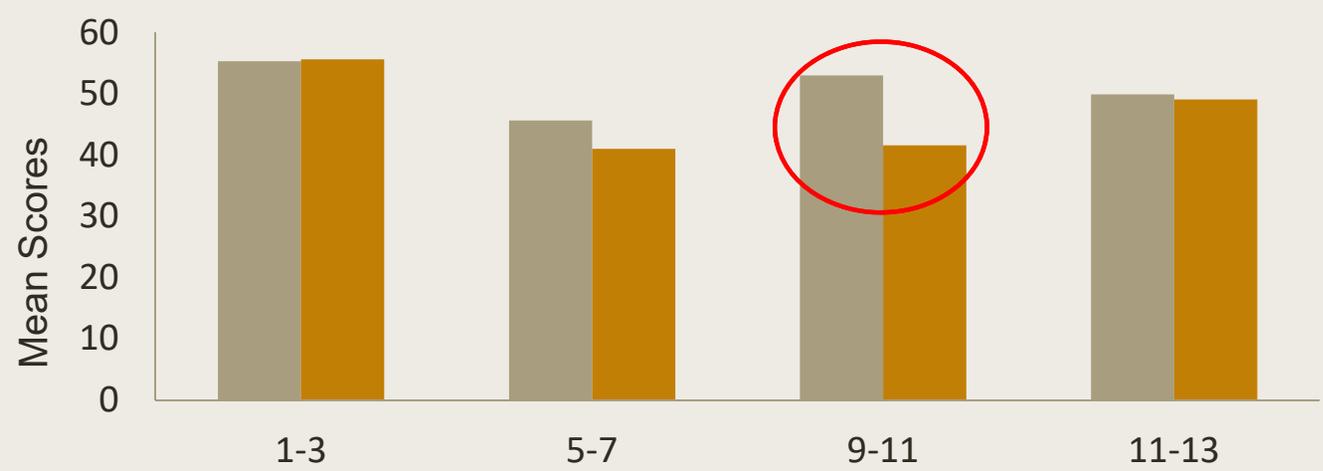
Results

- *T*-tests were conducted to test mean differences between children in the NBCS (*N*s = 308, 266, 248, and 270 at 1-3, 5-7, 9-11 and 11-13 months, respectively) and national samples (*N*s = 352, 633, 899, and 2088 at 1-3, 5-7, 9-11 and 11-13 months, respectively) in terms of mean scores on five developmental domains
- Only mean differences with medium to large effect sizes (Cohen's *d* greater than .50) are indicated are shown on the graphs
- Percentages of children who fell below cut-off scores, established using data for the national sample (*2SD below the mean scores in national sample*), were calculated

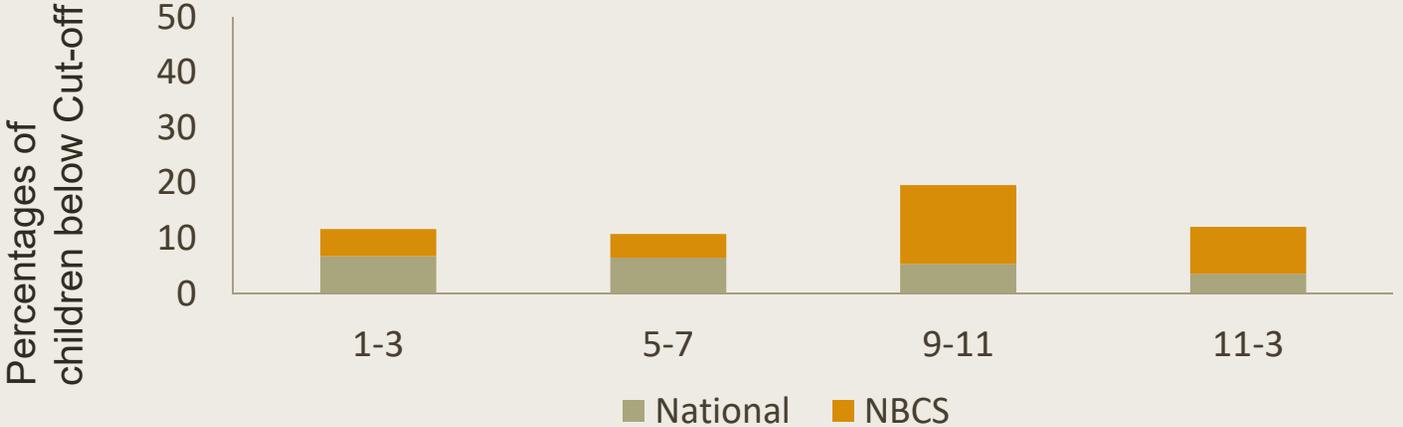
Communication



Gross Motor



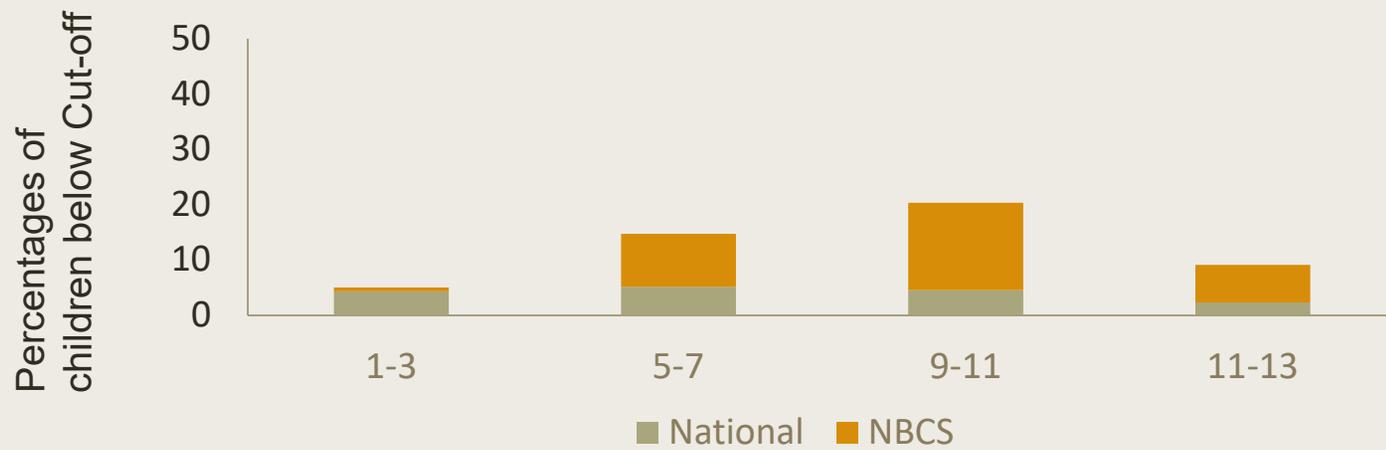
Fine Motor



Problem-Solving



Personal and social



Conclusion

- NBCS children's scores on different domains, for the most part, resembled those observed in the national sample
- Differences between children from NBCS and national samples were more pronounced between 9-11 months, particularly in motor skills
 - Cultural practices
- At 12-month, children in NBCS sample had higher mean scores on communication compared to children in national sample, which is inconsistent with previous studies

Future Directions

- Future data collection can help us examine children's developmental trajectories on different domains and to see whether these similarities exist beyond one year
 - If not true, when do differences emerge
- We are continuing to collect data that will allow us to connect children's developmental outcomes with factors such as environmental exposures and nutrition

Future Directions

- Comprehensive developmental assessments help us with our long-term goals:
 - To establish population-specific norms, which is particularly important given that ASQ is currently used by several programs
 - To improve referral at an earlier age

Thank you!

Conclusion

3. When you stand your baby next to furniture or the crib rail, does she hold on without leaning her chest against the furniture for support?



4. While holding onto furniture, does your baby bend down and pick up a toy from the floor and then return to a standing position?



5. While holding onto furniture, does your baby lower himself with control (without falling or flopping down)?
6. Does your baby walk beside furniture while holding on with only one hand?