TMW: A Public Health Approach to Early Learning

Dana Suskind, MD
Overview

• The case for a parent-centered public health approach to early learning
  • Landscape of our young children
  • Background science
    • Early disparities
    • Parents: An untapped resource
  • TMW Overview
  • Parent-Centered Public Health Model: TMW & our learnings
  • TMW community-wide demonstration project
Hart & Risley
Variation among families regarding the early language environment provided to infants results in huge and consequential differences in “learning opportunities” over the first years of life.

(Hart and Risley, 1995)
Variation among families regarding the early language environment provided to infants results in huge and consequential differences in “learning opportunities” over the first years of life. (Hart and Risley, 1995)
Four Million Word Gap
Power of Parent Talk & Interaction

(Hart and Risley, 1995)
Early Language Environments

• Critical for building children’s ability to communicate and learn
• Parent talk fosters children’s language, cognitive and executive function skills such as:
  • Language
  • Literacy
  • Math and spatial reasoning
  • Executive function and self-regulation
  • Socio-emotional
  • Attachment

(Connell & Prinz, 2002; Forget-Dubois et al., 2009; Walker, Greenwood, Hart and Carta, 1994)
It All Comes Down to the Brain
Impacts of Poverty on Brain Structure: Key Areas of Academic Interest

- The areas most impacted by poverty happen to be those that are most critical to educational attainment.

- Language: Left Hemisphere Language Cortex

- Executive Functioning: Prefrontal Cortex
Fig. 6. Mediation model showing the effect of conversational turns on language assessment scores as mediated by activation in the left inferior frontal gyrus (IFG), shaded in yellow. Activation significantly mediated the relation between the number of conversational turns children experience and their language scores. Solid arrows represent direct paths, whereas the dotted arrow represents the indirect (mediated) path. Asterisks indicate significant paths (*$p < .01$, **$p < .001$).

(Romeo et. al, 2018)
Neural Correlates of SES in the Developing Human Brain

Developmental Science Volume 15, Issue 4, pages 516-527, 29 MAR 2012
DOI: 10.1111/j.1467-7687.2012.01147.x
Technology’s Impact on Parent-Child Interaction: We’re All at Risk

Inequalities at the Starting Gate

Differences in cognitive skills on the first day of kindergarten

Reading skills by socioeconomic status

Percentage of Children who are Poor or Low-Income, by Race and Hispanic Origin: 2015

*Federal poverty level.
Note: Estimates reflect the new OMB race definitions, and include only those who are identified with a single race. Hispanics may be of any race.
Source: U.S. Census Bureau. CPS Table Creator (online tool), available at: [http://www.census.gov/cps/data/cpstablecreator.html](http://www.census.gov/cps/data/cpstablecreator.html)

Differences in foundational brain development start early and accrue over time

0-1 YEARS
As early as nine months old, infants born into poverty score lower on cognitive development measures than do their more affluent peers

1-3 YEARS
This disparity triples by the age of two, and grows significantly through a child’s early years

3-5 YEARS
Each year ~1M low-income students enter kindergarten lacking key competencies to be ready to learn, with many preschool interventions occurring too late

ADOLESCENCE AND ADULTHOOD
This results in a cascade of consequences for cognitive and social-emotional development, academic attainment, occupational status, and later-life health and social well-being

"Because the brain is the organ from which all cognition and emotion originates, healthy human brain development represents the foundation of our civilization. Accordingly, there is perhaps nothing more important that a society must do than foster and protect the brain development of our children."

Joan L. Luby, MD
Early Language Exposure: An Overlooked SDOH

Social Determinant of Health

“the conditions in the environments in which people are born, live, learn, work, play, worship, and age that affect a wide range of health, functioning and quality-of-life outcomes, and risks.”
Early Language Exposure: An Overlooked SDOH

• Translational research program

• Aspires to a population-level shift in knowledge and beliefs

• Focuses on prevention rather than remediation

• Develops and tests parent- and provider-directed interventions

• Targets birth to 3 years of age
What is a Public Health Approach?

- Population level health & Impacts at Scale
- Focuses on prevention, rather than remediation
- Embeds science-based practices in multiple touch points in existing early learning and public health systems
- Employs a data-driven methodology
- Optimizes feedback-driven solutions at community and population levels
Parent Beliefs

Basic care, such as feeding, changing, and bathing, is the only thing an infant really needs for healthy development

(TMW-WB Study, 2018)
Parent Beliefs

*Leaving the TV on in the background is a great way to give 0 to 2 year olds extra chances to learn words*

True 59%

Not True 41%

(TMW-WB Study, 2018)
Parent Beliefs

*Infants learn little about language in the first six months of their life*

(True 66%  Not True 34%)
What Pediatricians Talk about at Well-Child Visits

At 1-month Visit

- Your baby’s weight: 63% English (n=235), 77% Spanish (n=200)
- Feeding: 74% English (n=235), 84% Spanish (n=200)
- How babies learn: 12% English (n=235), 11% Spanish (n=200)
- Learning to talk: 9% English (n=235), 8% Spanish (n=200)
- Brain growth: 23% English (n=235), 24% Spanish (n=200)

At 6-month Visit

- Your baby’s weight: 58% English (n=249), 61% Spanish (n=219)
- Feeding: 68% English (n=249), 84% Spanish (n=219)
- How babies learn: 24% English (n=249), 26% Spanish (n=219)
- Learning to talk: 24% English (n=249), 29% Spanish (n=219)
- Brain growth: 38% English (n=249), 23% Spanish (n=219)

(TMW-WB Study, 2018)
TMW’s Model for a *Parent*-Centered Public Health Approach to Early Learning

**Community Partnership**
- Parent and Community Informed Programming
- Community Engagement
- Public Awareness

**Maternity Wards**
- TMW-Newborn

**Pediatric Clinics**
- TMW-Well Baby
- TMW-Pediatrics

**Home Based**
- TMW-Home Visiting
- Project ASPIRE

**Community Based Organizations**
- TMW-Let’s Talk!
- TMW-Let’s Talk Dads!

**Formal Early Learning/Childcare Centers**
- TMW-Early Childhood Educator
- CogX Parent Academy

**TMW Ambassadors**
- TMW-Spread the Words
Overlaying onto Public Health Infrastructure
Growth-Mindset Parenting
the 3Ts

TUNE IN

TALK MORE

TAKE TURNS
Behavioral Nudges

Quantitative Linguistic Feedback

Goal Setting

Video Modeling

Personalized Text Messages

Remember to follow your child’s lead as you read him a bedtime story tonight.
Science as the Basis for Real Social Change

Translate the research base on foundational brain development into actionable interventions

Test and iterate interventions, with adaptations for differing contexts and delivery sites (e.g. home visiting vs group classes)

Evaluate results of interventions with goal of identifying areas for continuous improvement
TMW-Newborn

- 10-minute, bilingual video with multimedia content
- Administered postpartum, mapped onto the UNHS
- RCT with 500 families
- Aims to impact parents’ knowledge and beliefs about child language development
TMW-Well Baby

- Series of 4, 10-minute videos
- Bilingual, multimedia content
- Mapped onto Well Child Checks at 1-, 2-, 4-, and 6-month pediatric visits
- Designed to reach parents from the start
- RCT with 500 families
**TMW-Home Visiting: English**

- Series of 12, 60 minute modules
- Delivered in the home biweekly for 6 months
- Integrates behavioral nudges, video modeling, and multimedia content
- RCT with 200 families

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**Day 11: Numbers**

Talking about **shapes** helps build your child’s math foundation.

There are shapes everywhere!

*Tune In* to what your child is focused on and *Talk More* and *Take Turns* about its shape.
# Home Visiting Curriculum Iteration

<table>
<thead>
<tr>
<th>Modules</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Introduction</td>
<td>Brain development, emphasis of parent as key player</td>
</tr>
<tr>
<td>2. Talk More</td>
<td>Increasing parent talk</td>
</tr>
<tr>
<td>3. Tune In</td>
<td>Joint attention, responsiveness, child-directed speech</td>
</tr>
<tr>
<td>4. Take Turns</td>
<td>Conversational turn taking</td>
</tr>
<tr>
<td>5. Spread the Words</td>
<td>Spreading key messaging through social networks</td>
</tr>
<tr>
<td>6. Behavior Stoplight</td>
<td>Supporting self-regulation (executive functioning)</td>
</tr>
<tr>
<td>7. Directives</td>
<td>Avoiding directives and supporting critical thinking skills</td>
</tr>
<tr>
<td>8. Encouragements</td>
<td>Person vs. process-based praise</td>
</tr>
<tr>
<td>10. Storytelling</td>
<td>Building vocabulary and pre-literacy skills</td>
</tr>
<tr>
<td>11. Math Talk</td>
<td>Using language to develop math and spatial reasoning skills</td>
</tr>
<tr>
<td>12. Technology Diet</td>
<td>Limiting media exposure to foster more talk and interaction</td>
</tr>
</tbody>
</table>
Behavior Change Strategies

Intervention Approach

- Knowledge
- Beliefs
- Behaviors

Behavior Change Strategies
LEN A – L anguage E N vironment A nalysis

Digital audio-recording devices and a specialized processing software

• Adult word count
• Child vocalization count
• Conversational turn count
Quantitative Linguistic Feedback

Average turns per hour

- Your starting point
- Your short-term goal
- Your long-term goal

Take Turns

<table>
<thead>
<tr>
<th>Date</th>
<th>Average Turns</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 12</td>
<td>39</td>
</tr>
<tr>
<td>March 20</td>
<td>39</td>
</tr>
<tr>
<td>April 1</td>
<td>25</td>
</tr>
<tr>
<td>April 8</td>
<td>52</td>
</tr>
<tr>
<td>April 15</td>
<td>58</td>
</tr>
<tr>
<td>April 24</td>
<td>46</td>
</tr>
</tbody>
</table>
TMW-Home Visiting: Spanish

- A cultural and linguistic adaptation of the TMW-HV program
- Addresses concerns vital to mono- and multilingual Spanish-speaking families
- RCT with 90 families
Science as the Basis for Real Social Change

Translate the research base on foundational brain development into actionable interventions

Test and iterate interventions, with adaptations for differing contexts and delivery sites (e.g. home visiting vs group classes)

Evaluate results of interventions with goal of identifying areas for continuous improvement
SPEAK: Our Public Health Indicator

“What gets measured, gets done”

(Suskind et. al, 2017)
<table>
<thead>
<tr>
<th>Subdomains</th>
<th>Sample Item, Response Scale, and Correct Response</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Early Exposure</strong></td>
<td>When do you think a child is ready to be exposed to numbers and counting?</td>
</tr>
<tr>
<td></td>
<td>• As an infant (0 to 6 months)</td>
</tr>
<tr>
<td></td>
<td>○ As a toddler (1 to 3 years)</td>
</tr>
<tr>
<td></td>
<td>○ In preschool (3 to 5 years)</td>
</tr>
<tr>
<td></td>
<td>○ In Kindergarten (5 to 6 years)</td>
</tr>
<tr>
<td></td>
<td>○ In elementary school (6 years and up)</td>
</tr>
<tr>
<td><strong>Bilingualism</strong></td>
<td>When toddlers learn multiple languages at home, it will slow down their learning in all other subjects at school.</td>
</tr>
<tr>
<td></td>
<td>○ Definitely True</td>
</tr>
<tr>
<td></td>
<td>○ Probably True</td>
</tr>
<tr>
<td></td>
<td>○ Probably Not True</td>
</tr>
<tr>
<td></td>
<td>• Definitely Not True</td>
</tr>
<tr>
<td><strong>Media Use for Child Learning</strong></td>
<td>Children 0 to 2 years old can learn just as many words from educational TV as they can from their parents.</td>
</tr>
<tr>
<td></td>
<td>○ Definitely True</td>
</tr>
<tr>
<td></td>
<td>○ Probably True</td>
</tr>
<tr>
<td></td>
<td>○ Probably Not True</td>
</tr>
<tr>
<td></td>
<td>• Definitely Not True</td>
</tr>
<tr>
<td><strong>Nature vs. Nurture</strong></td>
<td>How smart a baby will become depends mostly on genetics.</td>
</tr>
<tr>
<td></td>
<td>○ Definitely True</td>
</tr>
<tr>
<td></td>
<td>○ Probably True</td>
</tr>
<tr>
<td></td>
<td>○ Probably Not True</td>
</tr>
<tr>
<td></td>
<td>• Definitely Not True</td>
</tr>
<tr>
<td><strong>Sensitivity and Responsiveness</strong></td>
<td>When infants babble, parents should respond as if the infant is saying real words.</td>
</tr>
<tr>
<td></td>
<td>• Definitely True</td>
</tr>
<tr>
<td></td>
<td>○ Probably True</td>
</tr>
<tr>
<td></td>
<td>○ Probably Not True</td>
</tr>
<tr>
<td></td>
<td>• Definitely Not True</td>
</tr>
<tr>
<td><strong>Talking and Reading</strong></td>
<td>Answering only if a toddler uses words instead of just pointing better helps the toddler learn how to talk.</td>
</tr>
<tr>
<td></td>
<td>• Definitely Not True</td>
</tr>
<tr>
<td></td>
<td>○ Definitely True</td>
</tr>
<tr>
<td></td>
<td>○ Probably True</td>
</tr>
<tr>
<td></td>
<td>○ Probably Not True</td>
</tr>
</tbody>
</table>
TMW-Well Baby Initiative

Bilingual, video-based intervention built into pediatric visit at 1, 2, 4, & 6 months

Integrates into existing infrastructure to reach parents from the start

RCT with 450 families
### Participant Demographics

<table>
<thead>
<tr>
<th>Group</th>
<th>English TMW-Well Baby (N = 125)</th>
<th>English Control (N = 125)</th>
<th>Spanish TMW-Well Baby (N = 112)</th>
<th>Spanish Control (N = 107)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (M, SD)</td>
<td>25.35 yr (5.39)</td>
<td>24.46 yr (4.78)</td>
<td>28.89 yr (6.01)</td>
<td>27.57 yr (6.12)</td>
</tr>
<tr>
<td>Non-Hispanic, African American</td>
<td>103 (82%)</td>
<td>99 (79%)</td>
<td>2 (2%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Hispanic, any race</td>
<td>15 (12%)</td>
<td>21 (17%)</td>
<td>109 (97%)</td>
<td>104 (97%)</td>
</tr>
<tr>
<td>Married</td>
<td>9 (7%)</td>
<td>10 (8%)</td>
<td>43 (38%)</td>
<td>45 (42%)</td>
</tr>
<tr>
<td>Living with partner</td>
<td>18 (14%)</td>
<td>27 (22%)</td>
<td>36 (32%)</td>
<td>37 (35%)</td>
</tr>
<tr>
<td>Single</td>
<td>94 (75%)</td>
<td>86 (69%)</td>
<td>26 (23%)</td>
<td>24 (22%)</td>
</tr>
<tr>
<td>HS/GED or some college</td>
<td>92 (74%)</td>
<td>79 (63%)</td>
<td>60 (54%)</td>
<td>55 (51%)</td>
</tr>
<tr>
<td>Employed</td>
<td>36 (29%)</td>
<td>49 (39%)</td>
<td>31 (28%)</td>
<td>28 (26%)</td>
</tr>
<tr>
<td>Family Size (M, SD)</td>
<td>4.30 (1.50)</td>
<td>4.13 (1.50)</td>
<td>4.50 (1.42)</td>
<td>4.88 (1.34)</td>
</tr>
<tr>
<td>Link/WIC</td>
<td>108 (86%)</td>
<td>107 (86%)</td>
<td>85 (76%)</td>
<td>78 (73%)</td>
</tr>
</tbody>
</table>
Adverse Life Events in the First 6 Months

- 26% English-speaking and 27% Spanish-speaking experienced at least 1 event
  - Have you or a family member been the victim of a violent crime?
  - Has your child been a witness to a violent crime, domestic violence or abuse?
  - Have you or a family member had significant depression, mental illness, or attempted suicide?
  - Have you or a family member been jailed or in prison?
  - Has your child lived with someone who had a problem with alcohol or used drugs?
Support for Childcare

*Who will care for your child the majority of the time?*

<table>
<thead>
<tr>
<th></th>
<th>1-Month WC Visit</th>
<th>6-Month WC Visit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>English</td>
<td>Spanish</td>
</tr>
<tr>
<td>Myself</td>
<td>199</td>
<td>94.3%</td>
</tr>
<tr>
<td>Child’s Other</td>
<td>8</td>
<td>3.8%</td>
</tr>
<tr>
<td>Parent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Family Member</td>
<td>2</td>
<td>0.9%</td>
</tr>
<tr>
<td>Home Daycare/</td>
<td>2</td>
<td>0.9%</td>
</tr>
<tr>
<td>Daycare Center</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Sample: Low-SES Caregivers

<table>
<thead>
<tr>
<th>TMW- WB</th>
<th>Control (safety video or usual care)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 225</td>
<td>N = 225</td>
</tr>
</tbody>
</table>

Well Baby Study Overview
Knowledge (Baby SPEAK 10-item) by Group over Time among English-Speaking Parent

**ANCOVA**
Controlling for Education Level

**TMW > Control** (6-month post)

\[
F (1, 200) = 13.80^{***}, \eta^2 = 0.07
\]

**TMW > Control** (7-month post)

\[
F (1, 151) = 11.13^{**}, \eta^2 = 0.07
\]

\( **p < .01. \quad ***p < .001 \)
Knowledge (Baby SPEAK 10-item) by Group over Time among Spanish-Speaking Parents

**ANCOVA**

Controlling for Education Level

**TMW > Control** (6-month post)

\[ F(1, 148) = 16.79^{***}, \eta^2 = 0.10 \]

**TMW > Control** (7-month post)

\[ F(1, 147) = 7.06^{**}, \eta^2 = 0.05 \]

**p < .01. ***p < .001**
NCAST

Nursing Child Assessment Satellite Training

• Assessing behaviors of the parent and the child during a teaching task

• 13 items focusing on maternal behaviors that are explicitly discussed in the Well Baby module videos

Goodson, Layzer, St. Pierre, Berstein, & Lopez, 2000
**Maternal Linguistic Behavior Scale**

**ANOVA on all 13 items**

\[ TMW > \text{Control (6-month post)} \]

\[ F(1, 174) = 3.87^*, \eta^2 = 0.02 \]

\( *p = .05. \)

**Sample Items**

– Caregiver praises child’s successes or partial successes
– Caregiver makes a positive, sympathetic, or soothing verbalization
ANOVAs on 7 items

**TMW > Control** (6-month post)

\[ F(1, 174) = 4.26^*, \eta^2 = 0.02 \]

\( ^*p < .05. \)

**Sample Items**

- Caregiver uses both verbal and non-verbal instruction in teaching the child
- Caregivers makes cheerleading type statements to the child during the teaching interaction
Maternal Use of Complex Language

ANOVA on 4 items

**TMW > Control** (6-month post)

\[ F (1, 174) = 4.50^*, \eta^2 = 0.03 \]

\* \( p < .05 \).

Sample Items

- Caregiver uses at least two different sentences or phrases to describe the task to the child
- Caregiver uses explanatory verbal style more than imperative style in teaching the child
MacArthur-Bates Communicative Development Inventories

• Caregiver-report of a child’s language skills
  – either English or Spanish
• Receptive: being able to understand the words
• Expressive: being able to understand and say the words
• 9-Month and 12-Month Well-Baby visit
English Language Skills (MacArthur-Bates) at 9-Month

**T-Test: Receptive**

\[
\text{TMW} \approx \text{Control} \quad t(246) = 1.12, \quad p > .05
\]

**T-Test: Expressive**

\[
\text{TMW} \approx \text{Control} \quad t(246) = 0.35, \quad p > .05
\]
Spanish Language Skills (MacArthur-Bates) at 9-Month

**T-Test: Receptive**

<table>
<thead>
<tr>
<th></th>
<th>TMW (n=57)</th>
<th>Control (n=68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>18.75</td>
<td>13.49</td>
</tr>
</tbody>
</table>

**T-Test: Expressive**

<table>
<thead>
<tr>
<th></th>
<th>TMW (n=57)</th>
<th>Control (n=68)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>3.02</td>
<td>1.66</td>
</tr>
</tbody>
</table>

* *p < .05. †p < .05.*
**English Language Skills (MacArthur-Bates) at 12-Month**

### T-Test: Receptive

**TMW ≈ Control**  
$t (222) = 0.14, p > .05$

### T-Test: Expressive

**TMW ≈ Control**  
$t (222) = -0.19, p > .05$
Spanish Language Skills (MacArthur-Bates) at 12-Month

T-Test: Receptive

\[ \text{TMW} > \text{Control} \quad t(79) = 2.53^* \]

T-Test: Expressive

\[ \text{TMW} > \text{Control} \quad t(79) = -1.51, p > .05 \]

*p < .05.
Sample: Low-SES Parent-Child Dyads

**TMW-Longitudinal**  
**Control-Nutrition**

<table>
<thead>
<tr>
<th>TMW-Longitudinal</th>
<th>Control-Nutrition</th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 100</td>
<td>N = 100</td>
</tr>
</tbody>
</table>

**TMW-Longitudinal Home Visiting Curriculum**

- **Screening**
- **Preliminary Consent**
- **Enrollment**

**Baseline**  
- Assessment 1  
- Assessment 2  
- Assessment 3  
- Assessment 4  
- Assessment 5

**Intervention**  
- Booster 1  
- Booster 2  
- Booster 3  
- Booster 4

**Supplemental Intervention**

**Post-Test**

<table>
<thead>
<tr>
<th>0m</th>
<th>6m</th>
<th>12m</th>
<th>18m</th>
<th>24m</th>
<th>36m</th>
<th>48m</th>
</tr>
</thead>
<tbody>
<tr>
<td>LENA 1-3</td>
<td>LENA 8-10</td>
<td>LENA 16</td>
<td>LENA 17</td>
<td>LENA 18</td>
<td>LENA 19</td>
<td>LENA 20</td>
</tr>
</tbody>
</table>

**Module**

- Module 1  
- Module 2  
- Module 3  
- Module 4  
- Module 5  
- Module 6  
- Module 7  
- Module 8  
- Module 9  
- Module 10  
- Module 11  
- Module 12
# TMW Home-Visiting: A Longitudinal RCT

<table>
<thead>
<tr>
<th><strong>Experimental: TMW</strong></th>
<th><strong>Control: Nutrition</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>N = 100</td>
<td>N = 100</td>
</tr>
<tr>
<td>12 biweekly 60-min home visits</td>
<td>12 biweekly 30-minute home visits</td>
</tr>
<tr>
<td>Four 30-minute boosters</td>
<td>Four 10-minute booster</td>
</tr>
</tbody>
</table>

- All participants are at or below 200% the Federal Poverty Line
- Assesses children age 13-16 months to kindergarten entry
# Participant Demographics

<table>
<thead>
<tr>
<th>Caregiver Characteristics</th>
<th><strong>TMW</strong> (n = 99)</th>
<th><strong>Control</strong> (n = 95)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ($M$, $SD$)</td>
<td>29.41 yr (6.68)</td>
<td>28.66 yr (7.06)</td>
</tr>
<tr>
<td>African American</td>
<td>80%</td>
<td>82%</td>
</tr>
<tr>
<td>Married or Civil Union</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>HS/GED or some college</td>
<td>64%</td>
<td>64%</td>
</tr>
<tr>
<td>Employed</td>
<td>47%</td>
<td>52%</td>
</tr>
<tr>
<td>WIC and/or LINK</td>
<td>76%</td>
<td>84%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Child Characteristics</th>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Age ($M$, $SD$)</td>
<td>1.18 yr (0.10)</td>
<td>1.19 yr (0.11)</td>
</tr>
<tr>
<td>Male</td>
<td>57%</td>
<td>50%</td>
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</table>
**SPEAK – Survey of Parent/Provider Expectations And Knowledge**

- Parents’ knowledge and beliefs about young children’s cognitive and language development

- Response scale: 0 (strongly agree) to 4 (strongly disagree)

- Sample items:

  "Infants learn little about language in the first six months of their life."

  "Responding to infants every time they cry will only end up spoiling them."

Parent Knowledge (SPEAK) by Group over Time

Baseline
TMW (n=92)
Control (n=90)

Post Intervention
TMW (n=53)
Control (n=60)

6-Month Post
TMW (n=41)
Control (n=50)
Parent Knowledge (SPEAK) by Group over Time

**ANCOVA**
controlling for Baseline Knowledge

**TMW > Control** (post intervention)
\[ F (2, 110) = 24.86^{***}, \eta^2 = 0.18 \]

**TMW > Control** (6-month post)
\[ F (2, 88) = 21.00^{***}, \eta^2 = 0.19 \]

***p < .001
Parent-Child Interaction System (PARCHISY)

• Caregiver behaviors towards child at free-play

• **Positive Behaviors**
  
  - Praise, Explanation, and Open-Ended Questions

• **Negative Behaviors**
  
  - Physical Control, Criticism, and Intrusiveness

• Rating : 1 (*none shown*) to 7 (*consistently shown/exclusive use*)

Deater-Deckard, 2000; Deater-Deckard, Pylas, & Petrill, 1997)
Positive Behaviors by Group over Time

Mixed ANCOVA controlling for education and receptive language skills

TMW > Control (post intervention)

$F (1, 117) = 9.39^{**}$, $\eta^2 = .07$

**$p < .01$**
Negative Behaviors by Group over Time

Mixed ANCOVA controlling for education and receptive language skills

TMW < Control (post intervention)

\[ F(1, 117) = 5.50^*, \eta^2 = .05 \]

* \( p < .05 \)
Parent-Child Interaction System (PARCHISY)

- Parent affect towards child at free-play

  **Positive Affect**
  
  - Warmth, Smiling, and Laughing

  **Negative Affect**
  
  - Rejection, Frowning, and Cold or Harsh Tone

- Rating: 1 *(none shown)* to 7 *(consistently shown/exclusive use)*

Deater-Deckard, 2000; Deater-Deckard, Pylas, & Petrill, 1997
Positive Affect by Group over Time

Mixed ANCOVA controlling for education and receptive language skills

TMW > Control (post intervention)

$F (2, 111) = 1.54, p = .22$
Negative Affect by Group over Time

Mixed ANCOVA controlling for education and receptive language skills

Control > TMW (post intervention)

$F (1, 117) = 1.15, p = .29$
Conversational Turn Count

• Hourly estimate of the frequency of adult communicative interactions with the child
• Measure of the home language environments
Conversational Turn Count (CTC) by Group over Time

Baseline

Mid Intervention

Post Intervention

6-Month Post

TMW (n=98)

Control (n=94)

TMW (n=69)

Control (n=64)

TMW (n=47)

Control (n=52)

TMW (n=42)

Control (n=45)
Conversational Turn Count (CTC) by Group over Time

CTC Mean Score

<table>
<thead>
<tr>
<th></th>
<th>Baseline TMW (n=98)</th>
<th>Mid Intervention TMW (n=69)</th>
<th>Post Intervention TMW (n=47)</th>
<th>6-Month Post TMW (n=42)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control (n=94)</td>
<td>Control (n=64)</td>
<td>Control (n=52)</td>
<td>Control (n=45)</td>
</tr>
<tr>
<td>Mean</td>
<td>25.92</td>
<td>25.36</td>
<td>29.60</td>
<td>35.30</td>
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<tr>
<td>95% CI</td>
<td>24.89</td>
<td>30.80</td>
<td>39.10</td>
<td>42.04</td>
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</tbody>
</table>

Center for Early Learning + Public Health
TMW’s Model for a Parent-Centered Public Health Approach to Early Learning

Community Partnership
(Parent and Community Informed Programming, Community Engagement, and Public Awareness)

Maternity Wards
(TMW-Newborn)

Pediatric Clinics
(TMW-Well Baby, TMW-Pediatrics)

Home Based
(TMW-Home Visiting, Project ASPIRE)

Community Based Organizations
(TMW-Let’s Talk!, TMW-Let’s Talk Dads!)

Formal Early Learning/Child Care Centers
(TMW-Early Childhood Educator, CogX Parent Academy)

TMW Ambassadors
(TMW-Spread the Words)

Center for Early Learning + Public Health
TMW’s *Parent*-Centered Public Health Approach to Early Learning

- **Asset** based

- Places parents and caregivers at the center

- Connect with families at **multiple touch points** across systems throughout first three years of a child’s life

- Developed in **partnership** with parents, providers and communities

- Technology driven, human-assisted

- Designed to work in conjunction with other programs (e.g. Reach out and Read, VROOM, Healthy Steps)
TMW Center for Early Learning + Public Health

- Joint venture - Biological Sciences and Social Sciences Divisions
  Co-Directors: Dana Suskind, MD
  John List, PhD

- Advances public health approach for early learning informed by behavioral economics

- Leverages technology platform to facilitate intervention at scale and drive innovation

- Develops city- and community-wide implementation and evaluation models
TMW’s Strategic Priorities

Develop evidence-based interventions and tools in early childhood – Refine and build out a broader suite of TMW Initiative interventions, leveraging the feedback-driven innovation cycle to continue to iterate on design and application of interventions

Demonstrate community-wide proof points – Collaborate with 1-2 pilot communities and local partners to embed the integrated suite of TMW interventions at scale within existing health, education, and community social service systems, reaching a significant portion of the target population

Advance the science of scaling – Develop a robust research base on interventions that impact educational outcomes and drive greater uptake of evidence-based interventions by public health and education systems by leveraging a network of interdisciplinary research sites to test and validate science-based interventions – advance the science of science

Catalyze the field – Advance the awareness and capability of health, education, and social services leaders in the application of the public health approach in the early childhood space
Collaborate with 1-2 pilot communities and local partners to embed the integrated suite of TMW interventions at scale within existing health, education, and social service systems reaching a significant portion of the target population.
Gratitude to our Generous Funders and

- PNC Foundation
- Hemera Foundation
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