ACKNOWLEDGEMENTS & DISCLOSURES

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- I gratefully acknowledge the co-investigators, project staff, UNC students, public school personnel, and children and families, all of whom were vital to this project.

- Disclosure: I am the first author on the intervention manual that resulted from this project. Although not currently commercially available, this manual may be commercially published and distributed in the future.
http://pearls.med.unc.edu
Objectives

- Differentiate between translational research and “traditional” clinical research
- Explain the theory of change for a school intervention targeting social-communication and pretend play skills for preschoolers with ASD
- Describe three strategies for fostering translations between research and practice in serving children with ASD in public schools
TRANSLATIONAL RESEARCH
“Go see the human beings who are suffering, and then ask yourself, is the work I did today relevant to human suffering? Did I do something that is going to help to change somebody’s life, maybe not today, but sometime soon?”

-Christopher Reeve
Clinical Trial Model

Pre-clinical | Phase I | Phase II | Phase III | Phase IV
---|---|---|---|---
Theory | Modeling studies | Exploratory trial | Definitive randomized controlled trial | Long-term Implementation

SOURCE: http://circ.ahajournals.org/content/119/14/1962/F1.expansion.html
"the conscientious, explicit and judicious use of current best evidence in making decisions about the care of the individual patient. It means integrating individual clinical expertise with the best available external clinical evidence from systematic research."
(Sackett D, 1996)
Low, Slow Yields in Medical Translational Research

Median translation lag = 24 years from 1st description to earliest highly cited clinical article

(Contopoulos-Ioannidis, Alexiou, Gouvias, & Ioannidis, 2008)
TRANSLATIONAL RESEARCH: T1 to T4

- Basic Science to Humans
- Patients
- Community Practice
- Populations
JUST NEW BUZZWORDS OR MEANINGFUL CHANGE?

SOURCE: http://consumercentric.biz/wordpress/?p=106
“Translational medicine encompasses all the disciplines that intervene in moving scientific progress from the bench to the bedside and in conveying stimulating information from the bedside back to the bench”

(Ioannidis, 2004)
“Translation is a Two-Way Street”

Kon, 2008

- Translate scientific findings to everyday practice & improvement of outcomes
- Translate concerns of the general population into goals for scientific inquiry
INVEST TIME IN CONSTRUCTION
Pay Attention to the Process
FIGURE OUT THE RULES FOR TWO-WAY TRAVEL
Have a Meaningful Destination
EXPECT SOME BREAKDOWNS
Be Open to the Unexpected
COMPONENTS OF INTERVENTION PROGRAMS

Context

Content

Strategies

Intervention
“Adults cannot directly teach children all the skills needed for adult life. Appropriate learning depends on the child himself or herself taking on the responsibility for learning throughout the day by imitating others, engaging others, and exploring the potential of the various environments.”

Rogers and Vismara (2008)
Focus groups of teachers, SLPs, OTs from NC public schools

Play: Systemically undervalued as a goal
“Pretend play can get brushed aside because other things are more important.”
“We’re not supposed to write play goals into their IEPs.”
“Play is an unfortunate word for what these children need to do.”

Play: Valued by teachers and related service providers
“Getting those play skills as far along in preschool as we can is imperative ... because they’re not going to get it in kindergarten. They’re not playing in kindergarten.”
Focus Groups...

- **Play: A realistic goal?**
- "We’ve had a lot of discussion in our district about really the right way to go with this whole symbolic play thing with preschool children with autism, because recognizing, particularly for the kids with really severe autism, it can be a very, very difficult skill and realistically, you know, what level are they gonna achieve? ...So I think in our district we tend to focus a little bit more on joint attention than we do on the symbolic play."

Need for societal support
“...There are a lot of expectations, but play is not something I am hearing other people saying, ‘So, how do they play?’”

Paying attention vs. joint attention
Example of goal
“...[The child] will engage in an adult-directed task for one minute.”
Collaboration with parents
“I am probably most dissatisfied with the support we give to parents. I really feel like that is a huge thing that we just don’t address.”

Contributions of peers
“They seem to learn much faster, quicker through another child.”

Collaboration of instructional personnel
“I think the rapport building process is huge for success in the classroom.”

Challenges in incorporating peers
“Sometimes, don’t take this the wrong way, but sometimes peers can be a barrier to increasing social skills.”
System “culture” as barrier
“It’s really interesting what you may hear at those transition meetings and it sounds sort of like, ‘Well, we do it this way’ rather than ‘This is what seems to be working for your child.’ So it’s system-driven.”

Related services (OT, SLP)
“...I think...one of the best ways we address the social and the play skills is being a regular part of the classroom.”

System Disconnects
“Now the diagnostic team is just doing testing and we are getting test results having never seen the child. It’s a joke. It’s a joke being asked to write goals for children we have never seen.”
### SUMMARY FROM FOCUS GROUPS (FLIPPIN ET AL., IN PREPARATION)

<table>
<thead>
<tr>
<th>Valued Intervention Components</th>
<th>Perceived Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Child Level</strong></td>
<td><strong>Provider Level</strong></td>
</tr>
<tr>
<td>Motivating &amp; Fun</td>
<td>Lack of generalization</td>
</tr>
<tr>
<td>Functional for all levels</td>
<td>Peers</td>
</tr>
<tr>
<td>Sensory needs/preferences</td>
<td>No mechanism for collaboration</td>
</tr>
<tr>
<td>Includes peers</td>
<td>Service intensity not driven by child needs</td>
</tr>
<tr>
<td><strong>Provider Level</strong></td>
<td><strong>System Level</strong></td>
</tr>
<tr>
<td>Collaboration</td>
<td>Training &amp; turn over</td>
</tr>
<tr>
<td>Evidence-based</td>
<td>Play- undervalued</td>
</tr>
<tr>
<td>User-friendly</td>
<td>Disconnect from assessment team</td>
</tr>
<tr>
<td><strong>System Level</strong></td>
<td>Limited resources (e.g. time, space)</td>
</tr>
<tr>
<td>Administrative support/ buy-in</td>
<td>Delay in getting services</td>
</tr>
<tr>
<td>Fits with existing curricula</td>
<td>Transition to kindergarten</td>
</tr>
</tbody>
</table>
DEVELOPMENT AFTER FOCUS GROUPS

Manual: 1:1 Context

User feedback

Trial of full model with school teams

User feedback

Trial of 1:1 & Group with school teams SCD

Practitioner, tryout & feedback

Practitioner, tryout & feedback

Small Coaching Model Trial

User feedback

Trial of 1:1 with SLP students

Manual: Group Context

User feedback

User feedback
Manual

- Introduction to JA and SP as pivotal skills
- Links of pivotal skills to academically relevant outcomes*
- Potential roles of different team members & collaboration strategies*
- Introductory handout for administrators*
- Assessment strategies & forms (initial & ongoing)
- Teaching objectives in social-communication and play
- “Picture dictionary” to explain & illustrate teaching objectives*
- Intervention intensity guidelines
- Teaching strategy options
- Sample activities for 1:1 and group for each teaching objective*
- Parent handouts
- Appendix on research *
ADDITIONAL ASAP COMPONENTS

- DVD
- Pre-intervention training workshop*
- Coaching (with manual for coaches)*

*not originally proposed as part of the development project
• **Social Interaction:** Communicating to engage with a person

• **Requesting:** Communicating to gain access to something, someone, or some action

• **Joint Attention:** Communicating to share interest in an object or an event with another person
<table>
<thead>
<tr>
<th>Skill Levels</th>
<th>Social Interaction</th>
<th>Requesting</th>
<th>Joint Attention</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Categories</strong></td>
<td><strong>Age of Emergence: 8-15 months</strong></td>
<td><strong>Age of Emergence: 8-15 months</strong></td>
<td><strong>Age of Emergence: 10-18 months</strong></td>
</tr>
<tr>
<td><strong>SI1.</strong> While playing face to facegames, physical activities, or routines, child watches the adult closely</td>
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<tr>
<td><strong>SI2.</strong> While playing face to face games, physical activities, or routines, a brief pause child shows wanting the game to continue (e.g., looks, moves body to make a motion of the game,iwashes the partner, vocalizes)</td>
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</tr>
<tr>
<td><strong>SI3.</strong> Child plays back-and-forth games with objects or actions (e.g., exchanges objects back-and-forth; back-and-forth game of mutating actions)</td>
<td><strong>RQ1.</strong> Child reaches for out of reach object to show wanting the object</td>
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</tr>
<tr>
<td><strong>SI4.</strong> Child initiates familiar games or routines (i.e., not right after an adult does the action)</td>
<td><strong>RQ2.</strong> Child gives objects or pulls person’s hand toward objects to show request for help</td>
<td></td>
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<tr>
<td><strong>SI5.</strong> Child expands games or routines, e.g.,</td>
<td><strong>RQ3.</strong> Child looks at nearby objects when another person points to the objects as a request (i.e., objects within reaching distance)</td>
<td><strong>JA1a.</strong> Child responds to another person giving objects just to share interest in the object</td>
<td></td>
</tr>
<tr>
<td>- Includes a third person in the game/routine</td>
<td><strong>RQ4.</strong> Child points to nearby objects to request them</td>
<td><strong>JA1b.</strong> Child gives objects just to share interest in objects with another person</td>
<td></td>
</tr>
<tr>
<td>- Switches roles with other person (e.g., finder versus hide)</td>
<td><strong>RQ5.</strong> Child looks at distant objects when another person points to the objects as a request (i.e., objects that are beyond reach)</td>
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<tr>
<td><strong>SI6.</strong> Child combines gesture and/or vocalization/verbalization with looking at person to show wanting game to continue</td>
<td><strong>RQ6.</strong> Child points to more distant objects to request them (i.e., objects that are beyond reach)</td>
<td><strong>JA2a.</strong> Child shows objects just to share interest in the objects with another person</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>RQ7.</strong> Child combines gesture and/or vocalization/verbalization with looking at person to request</td>
<td><strong>JA2b.</strong> Child shows objects just to share interest in the objects with another person</td>
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<td></td>
<td></td>
<td><strong>JA3.</strong> Child follows a point to nearby objects/events just to share interest in objects/events</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>JA4.</strong> Child points to nearby objects/events just to share interest in objects/events with another person</td>
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</tr>
</tbody>
</table>
DEVELOPMENT OF PLAY

- **Exploratory:** Exploring objects
- **Relational:** Using objects together in simple ways
- **Functional:** Using objects for their intended purpose, “playfully”
- **Symbolic:** Incorporating object substitution, pretend objects, or role play
### Table 2: Skill Levels Across Four Categories of Play

<table>
<thead>
<tr>
<th>Skill Levels</th>
<th>Exploratory Age of Emergence: 2-10 months</th>
<th>Relational Age of Emergence: 10.18 months</th>
<th>Functional Age of Emergence: 12.18 months</th>
<th>Symbolic Age of Emergence: 18.30 months</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exploratory</strong></td>
<td><strong>Age of Emergence: 2-10 months</strong></td>
<td><strong>Relational Age of Emergence: 10.18 months</strong></td>
<td><strong>Functional Age of Emergence: 12.18 months</strong></td>
<td><strong>Symbolic Age of Emergence: 18.30 months</strong></td>
</tr>
<tr>
<td>E1. Child picks up and looks at a toy</td>
<td>E1. Child seen to play with puzzle pieces</td>
<td>F1. Child plays with toys in functional or simple pretend ways</td>
<td>S1. Child uses one toy object to represent or stand for another</td>
<td></td>
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<tr>
<td>Example:</td>
<td>Example:</td>
<td>Examples:</td>
<td>Examples:</td>
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<tr>
<td><em>Picks up, looks at, puts down block</em></td>
<td><em>Picks up, looks at, puts down block</em></td>
<td><em>Stirs spoon in cup</em></td>
<td><em>Cuts block as a hairbrush or cup</em></td>
<td></td>
</tr>
<tr>
<td><em>Picks up, looks at, puts down ball</em></td>
<td><em>Puts pieces of puzzle together</em></td>
<td><em>Pushes truck in purposeful path</em></td>
<td><em>Wipes sponge in bowl as food</em></td>
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<tr>
<td><strong>Relational</strong></td>
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<tr>
<td>R1. Child plays with toys using both hands together (may include banging, shaking, rubbing, squeezing, mouthing, licking, sucking)</td>
<td>R1. Child takes pieces of toys apart</td>
<td>F1. Child plays with toys in simple pretend ways directed to self</td>
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<tr>
<td>Example:</td>
<td>Example:</td>
<td>Examples:</td>
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<tr>
<td><em>Puts pieces of puzzle together</em></td>
<td><em>Detaches large pop beads</em></td>
<td><em>Feeds self with angry spoon</em></td>
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<td></td>
</tr>
<tr>
<td><em>Puts pieces of puzzle together</em></td>
<td><em>Removes lid from container</em></td>
<td><em>Brushes own hair with plastic hairbrush</em></td>
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<tr>
<td><strong>Functional</strong></td>
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<td></td>
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<tr>
<td>Example:</td>
<td>Example:</td>
<td>Examples:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Stirs spoon in cup</em></td>
<td><em>Shakes spoon in cup</em></td>
<td><em>Feeds adult with spoon</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Pushes truck in purposeful path</em></td>
<td><em>Pushes truck in purposeful path</em></td>
<td><em>Comb adult’s hair with comb</em></td>
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<tr>
<td><strong>Symbolic</strong></td>
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<tr>
<td>S1. Child uses one toy object to represent or stand for another</td>
<td>S2. Child uses pretend qualities in play</td>
<td>S3. Child uses one toy object to represent or stand for another</td>
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<td></td>
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<tr>
<td>Example:</td>
<td>Example:</td>
<td>Examples:</td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Cuts block as a hairbrush or cup</em></td>
<td><em>Comb adult’s hair with comb</em></td>
<td><em>Comb adult’s hair with comb</em></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Wipes sponge in bowl as food</em></td>
<td><em>Makes “vomit” gesture when pretending to eat play dough</em></td>
<td><em>Wipes face or mouth</em></td>
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<td></td>
</tr>
</tbody>
</table>
### Requesting

| RQ1. | Child reaches for out of reach object to show wanting the object
|   | McKenzie reaches for the sponge that Oceania took from her.
|   | This occurs when an object is far enough away that the child cannot reach it, and the child reaches towards the object. This is often an open hand reach, but could also be an action in which the child opens and closes his/her hand repetitively. Reaching towards an out of reach object shows that the child wants the object and is beginning to understand that reaching will communicate to another person that s/he wants that object:
|   |   - Child reaches for a tool that s/he wants to use to play with play-dough.
|   |   - Child reaches for marbles that adult is holding so s/he can play marble track.
|   |   - Child reaches for a juice box across the table during snack time.

| RQ2. | Child gives objects or pulls person’s hand toward objects to show request for help
|   | Abby gives her teacher the glue bottle to get help opening it.
|   | This occurs when the child is having difficulty with a task (e.g., opening a container) and either gives an object to another person or pulls another person’s hand toward the task to get help. Giving or pulling someone’s hand to request help shows that the child is beginning to understand that other people can help with difficult tasks, and that s/he can communicate to get help:
|   |   - Child gives another person a closed bottle of bubbles so the bubbles are opened.
|   |   - Child pulls another person’s hand towards the faucet in order to get help turning on the water.
|   |   - Child pushes the ends of his/her coat towards another person to get help with zipping the coat.

| RQ3. | Child looks at nearby objects when another person points to the objects as a request
|   | Liam follows Mr. Bob’s point to the zebra tie in asking to borrow.
|   | This occurs when another person points to a near-by object to request that object and the child looks at that object. Nearby is defined as being within reach. Responding to another person’s point by looking at a nearby object shows that the child is beginning to understand that pointing is a form of communication that references a nearby item:
|   |   - Another person points to the red crayon and the child looks towards the crayon.
|   |   - Someone points to the box of crackers during snack time and the child looks at the box of crackers.
|   |   - A peer points to the blue block and the child looks at the blue block.
ASAP IN THE REAL WORLD: SOCIAL-COMMUNICATION INITIATIONS

(DYKSTRA ET AL., 2012, AUTISM)
ASAP IN THE REAL WORLD: PRETEND PLAY ACTS
(DYKSTRA ET AL., 2012, AUTISM)
AVERAGE RATING OF CHILD’S PLAY & COMMUNICATION (DYKSTRA ET AL., 2012, AUTISM)

Rated by 13 Preschool Teachers, Blind to Study Design & Pre-Post Status

<table>
<thead>
<tr>
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<th>Pre</th>
<th>Post</th>
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<tbody>
<tr>
<td>Selena</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Kelsey</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Blake</td>
<td></td>
<td>9</td>
</tr>
</tbody>
</table>

Selena Kelsey Blake
Pre Post Status
Rated by 13 Preschool Teachers, Blind to Study Design & Pre-Post Status
Focus groups raised points with implications for real-world implementation

Multiple opportunities for school personnel feedback: shaped ASAP

Used ASAP in different classrooms with diverse students—further shaped intervention

School teams benefitted: access to ASAP, positive student changes

Research team benefitted: appreciation for value of partnering with school personnel & some skills in being better partners

Hoped-for benefit: the version ASAP we are testing in an efficacy study will be more translatable due to development process
In the Future

- Is ASAP efficacious in public school settings? Is the theory of change supported? If so:
  - Are benefits enough to be worth the costs?
  - Are some existing alternatives better?
  - How and when should we disseminate the model?
  - What level of support is required in public school preschools? Is this feasible for school systems?
  - What are the active ingredients of the ASAP package? What can be omitted or adapted? Added or improved?
  - How would we travel on two-way streets with school systems (and other entities) for T3/T4 translations?
The goal of translational research is efficient and effective translation of research findings to improve the well-being of people, communities, & populations.

Interdisciplinary collaborations, partnering with community stakeholders, and working from practice-to-research as well as research-to-practice are all strategies aimed at accomplishing the above goal.

Translational research in public schools holds enormous potential for impacting the well-being of individuals with ASD.

For ASAP, travels of researchers and school personnel on the two-way street had a major impact on the specifics of the intervention developed.