Symbol-Infused Play

for Children with Complex Communication Needs

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GOALS

- This presentation will:
  - Review the 3 stages of play in typically developing infants and toddlers, up to but not including symbolic play
  - Discuss the importance of play
  - Discuss challenges faced by children with CCN who may require AAC
  - Present strategies to promote play, communication, and language development in these children
  - Emphasize infusing symbols in play

DEFINITION OF "PLAY"

- Early social interactions between caregivers and their infant that do not consist of caregiving activities are considered "play" (Roggman, Bryce, & Newland, 2000).

- "play consists of *spontaneous, naturally occurring activities with objects that engage attention and interest*" (Lifter, Mason, & Barton, 2011, after Bloom & Lifter, 1998)

Complex Communication Needs (CCN)

...some young children do not develop speech and language skills as expected due to motor, language, cognitive, and/or sensory perceptual impairments that may result from cerebral palsy, autism, Down syndrome, or other developmental disabilities. (Light & Drager, 2007, p. 204)

IMPORTANCE OF PLAY

- Play is the means through which young children learn about themselves, other people, and the world around them.

- Soon after birth, caregivers initiate interactions with their baby through touch, movement, vision, and sound; they engage in MULTISENSORY, reciprocal experiences

- Play and communication are a natural part of caregiver-infant interaction beginning in the first moments of life

IMPORTANCE OF PLAY

- As babies begin to develop greater control of their physical abilities, they produce actions, vocalizations, and facial expressions, thereby evoking reciprocal behaviors from parents

- Parallel developments in play and language

- For children with significant developmental disabilities, play and communication may be quite effortful and/or limited from the beginning.

IMPORTANCE OF PLAY

- Understanding play, communication, and language development in typically developing children in natural environments during daily activities and routines with their parents will...

- Help us assess and facilitate the growth of these abilities in children with complex communication needs who may require AAC (Lifter, 2000)

STAGE I: SOCIAL PLAY

STAGE I: SOCIAL PLAY

- Description
  - A "visual communication system" (Preisler, 1991): Parents' use eye contact, exaggerated facial expressions, smiles, intonation, positive affect, close proximity
  - Infants respond with social smile and body movements (Rochat, Querido, & Striano, 1999)
  - Predictable, repetitive routines in play with a beginning, middle and end (Rochat et al., 1999)
  - Initially, parent is active partner and infant is passive
  - Later, infant becomes more active
  - Turn-taking becomes more balanced

STAGE I: SOCIAL PLAY

- Importance
  - Foundation of communication: "proto-conversation" (Bateson, 1975)
  - Infant attends to intonation and affect
  - Infant gazes, smiles, vocalizes, moves arms and legs in response to parents and parents interpret these behaviors as intentional
  - Parents highly responsive to infants and infants become highly responsive to parents
  - Beginning of turn-taking

STAGE I: SOCIAL PLAY

STAGE I: SOCIAL PLAY

- Challenges for children with CCN
- Cerebral palsy:
  - Significant motor impairment and persisting and exaggerated primitive reflexes impact child's responsivity (Blasco, 1994; Capute, Shapiro, Accardo, Wachtel, Ross, & Palmer, 1982)
  - May have co-occurring medical problems such as feeding difficulties, seizure disorders, visual impairment (Colver, Fairhurst, & Pharoah, 2014)
  - Limited facial expressions, more negative affect, less frequent smiles; subtle behaviors that are difficult to interpret (Rogers, 1988)

STAGE I: SOCIAL PLAY

STAGE I: SOCIAL PLAY

- Challenges for children with CCN
- Down syndrome:
  - Initial delay in onset of eye contact and long periods of gaze with parents and subsequent persistent gaze and smiling (Berger & Cunningham, 1981)
  - Visual deficits and difficulty shifting gaze (Courage, Adams, Reyno, & Kwa, 1994)
  - Hypotonia and delayed motor development (de Campos, da Costa, Savelsbergh,... Rocha, 2013; Tudella, Pereira, Basso, & Savelsbergh, 2011)

STAGE I: SOCIAL PLAY

STAGE I: SOCIAL PLAY

- Challenges for children with CCN
- Autism spectrum disorder:
  - Lower amounts of synchronization between at-risk infants and mothers (Yirmiya, Gamliel, Pilowski, Feldman, Baron-Cohen, & Sigman, 2006)
  - Different patterns of postural and motor development (Nickel, Thatcher, Keller, Wozniak, & Iverson, 2013)

STAGE I: SOCIAL PLAY

- Strategies to support play, communication, and language development
  - Face-to-face interactions
  - Parents may need help in recognizing their infants' subtle behaviors
  - Use touch, movement, and vocalizations to interact with infants (multisensory)
  - Use infant-directed motion and speech to engage infants in social play

STAGE I: SOCIAL PLAY

- Strategies to support play, communication, and language development
  - Establish routines and consistent patterns of interactions (predictable songs, games, and stories)
  - Use pauses and expectant looks to give infants opportunities to respond
  - Infuse symbols into routines
    - Object symbols
    - Manual signs and aided communication displays/ devices should be aligned with adult's eye gaze so that the infant does not have to shift attention during social play (Smith, McCarthy, & Benigno, 2009)

OBJECT SYMBOLS
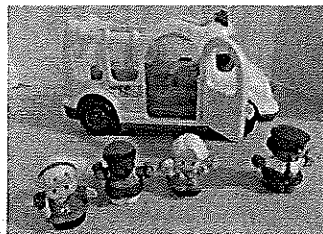
MANUAL SIGNS

PLACEMENT OF AAC SYSTEM

Aligned

Divided

Smith, McCarthy,
& Benigno; 2009,
p. 170.)

STAGE II: EXPLORATORY PLAY

STAGE II: EXPLORATORY PLAY

* **Description**
  * Parents use infant-directed motion (Brand, Shallcross, Sabatos, & Massie, 2007) to make their actions more salient to infants
  * Parents use of infant-directed motion is synchronized with their verbalizations (Gogate, Bahrick, & Watson, 2000)
    * Highly interactive, limited range of movement, close proximity to infant, repetitive, simplistic motions (Brand, Baldwin, & Ashburn, 2002)

STAGE II: EXPLORATORY PLAY

* **Description**
  * Infants first begin to follow their parents' gaze and pointing
  * Then infants begin to call attention to themselves and direct parents' attention through gestures: show, give, and point
  * Parents use infant-directed speech when following-in to infant's focus of attention → more salient
    * Elevated and exaggerated pitch and slower rate of speech (Fernald,1985)
    * Reduced utterance length, simpler syntax, repetition of sentences and phrases, limited use of pronouns (Snow, 1972)
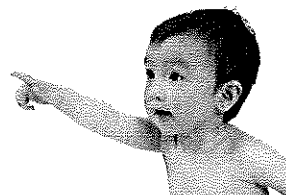

STAGE II: EXPLORATORY PLAY

* **Importance**
  * Infants explore objects through all of their senses: sight, hearing, taste, smell, and touch
  * Infants learn about the general properties of objects by manipulating them in nonspecific ways
    * Mouthing, banging, shaking, dropping, taking objects apart
  * Object permanence
  * Adults 'socialize' object play at first before infants can (Bakeman & Adamson, 1984), by talking about objects

STAGE II: EXPLORATORY PLAY

* **Importance**
  * Intentionality develops (Siegel & Cress, 2002)
    * Direct action toward parent to gain attention
    * Shift gaze from object to parent
    * Persist in and intensify behaviors until goal is achieved
    * Cease behavior when goal is achieved
    * Express pleasure when goal is attained or displeasure when it is not
  * Pre-linguistic communication develops: requesting, commenting, protesting, obtaining information
  * Infants begin to engage in joint attention (Carpenter, Nagell, & Tomasello, 1998)
  * Receptive language begins to develop

STAGE II: EXPLORATORY PLAY

STAGE II: EXPLORATORY PLAY

- Challenges for young children with CCN
  - Cerebral palsy:
    - Motor impairment impacts ability to sit with support or unsupported and use hands to reach for and grasp objects and explore objects
    - Infants with CP are more passive: look at objects rather than actively explore them
    - Mothers tend to engage in more proximal behaviors: touching, kissing, holding, fewer distal behaviors: talking, singing, looking and smiling at their infants (Brooks-Gunn & Lewis, 1984).

STAGE II: EXPLORATORY PLAY

- Challenges for young children with CCN
  - Down syndrome
    - Delayed acquisition of early motor skills (Pereira, Basso, Lindquist, da Silva & Tudella, 2013); hypotonia and difficulty bringing hands to midline and grasping (de Campos et al., 2013)
    - Deficits in manipulative object play (Legerstee & Weintraub, 1997; Gowen, Goldman, Johnson-Martin, & Hussey, 1989)
    - More likely to engage in passive behaviors like looking or holding toys rather than active manipulation (Landry & Chapieski, 1989)
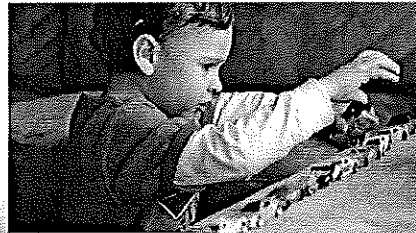
STAGE II: EXPLORATORY PLAY

- Challenges for young children with CCN
  - Autism spectrum disorders
    - Delays in sitting, reaching, and grasping and bringing objects to mouth (Koterba, Leezenbaum, & Iverson, 2014)
    - Able to follow eye gaze and respond to joint attention, but may have difficulty with sustained looking time to a target (Bedford, Elsabbagh, Gliga, Pickles, Senju, Charman, & Johnson, 2012)
    - Difficulty initiating gaze, so may not understand the significance of a parent's interaction with an object (Bhat, Galloway, & Landa, (2010)

STAGE II: EXPLORATORY PLAY

- Challenges for young children with CCN
  - Autism spectrum disorders
    - Exhibit unusual patterns of object exploration; Restrictive and repetitive atypical behaviors (such as spinning, rolling, rotating, unusual visual regard) can interfere with purposeful object exploration;
    - Infants at risk for autism may exhibit a generalized problem with movement initiation (Nickel, Thatcher, Keller, Wozniak, & Iverson, 2013)

STAGE II: EXPLORATORY PLAY

STAGE II: EXPLORATORY PLAY

- Strategies to support play, communication, and language
  - Seating and positioning supports to encourage reaching and grasping at midline (Lobo, Harbourne, Dusing, & McCoy, 2013)
  - Offer large, soft objects that are easier to grasp (de Campos, de Costa, Savelsbergh, & Rochas, 2013)
  - If unable to grasp: use Velcro™ bands attached to their wrists to help them pick up and explore objects (Lobo & Galloway, 2008) or Sticky Mittens' and provide frequent play opportunities (Libertus & Landa, 2014; Needham, Barrett, & Peterman, 2002), caregivers use verbal encouragement

"STICKY MITTENS"
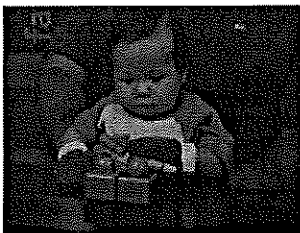
STAGE II: EXPLORATORY PLAY

- Strategies to support play, communication, and language
  - Provide play surface with edges to contain toys and attach to surface
  - Explore objects with feet (Galloway & Thelen, 2004)
  - "Vocal play" → engage in sound play, sound effects with Voice Output Communication Aid/SGD
  - Infuse symbols:
    - Manual signs should be presented in child's signing space.
    - Aided communication devices should be presented near the objects so that infant does not have to shift attention

STAGE II: EXPLORATORY PLAY

Throw toys

Search for toys

Point to toys farther away

Banging toys against surface

Drop toys

Bring toys to mouth
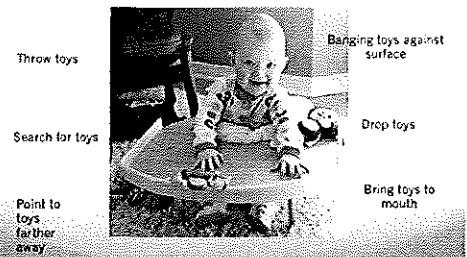
STAGE III: FUNCTIONAL PLAY

- ◦ **Description**
  - • Functional play is more specific to the characteristics of the objects
  - • Requires more fine motor control (Contaldo, Cola, Minichili, Crecchi, Rossi, and Bonfiglio, 2013)
  - • Infants' gestures evolve from their actions on objects (Capirci, Contaldo, Caselli, & Volterra, 2005)
  - • Parents use more referential language with greater information content: nouns, verbs, adjectives, adverbs and less regulatory language with commands, prohibitions and pronouns (Tamis-LeMonda, Kuchirko, & Tafuro, 2013)
  - • Parents demonstrate functional actions on objects

STAGE III: FUNCTIONAL PLAY

- ◦ **Description**
  - • Infants begin to act on objects in the ways they were first presented
  - • Then, they combine objects in novel ways depending on their specific properties
  - • These behaviors depend on having an idea about something not observable in the immediate environment and the ability to implement a plan; both rely on an increased memory capacity (Lifter & Bloom, 1989)
  - • Gesture + word combinations precede two-word combinations and may signal need for expanded verbal input from parents (Iverson & Goldin-Meadow, 2005) Example: child may point to a keys on table and say "daddy" indicating they are "daddy's keys"

STAGE III: FUNCTIONAL PLAY

- ◦ **Importance**
  - • Infants' actions on objects show how they think about objects in relation to other objects, the environment, their parents, and themselves
  - • Parents language follows-in to infants' focus of attention by maintaining the activity (Silter & Sigman, 2002)
  - • First words are expressions of infants' ideas:
    - ◦ Existence, disappearance, attributes, locations, possession, and other early semantic relations (Lifter & Bloom, 1998)

STAGE III: FUNCTIONAL PLAY

- ◦ **Importance**
  - • Infants learn about the specific properties of objects by manipulating them:
    - ◦ Balls roll, cars go, bubbles pop
  - • These properties form foundation for relations between objects
  - • When infants have a vocabulary of at least 20 words and are adding about 12 new words a month, they start to engage with the specific properties of objects (Lifter & Bloom, 1989)
  - • Infants are actively exploring environment by crawling and then walking

STAGE III: FUNCTIONAL PLAY

- ◦ **Challenges for young children with CCN**
  - • Cerebral palsy:
    - ◦ Difficulty sustaining engagement with toys in interactions with parents (Smidt & Cress, 2004)
    - ◦ Difficulty independently moving toward objects of interest in environment
    - ◦ Difficulty manipulating objects
    - ◦ More passive onlooking

STAGE III: FUNCTIONAL PLAY

- ◦ **Challenges for young children with CCN**
  - • Down syndrome:
    - ◦ Delays in gross motor skills: sitting independently, crawling, and walking (Pereira, Basso, Lindquist, da Silva, & Tudella, 2013)
    - ◦ Delays in fine motor skills: performing actions on objects, grasping, showing, giving, and pointing (Gowen, Goldman, Johnson-Martin, & Hussey, 1989)
    - ◦ Mothers use more deictic gestures such as showing throughout a spoken message to help child attend to the topic, improve comprehension, and maintain child's focus of attention (Iverson, Longobardi, Spampinato, & Caselli, 2006)

STAGE III: FUNCTIONAL PLAY

STAGE III: FUNCTIONAL PLAY

- ◦ **Challenges for young children with CCN**
  - • Autism spectrum disorder
    - ◦ Atypical behaviors when interacting with objects
    - ◦ Exhibit lesser amounts gestures of giving and pointing (Yirmiya et al., 2006)
    - ◦ Children more often perform functional play on single objects rather than combinatorial functional play (Thiemann-Bourke, Brady, & Fleming, 2012)
    - ◦ Tend to engage with objects in the way the objects were first presented to them (Thiemann-Bourke et al., 2012)

STAGE III: FUNCTIONAL PLAY

- ◦ **Strategies to support play, communication, and language**
  - • Use Added Language Modeling, which has characteristics of infant-directed language and motion (Drager, 2009; Drager, Postal, Carrolus, Castellano, Gagliano, & Glynn, 2006)
  - • Respond to infants' use of body and head pointing by following in to child's attention
  - • Use 'active touch' to help young child manually explore objects
  - • Symbol-infused joint attention (Benigno & McCarthy, 2012): incorporate object and action labels ('symbols,' photos, visual scene displays) within child's focus of attention
  - • Produce manual signs within the child's signing space while child is engaged with toys and objects (Harris, Clibbens, Chasin, & Tibbits, 1989)

STAGE III: FUNCTIONAL PLAY

- Strategies to support play, communication, and language
  - Visual scene displays organize language in thematic units that are meaningful to the child and parent (Light & Drager, 2007)
  - Increase opportunities to add new concepts; use "just in time" technology to add concepts in teachable moments (Light & Drager, 2007)
  - Use photographs of children and parents (and other family members) interacting in familiar routines and games (Wilkinson & Light, 2014)
  - Place communication aids and displays next to the toys with parent and child side-by-side to support joint attention to communication aid and toys (Benigno, Bennett, McCarthy, & Smith, 2011)
  - Use motivating activities and toys

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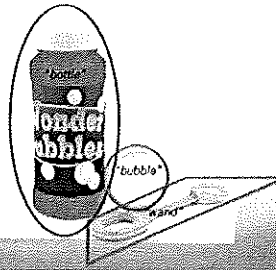
VISUAL SCENE DISPLAY
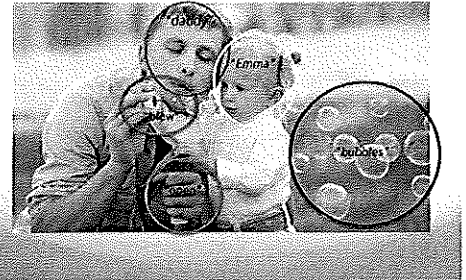
TOY FARM
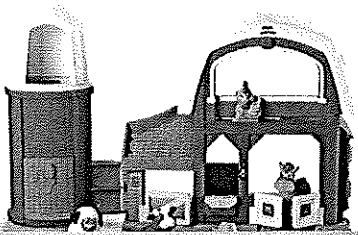
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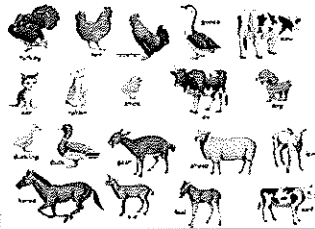
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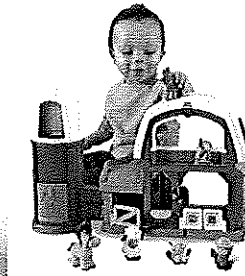
STAGE III: FUNCTIONAL PLAY

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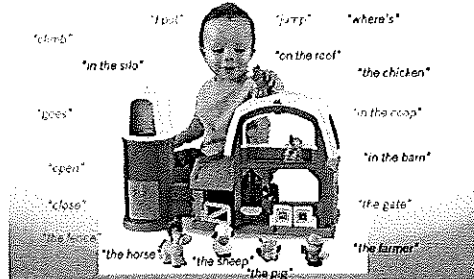
CONCLUSIONS

- Because spontaneous play is joyful, fun, motivating, and can take place anywhere and at anytime in the daily life of children, it is the ideal context in which to infuse symbols to promote communication and language development.

- Just as we should use a developmental approach for targeting language and communication intervention, we should also be using a developmental approach for play interventions. Therefore, careful thought should be given to children's current levels of play in order to help them progress further in each of these domains.

CONCLUSIONS

- For very young children with complex communication needs, AAC provides the voices to express their thoughts and ideas to others. We must support communication, language and play within the context of the child's daily life with parents and siblings.
- So much more to "play"
- So many different ways to "infuse symbols" into play to build language and communication

Acknowledgements

For handouts, visit http://aac.psu.edu

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References

Adamson, L. B., Bakeman, R., & Deckner, D. F. (2004). The development of symbol-infused joint engagement. Child Development, 75, 1171-1187.

Adamson, L. B., Bakeman, R., Deckner, D. F., & Romski, M. A. (2008). Joint engagement and the emergence of language in children with autism and Down syndrome. Journal of Autism and Developmental Disorders, 39, 84-96

Benigno, J. P. & McCarthy, J. W. (2012). Aided symbol-infused joint engagement. Child Development Perspectives, 6, 181-186

Branson, D. & Demchak, M. (2009). The use of augmentative and alternative communication methods with infants and toddlers with disabilities: A research review. Augmentative and Alternative Communication, 25, 274-286.

References (continued)

Drager, K.D.R., Light, J.C., & Finke, E.H. (2009). Using AAC technologies to build social interaction with young children with autism spectrum disorders. In P. Mirenda & T. Iacono (Eds.), AAC for Individuals with Autism Spectrum Disorders (pp. 247-278). Baltimore, MD: Paul H. Brookes Publishing Co.

Karasik, L. B., Tamis-LeMonda, C. S., & Adolf, K. E. (2011). Transition from crawling to walking and infants' actions with people and objects. Child Development, 82, 1199-1209

Liffer, K., Mason, E. J., & Barton, E. E. (2011). Children's play: Where we have been and where we could go. Journal of Early Intervention, 33, 281-295.

Light, J., & Drager, K. (2007). AAC technologies for young children with complex communication need: State of the science and future research directions. Augmentative and Alternative Communication, 23, 204-216.

References (continued)

Romski, M. A., Sevcik, R., & Adamson, L. (1997). Framework for studying how children with developmental disabilities develop language through augmentative means. Augmentative and Alternative Communication, 13, 172-178.

Romski, M., Sevcik, R.A., Barton-Hulsey, A., & Whitmore, A. S. (2015). Early intervention and AAC: What a difference 30 years makes. Augmentative and Alternative Communication, 31, 181-202.

Sigafoos, J., Lancioni, G. E., O'Reilly, M. F., Achmadi, D., Stevens, M., Roche, L., Green, V.A. (2013). Teaching two boys with autism spectrum disorders to request the continuation of toy play using an iPad®-based speech-generating device. Research in Autism Spectrum Disorders, 7, 923-930.

References (continued)

Smith, M. M. (2015). Language development of individuals who require aided communication: Reflections on state of the science and future research directions. Augmentative and Alternative Communication, 31, 215-233.

Wilkinson, K. M. & Light, J. (2014). Preliminary study of gaze toward humans in photographs by individuals with autism, Down syndrome, or other intellectual disabilities: Implications for design of visual scene displays. Augmentative and Alternative Communication, 30, 130-146.