Identifying Musicality within Naturalistic Developmental Behavioral Intervention For Social Communication in Young Children with Autism Spectrum Disorders

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Background

- **Early (social) communication skills** in toddlers with autism are among the strongest predictors of long-term outcomes [1].
- **Naturalistic Developmental Behavioral Interventions (NDBIs)** are **evidence-based** early interventions. NDBIs, which are delivered by clinicians and caregivers, provide developmentally appropriate teaching through interactive social contexts such as play and daily routines.
- NDBIs are considered the **gold standard for supporting social communication skills in young children with autism** [2].
- Music experiences are a universally common form of early social interaction. **Children with autism are often interested in and motivated by music.**
- During and following musical experiences, children with autism may increase social communication and engagement behaviors, including eye contact and turn-taking, joint attention, and vocal production [3].

Theoretical Framework

The **PRESS-Play framework** outlines the **mechanisms of change in music experiences** that **support social communication and engagement** in children with autism. Such mechanisms are **aligned with the core principles of NDBIs**, positioning music experiences as a potential NDBI platform for teaching social communication skills.

PRESS-Play: Mechanisms of Change within NDBI Core Principles

`Predictability	Reinforcement	Emotion Regulation	Shared Attention	Social Play

The Gap

While the PRESS-Play framework outlines the potential of musical experiences as a NDBI platform, little is known about if and how music is operationalized within NDBIs practice.

Research Question

(1) Is music incorporated in NDBI manuals?
(2) How is music/musicality integrated within NDBI practices for supporting the development of social communication skills?

Manuals and Official Abbreviations

ASAP	EMT	ESDM	JASPER	More Than Words
Advancing Social-Communication and Play	Enhanced Milieu Teaching	Early Start Denver Model	Joint Attention Symbolic Play Engagement and Regulation	A Parent's Guide to Building Interaction and Language...

Project DATA	Project ImPACT	RIT	SCERTS	Play to Talk
Developmentally Appropriate Treatment...	Teaching Social Communication...	Reciprocal Imitation Training	Comprehensive Educational Approach...	Practical Guide to Help Your Late-Talking Child...

Methods

- **Qualitative direct content analysis** [4] of 10 widely implemented NDBI clinician and/or parent manuals.
- Data analysis and consolidation of themes conducted by an **interdisciplinary team** including **Speech Language Pathologists, Clinical Psychologist, and Board Certified Music Therapists**.

Deductive Coding (10 predetermined music codes) → **10 NDBI Manuals** (Extraction of text) → **Inductive Theoretical Analysis** (Through the lens of PRESS-Play) → **8 Emergent Themes**

Coding Scheme

Music	Rhythm	Sing	Instrument	Dance
Musical	Pitch	Song	Nursery Rhymes	Finger Play

Results

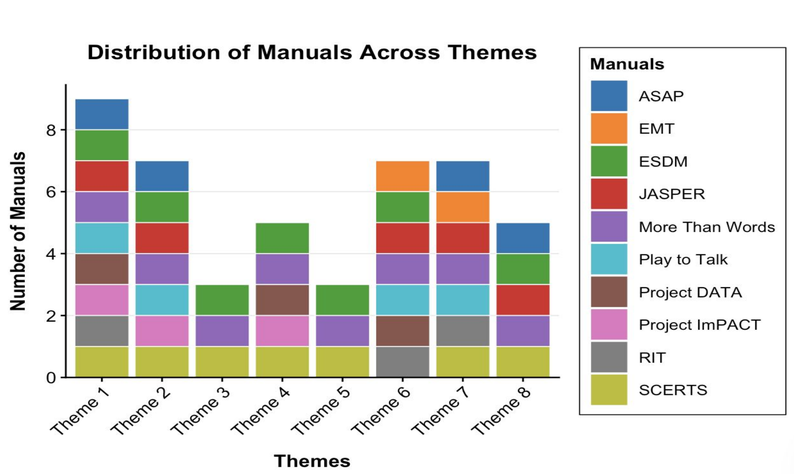

Figure 1. The distribution of manuals across themes.

Themes

Theme 1: Music as a motivator for interaction and turn taking.

Theme 2: Using music to foster social engagement and attention.

Theme 3: Employing predictability and repetition in songs to cue targeted vocabulary and gestures.

Theme 4: Prompting and expanding gesture skills through song.

Theme 5: Employing dynamics and animated singing to cue target words and support learning.

Theme 6: Using music to expand play skills.

Theme 7: Integrating musical instruments in play.

Theme 8: Using songs for cross-domain multi-modal learning.

Discussion

- **Music is manualized into NDBI practice across all 10 widely implemented NDBIs** examined, supporting the claim that music experiences can serve as a potential platform for NDBI practice.
- The **"music as a motivator for interaction and turn-taking"** theme was mentioned repeatedly across 9 manuals, suggesting this approach may be particularly effective in supporting communication of young autistic children. This theme aligns with the Reinforcement principle in the PRESS-Play framework.
- One of the most frequently mentioned themes was **"using music for engagement and attention,"** appearing in 7 manuals. This finding is consistent with scientific literature depicting autistic children's increased engagement in musical contexts. This theme aligns with the Shared Attention and Social Play principles in the PRESS-Play framework.
- Some manuals note musical elements such as pitch and rhythm when discussing components of speech during the delivery of communication interventions.
- Some manuals have caveats for using music, outlining concerns for music becoming a repetitive or stereotyped behavior, over reliance on music for routines, or interfering with natural speech prosody.

Implications

- NDBIs are implemented by various early intervention clinicians, including speech-language pathologists, clinical psychologists, and Board Certified Behavior Analysts. These clinicians may use music as outlined in manualized practice. Research is needed to determine if and how music is an active treatment component.
- **These findings invite clinicians from all disciplines to intentionally incorporate music into their NDBIs practice**, especially to address goals outlined in the themes presented (e.g., recruiting engagement and attention, motivating interaction, etc).
- **Musicality in practice does not only require highly structured music interventions**, as it may include simply singing words, manipulating dynamics, or emphasizing rhythm in speech and play.
- Employing music flexibly may be important for addressing caveats concerned with repetitive behaviors in children with autism (i.e., routinized but not rote).
- Intentionally incorporating music might not be the best fit for every child with autism and for every clinician (e.g., sound sensitivities and certain musical instruments).

Emerging Next Steps

- Actively increasing consideration for how, when, and for whom musicality principles can adapt standard NDBI elements to **maximize gains.**
- Emerging approaches, such as **music-enhanced Reciprocal Imitation Training (meRIT)** intentionally leverage rhythmicity and singing to potentiate RIT elements such as repetition and animated child-directed speech [5].

Limitations

- Partial access to the SCERTS model manual (only one chapter was available).
- Manuals differ in length and level of detail.
- More Than Words includes a full chapter on music with more examples and variations in approaches to use within each theme (e.g., creating novel songs).

References

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