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Case Study of the Little Caterpillars Development Center

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Setting

The group music therapy sessions took place Tuesday and Thursday mornings for 30 minutes in the Green and Blue rooms with one to two teachers in each. Both rooms were equipped with a fridge, a sink, changing tables, cribs and toys. The infant room also had rockers, jumpers, and sitting aids.

Participants

The infants consisted of neurotypical female and male infants from the ages of 6 weeks old to 8 months old. The emerging toddlers consisted of neurotypical male and female emerging toddlers ages 8 months to 14 months. The ethnicities of the participants were Asian, African American, and Caucasian.

Design

A multiple baseline design was used to collect and measure target behavior in both classes. In the infant room three different behaviors were measured (sticking out tongue, blowing raspberries, and saying "mama" or "dada"). For the emerging toddlers class, two different behaviors were measured (moving hands and waving hello or bye).

Baseline Procedures

In the infant room, the measured target behaviors were frequency of sticking their tongue out and blowing raspberries after modeling from the SMT (short term objectives) and frequency of the infants saying "mama" or "dada" after modeling from the SMT (terminal objective).

In the emerging toddler room, the measured target behaviors were the frequency of moving their hands with the SMT modeling waving hello/goodbye (short term objective) and the frequency of correctly waving hello/goodbye with modeling from the SMT.

Methods and Procedures

Nursery rhymes were used for the interventions because they were familiar and developmentally appropriate, due to the simpler contours and smaller intervals. Specifically, *play song-style* nursery rhymes were used due to their ability to help infants focus more externally. *Play song-style* singing is "more clipped, more rhythmic, [and has] more consonants, and more smiling" than the smoother and more airy lullabies that cause infants to direct their attention inwards (Schwartz, 41). The SMT played the songs on the ukulele or sang acappella to provide a gentler, less overstimulating timbre. The music was presented in higher registers to appeal to infants preference for higher pitches as well. For positive social reinforcement, the SMT clapped her hands and said "Great job!"when the infants successfully produced the sounds "mama" or "dada" or waved hello or goodbye.

In the infant room, frequency recording was used to record the percentage of infants who demonstrated the following target behaviors: blowing raspberries, sticking out their tongue, and verbalizing "mama" or "dada" after modeling from the SMT. The musical elements manipulated in the interventions were lyrics, tempo and structure. For example, the SMT would play one verse of the nursery rhyme as written, then would alternate with a piggyback verse consisting entirely of "ma ma ma" or "da da da," because infants remember lyrics more consistently than melody or rhythm. The tempo was intentionally slowed down during the piggyback verse to aid the infants in learning how to produce the sounds. After the piggyback verse, a pause was added to provide an opportunity for the infants to perform the target behaviors (i.e. producing the sounds "mama" or "dada"). Additionally, when singing "mama" or "dada" independently, the SMT sang the first "ma" and the second "ma" at descending minor third intervals to help the infants develop their ability to recognize differences in pitches.

In the emerging toddlers room, frequency recording was used to record the percentage of emerging toddlers who exhibited the following target behaviors: moving their hands and waving hello or goodbye after modeling from the SMT. The non-musical elements that were used were modeling and repetition. During the Hello and Goodbye songs, the SMT modeled waving her hands when singing, "Hello, _____ (client name)" or "Bye, _____ (client name)." Throughout this intervention, the SMT smiled, made eye contact with each child to ensure she had their attention, and sang the musical phrase while waving several times to provide the repetition.

Assessment

The CDC Developmental Milestones were used for the assessment of both classes. Due to range in ages in each classroom, the student music therapist (SMT) focused on the strengths and needs of the majority of each classroom.

The infants' strengths were in the social/emotional and motor/physical milestones. Their needs lay in the cognitive and language/communication milestones.

The emerging toddlers' strengths were in the cognitive and motor/physical milestones. Language/ communication and social/emotional milestones were the greatest needs of this class. Repetition was one of the most effective tools in improving the emerging toddlers' ability to wave hello and goodbye. Oftentimes, the child waved after the fourth or fifth of time of experiencing the intervention.

Because the infants and emerging toddlers are completely dependent on their caregivers for comfort and survival, promoting healthy communication development became the highest need.

Music Therapy Class Goals

Infants: To promote language development, operationally defined as the number of infants who produce the sounds "mama" or "dada" in response to a verbal or modeled prompt from the SMT.

Emerging Toddlers: To promote functional communication, defined as waving hello during the beginning of session or goodbye at the end of the session in response to a verbal or modeled prompt from the SMT.

Terminal Class Objectives

Infants: The class will increase their ability to say "mama" or "dada" from a baseline measurement of 0% of the class saying "mama" or "dada" during a session on September 1, 2022 to a final measurement of 15% of the class saying "mama" or "dada" for two consecutive sessions by November 29, 2022.

Emerging Toddlers: The class will improve their ability to wave hello or goodbye from a baseline measurement of 0% of the class waving hello or goodbye on September 1, 2022 to a final measurement of 30% of the class waving hello or goodbye for two consecutive sessions by November 29, 2022.

Short Term Class Objectives

For Long-Term Objective No. 1:

1. 15% of the class will stick out their tongue or blow raspberries in response to the SMT modeling this behavior by September 29, 2022.
2. 15% of the class will say "mama" or "dada" in response to the SMT modeling this behavior by November 1, 2022.

For Long-Term Objective No. 2:

1. 30% of the class will move their hands in response to the SMT waving hello or goodbye by September 29, 2022.
2. 30% of the class will wave their hands in response to the SMT waving hello or goodbye by November 1, 2022.

Results

The infant class exceeded both short term objectives. By September 29, 2022, 40% of the class stuck out their tongue and by November 1, 2022, 20% of the class blew raspberries and 40% of the class said "mama" or "dada." The infant class also exceeded the requirements of the long-term objective and over 15% of the class said "mama" or "dada" for three consecutive sessions. They were seen for three baselines sessions and 12 treatment sessions. They missed three sessions because they were napping.

The emerging toddler class did not meet the first or second short-term objective. They did not meet the long-term objective either. On November 3, 2022, at least 30% of the class waved hello or goodbye, but this did not occur for two consecutive sessions, which was the second criteria of the long-term objective. The following week only 13% of the class met the target behavior. This class was seen for three baseline sessions and 15 treatment sessions.

The SMT used the SOAP note format to keep track of the clients' progress. She created an audio note when the session ended of the number of clients at the session, how many met the objective, and all information that may be relevant to the clients' progress.

Discussion

When working with the infants and the emerging toddlers, the SMT encountered circumstances that were hindering to the progress of the music therapy goals, but she also experienced encouragement and support from the room teachers that made the music therapy sessions run smoothly. The original child the SMT began working with and created a treatment plan for, graduated to the toddler class after nine music therapy sessions. Because of this and due to the limitations of time, the SMT changed the design to collect and measure target behavior to a case study of the two groups of children she was already working with, instead of following one individual.

The SMT performed additional assessments and created new treatment plans. In the infant room, there was an overlap in the current music therapy goals, as the terminal objectives both focused on developing verbal communication skills. For the emerging toddler classroom, the new objective targeted increased social communication, aimed specifically on improving their ability to wave hello or goodbye. Previously, the majority of the interventions had been designed to improve emotional expression and vocal sound production for the emerging toddlers—not social communication skills. The change in music therapy goal for the emerging toddler class after nine sessions could explain the delay in progress in meeting their short-term and long-term objectives.

The attendance of the infants and emerging toddlers was not always guaranteed, which regularly changed the number of clients in each class and affected the resulting group dynamic. When a client did not attend daycare regularly, there was an adjustment period that often took several days. The SMT's focus became split between working on the class objective during sessions and meeting the acute needs of the crying child.

Additionally, the makeup of the both classrooms changed three times. As the children met developmental milestones, they were moved to the next class level. Twice, the 8 month old infants graduated to the emerging toddlers class and the 14 month old emerging toddlers graduated to the toddler class. After the LCDC created a newborn room, a few members of the infant class left for the new room and resulted in the infant room decreasing from eight infants to three infants. The group dynamic and energy level, as well as developmental capabilities, changed when children joined or left the existing class. The data collected tracked the two classes as two whole entities instead of considering each individual. Because of these factors, the data collected may not accurately access the success of the clients and of the treatment plan.

A wonderful strength about the LCDC was how supportive the teachers were. The teachers frequently participated in singing and modeling target behaviors; they re-arranged the children for the SMT to have the maximum impact; they provided insight into what might be impacting the children; and most importantly, they were caring individuals who always had the best interest of the children. The teachers often mentioned how music therapy sessions noticeably calmed their class and thanked the SMT for coming. Continuing music therapy is recommended for this population. When working with infants and emerging toddlers, SMTs should to play instruments with a soft timbre, such as the ukulele, to avoid overstimulation. When a child is overstimulated, these strategies may help: 1) sing without an accompaniment, 2) repeat favorite songs ("Wheels on the Bus" and Schwartz's "Are You Ready for Music?" were most effective), 3) sing at a softer tone and a lower volume to help soothe the elevated child, and 4) continue the session for the other children. Be aware of the environment and turn off any radios or toys that are distracting. Watch out for infants who can crawl too closely to instruments and use brightly colored picks to prevent potential injury. Working at the LCDC was an educational and heart-warming experience and is highly recommended.