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Song-based interventions for navigating gains in occupational therapy (SING-OT)

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BOSTON UNIVERSITY
SARGENT COLLEGE OF HEALTH AND REHABILITATION SCIENCES

Doctoral Project

**SONG-BASED INTERVENTIONS FOR NAVIGATING GAINS
IN OCCUPATIONAL THERAPY (SING-OT)**

by

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Submitted in partial fulfillment of the
requirements for the degree of
Doctor of Occupational Therapy

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DEDICATION

I would like to dedicate this work to my nieces Alana-Simone Hector and Elizabeth-Rose Tanis who inspired me to create songs when they were toddlers, my twin boys David and Joseph who make me a proud mommy every day, and my loving husband Umar who always has my back and pushes me to be the best version of myself. I also dedicate this work to my former principal at the start of my career who inspired me to do something with the songs. Lastly, this is for my students who bring me joy and remind me of the reason why I sing.

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translated in English from Haitian Creole to *God will take you through*. Finally, to my amazing, rockstar, holding it down spouse, Umar Adams; thank you for “The mirror;” a hard and necessary life lesson in one of the most challenging moments in the program. Thank you for your unwavering support and love. To my boys, David and Joseph, mommy appreciates all the hugs, kisses, laughter, love letters, and attempts to study with me. I hope that I have made you all proud. Thank you for believing in me.

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ABSTRACT

The author examined current literature supporting the use of innovative, music-based interventions to support young children with autism spectrum disorder and other developmental disabilities engage in the things that they want, need, and desire to do. The author introduced Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT), as an innovative, music-based educational intervention program designed to support the engagement, participation, and performance needs of young children with disabilities. SING-OT uses an evidenced-supported, client-centered, and interests and strengths-driven approach. This proposed multi-phase program focuses on improving knowledge on the literature connecting evidence to song-based interventions and providing access to uniquely composed, occupation-inspired songs, that support children's performance and participation needs. Additionally, conducting an initial feasibility study that assesses the effectiveness of task completion in a common personal hygiene and grooming task within the preschool setting was recommended. Future developments extend to improving caregiver health and wellness outcomes through training opportunities. The author provided a comprehensive program evaluation plan that highlights key stakeholders, a proposal for a single-subject study design, and

implications of the program. The SING-OT program can be utilized as (1) an additional intervention tool for practicing occupational therapy practitioners and other professionals, (2) an avenue for interprofessional collaboration, and (3) a vehicle for improving the occupational performance outcomes among young children with disabilities.

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LIST OF ABBREVIATIONS

| | |
|--------------|---|
| ADL | Activities of Daily Living |
| ADOS..... | Autism Diagnostic Observation Schedule |
| ASD | Autism Spectrum Disorder |
| CINAHL | Cumulative Index to Nursing and Allied Health Literature |
| DLS..... | Daily Living Skills |
| DV..... | Dependent Variable |
| IRB..... | Institutional Review Board |
| ISSI | Individual Strengths and Interests Inventory |
| IV | Independent Variable |
| JSTOR..... | Journal Storage |
| MI..... | Multiple Intelligences |
| MT..... | Music Therapist |
| OT | Occupational Therapy/Therapist |
| OTP..... | Occupational Therapy Practitioner |
| PEDI..... | Pediatric Evaluation of Disability Inventory |
| RCT..... | Randomized Controlled Trial |
| rsfMRI..... | Resting State Functional Magnetic Resonance Imaging |
| SING-OT..... | Song-based Interventions for Navigating Gains in Occupational Therapy |
| ZM..... | Ziggurat Model |

GLOSSARY

Activities of Daily Living (ADL): Daily activities related to taking care of one's own body (AOTA, 2020).

Mnemonics/ Mnemonic Tool: Systems or strategies (e.g., verbal, visual, movement-based, musical) that support or increases recall (Gardiner & Thaut, 2016; Knott & Thaut, 2018).

Modified Activity Analysis: A method by which steps of the activity are simplified to support performance and participation.

Occupation: Everyday activities that are personally meaningful to the client (AOTA, 2020).

Occupation-inspired songs: Originally composed songs by an occupational therapist or in collaboration with a music therapist using occupation-based, activity analyses and key musical elements (melody, repetition, etc.) to support young children with engaging, participating, and performing common ADLs.

Performance: Completing part or whole steps of an activity with varying levels of support. May be marked by a positive or negative change in a skill or level of participation. Performance may vary based on individual differences.

School-based ADL Outcomes: An identified area of occupation that interferes with or impedes a student's successful performance within a school-based setting.

Targeted ADL: A selected occupation or personalized daily activity to be supported through song-based interventions.

CHAPTER ONE – Introduction

Chapter 1: Introduction

The Problem

There is a need to improve outcomes in occupational performance related to activities of daily living (ADLs) among preschool children with disabilities. The Centers for Disease Control and Prevention (CDC) reports that one in six children between the ages of three and seventeen are identified with having a developmental or behavioral disability (CDC, n.d.). These disabilities are often not identified until children start school (CDC, n.d.), resulting in missed opportunities for intervention during critical years of development. In the absence of needed intervention, depending on the type and degree of impairment, performance in important ADLs such as toileting may be delayed or not achieved (Gronski & Doherty, 2019; Lee, 2018). When delays are not addressed in early childhood, it may contribute to negative psychosocial outcomes (Gronski & Doherty, 2019).

Common barriers to participation and performance in ADLs include difficulty or delays in cognitive development, motor development, sensory differences, healthcare or medical needs, time, and behavioral difficulties (Nadarajan & Serajul Haq, 2019; Zlomke et al., 2020). In addition, depending on functional limitations associated with their disability, children with autism spectrum disorder (ASD) for example, may require additional support from caregivers or other persons involved in their care (Lee, 2018; Lee et al., 2018). The level of support needed from primary caregivers may result in caregiver stress (Long et al., 2015; Sood et al., 2018).

Children with disabilities may also benefit from modifications to teaching approaches and other environmental supports when engaging in and performing meaningful occupations. Common interventions to teach and support participation in ADLs include modeling, positive reinforcement, verbal instruction, memorization, and visual tools (Kang & Chang, 2019; Nadarajan & Serajul Haq, 2019; Zlomke et al., 2020). However, when disability-related challenges such as cognitive impairment impacts participation and performance, exploring additional intervention approaches may be warranted (Kang & Chang 2019).

Early childhood is a crucial stage to support performance in life's occupations (Frolek & Kingsley, 2020). When young children can successfully engage in their occupations, it contributes to improved overall health and well-being (Laverdure & Beisbier, 2019). Successful participation in ADLs promotes positive outcomes for both the child and caregiver. The child may experience increased confidence and identity whereas the caregiver may experience reduced stress (Bonnel, 2020; Kocabas & Ozeke, 2012; Laverdure and Beisbier, 2019; Sood et al, 2018). Therefore, creating opportunities to promote independence and successful participation in ADLs as well as supporting caregiver well-being will be highlighted in the proposed intervention program.

This doctoral project will focus on children with a diagnosis of autism spectrum disorder (ASD) and other developmental disabilities. According to the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), individuals with ASD are characterized with having impairments in social communication and social interaction that may impact their participation in social, occupational, and other areas (American

Psychiatric Association, 2013). Developmental disabilities consist of a group of conditions that are related to physical, language, learning, and behavioral impairments, thus impacting participation in meaningful occupations (CDC, n.d.).

Addressing the Problem

The literature supports the need to utilize strategies that encourage, motivate, and promote participation in childhood occupations (Flecky et al., 2019; Kang & Chang, 2019). Given individual differences, disability related challenges, and other contextual factors, it may be beneficial to explore additional intervention approaches that support occupational performance (Kang & Chang 2019). For young children, fun and interactive approaches are often recommended to support engagement and participation in daily routines and activities (AOTA, 2013). Kang and Chang (2019) utilized gaming as a motivating way to teach young children with intellectual disabilities handwashing skills. In a qualitative study that utilized music and movement to address motor dyspraxia and social skills among school-aged children with ASD, positive outcomes were reported in several areas including school functioning (Bonnel, 2020). When presented with opportunities to participate in daily occupations in ways that are personally meaningful, young children are likely to maintain engagement during performance (AOTA, 2013; Kocabas & Ozeke, 2012; Potheini & Ogle, 2015).

In early childhood, songs are considered a popular and powerful media to support educational outcomes (Adu & Frimpong, 2018). However, teachers may need support with locating or identifying appropriate songs and other instructional strategies to address the needs of their students (Adu & Frimpong, 2018; Perez et al., 2019). This creates an

opportune window for occupational therapy practitioners (OTPs) to support young children with successfully accessing and engaging in necessary school-based occupations. Within the Occupational Therapy Practice Framework, 4th Edition (OTPF-4), OTPs might address common occupations such as *toileting and toilet hygiene, dressing, feeding, personal hygiene and grooming, education, play, and social participation* within the preschool setting (AOTA, 2020).

The Proposed Intervention: An Overview

Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT) is an educational intervention program that will develop, provide access to, and utilize occupation-inspired songs in the form of activity analyses to support performance outcomes in school-based occupations, among preschool children with ASD and related developmental disabilities. The program will launch in three phases. Phase 1 will consist of a web-based resource to educate and inform OTPs and other school-based professionals on the evidenced-based use of songs and provide access to originally composed occupation-inspired songs. Caregivers are not the primary audience during this phase. However, they will also have access to this web-based resource for informational purposes. Phase 2 will involve an effectiveness study where one song will be selected to address performance in a common personal hygiene and grooming task within the preschool setting. Lastly, Phase 3 will support parents and caregivers of children with disabilities through collaborative caregiver trainings to improve their child's participation and performance in ADLs and other childhood occupations. This dissertation will focus on Phases 1 and 2 of program development.

It is important to note that OTPs utilize music in other contexts such as through music listening therapies that are usually delivered through specialized headphones (Vargas & Lucker, 2016; Wilbarger & Frick, 2017). Through SING-OTs occupation-inspired songs, OTPs working with preschool children with disabilities may create opportunities to promote motivation, improve level of engagement and enjoyment, and evidently improve performance during ADLs. Contrary to these music and sound-based intervention approaches, the SING-OT program will utilize evidenced-supported songs with key musical elements that are sung live while the child or student engages in the targeted ADL task, without the use of specialized headphones. The SING-OT program aims to promote and demonstrate the value of song-based interventions to support participation and performance in meaningful occupations among young children with disabilities.

Fostering Interprofessional Collaboration

It is important to utilize a collaborative approach when supporting the needs of children with disabilities (Laverdure & Beisbier, 2019). Interprofessional collaboration involves two or more professionals working together to achieve common and mutually agreed upon goals (Green & Johnson, 2015). The SING-OT program aims to encourage interprofessional collaboration between OTPs, teachers, caregivers, and music-based professionals such as licensed music therapists (MTs). Perez et al. (2019), indicate that teachers often seek out strategies to support occupational performance in ADLs. Positive caregiver outcomes can be achieved through the collaborative relationship between OTPs and caregivers (Gronski & Doherty, 2019). The program will also provide opportunities

for student participants to be involved in the collaborative process. For example, they will have the opportunity to participate in the decisions regarding the song-based interventions that will be utilized to support them.

Cohn et al. (2017) highlighted the client-centered benefits of the collaborative relationship between OTPs and MTs. A key stakeholder in the SING-OT program will be music therapists (MT). MTs may potentially serve as valuable team members for the OTP who desires to utilize song-based interventions. The American Music Therapy Association (AMTA) defines music therapy as the “clinical and evidenced-based use of music interventions to accomplish individual goals” (AMTA, 2015, Scope of music therapy practice section, para. 3). Through the *therapeutic use of music* and music-related interventions, MTs may implement receptive music listening, song writing, singing, music performance, music-assisted relaxation, music-based education, adapted music, and other approaches (AMTA, 2015).

Similarly, OTPs utilize evidence supported, client-centered approaches to achieve occupational outcomes for individuals, groups, and populations across the lifespan. According to the Occupational Therapy Practice Framework, 4th Edition (OTPF-4), OTPs utilize the *therapeutic use of occupations* to support performance by enhancing or enabling participation (OTPF, 2020). Collaboration amongst OTPs and MTs might encourage the sharing of unique perspectives, training, and clinical expertise while supporting young children with disabilities through song-based interventions.

CHAPTER TWO – SING-OT Theoretical and Evidence Base

Chapter 2: Theoretical and Evidence Base to Support the SING-OT Program

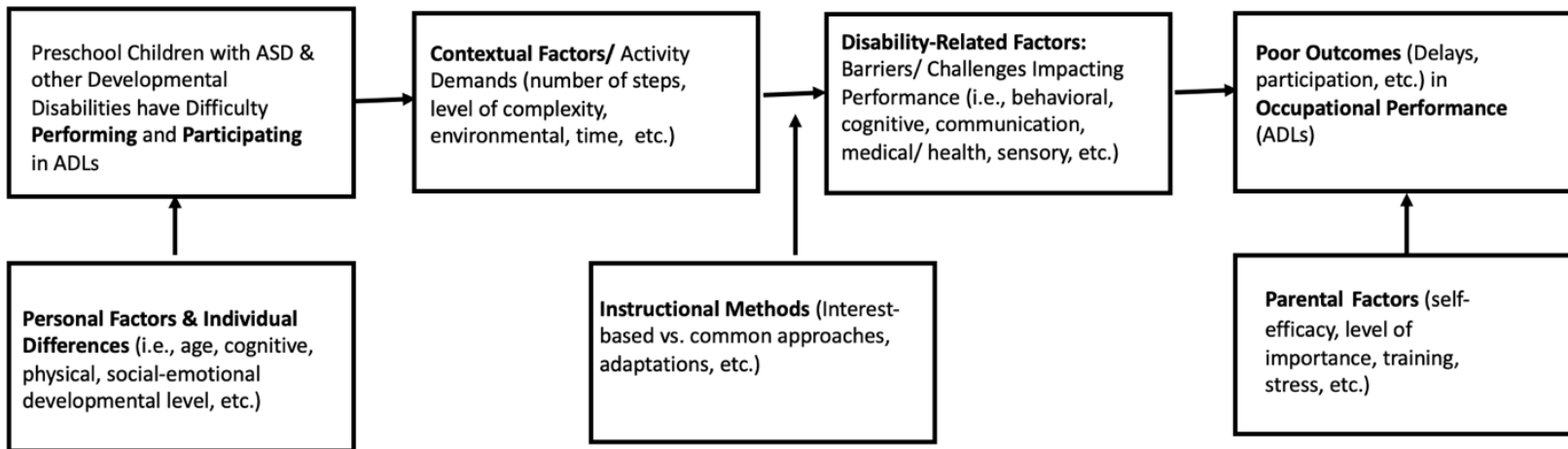
Overview of the Problem

Children with ASD and other developmental disabilities may encounter difficulties with performing and participating in basic and instrumental activities of daily living (Gronski & Doherty, 2019; Lee, 2018). Difficulty performing tasks related to caring for oneself, for example, may result in negative outcomes for the child and caregiver (Gronski & Doherty, 2019; Lee, 2018; Lee et al., 2018; Long et al., 2015; Sood et al., 2018). Therefore, designing interventions that are geared towards improving these outcomes are important (Bonnel, 2020; Kocabas & Ozeke, 2012; Laverdure and Beisbier, 2019; Sood et al, 2018).

Drawing from two strengths-based, theoretical frameworks that consider the child's individual strengths and interests (The Ziggurat Model and Theory of Multiple Intelligences), the SING-OT program is an educational intervention program that proposes to utilize song-based interventions to improve occupational performance outcomes (*the problem*) among preschool children with ASD and similar disabilities (Armstrong, 2017; Aspy & Grossman, 2011; Gardner & Hatch, 1989). Occupational performance refers to the successful completion or accomplishment of a selected occupation (AOTA, 2020). Outcomes are the product or result(s) a client might achieve through occupational therapy interventions (AOTA, 2020). The explanatory model presented in Figure 2.1 illustrates evidence-supported mediators and moderators within the causal pathway of the problem.

Figure 2.1

Explanatory Visual Model of the Problem



Within the explanatory model of the *problem*, a child's performance and participation in ADLs are influenced by several factors. An example of a mediating factor that directly influences participation and performance outcomes are contextual factors such as the environment, task demands including the sensory features of a given task, and other challenges. Disability-related factors refer to specific barriers or challenges that a child may experience due to their disability. For example, children with ASD experience difficulties related to social communication (American Psychiatric Association, 2013). Therefore, instructional or intervention methods (moderators) that specifically target communication and other disability-related barriers for this population may be helpful.

Additional moderating factors that impact ADL performance outcomes include personal factors such as age and parental factors such as stress among caregivers or others involved in primarily caring for the individual. Intervention approaches that consider how these mediating and moderating factors impact a child's performance may potentially improve outcomes for young children with ASD and other developmental disabilities.

Theoretical Framework

The Ziggurat Model (ZM) and Howard Gardner's theory of Multiple Intelligences (MI) were used to inform the proposed intervention program. The ZM was developed by Ruth Aspy and Barry Grossman as a process and framework for designing individualized and comprehensive interventions for individuals with ASD (Aspy & Grossman, 2011). The development of Howard Gardner's theory of MI proposed a perspective shift in measuring human intelligence. Gardner encouraged measuring human ability beyond

intelligence testing through the consideration of multiple domains (*intelligences*) and how factors such as culture, context, and the environment might shape and define human ability (Almeida et al., 2010; Armstrong, 2017; Gardner & Hatch, 1989). These frameworks were selected based on their similarities in the view of the person, influence of the environment, and relation to the proposed SING-OT program.

View of the Person

The ZM supports examining specific characteristics that are said to help us understand how to support individuals with ASD (Aspy & Grossman, 2011). A major proposition within the ZM suggests, comprehensive interventions that aim to address the needs (*problem*) of individuals with ASD, require an understanding of the *underlying characteristics* that define the diagnosis (Aspy & Grossman, 2011; Smith et al., 2010; Smith Myles et al., 2011). Additionally, the ZM utilizes a strengths-based approach. For example, the *Individual Strengths and Interests Inventory* (ISSI) is an assessment that can be used to help identify *individual strengths* and *interests* within multiple domains (Aspy & Grossman, 2011). Domains within the *ISSI* include (1) Social, (2) Behavior, Interests, and Activities, (3) Communication, (4) Sensory, (5) Cognitive, (6) Motor, (7) Emotional, and (8) Biological (Aspy & Grossman, 2011; The Ziggurat Group, n.d.). See Appendix A. There is also a focus on individuality (Aspy & Grossman, 2011; Wilkerson, 2015). People are believed to have individual differences (including strengths) that influence the process of change (Aspy & Grossman, 2011; Smith Myles et al., 2011; Wilkerson, 2015). Individual differences are the unique traits and characteristics that distinguishes individuals from others (American Psychological Association, n.d.).

Similar to the ZM, the theory of MI supports a strength-based approach while recognizing individual differences (moderators). Gardner's theory of MI views the person as having multiple resources or *intelligences* that contribute to growth (Armstrong, 2017; Gardner & Hatch, 1989). The eight intelligences within MI are: (1) *Linguistic*, (2) *Logical-Mathematical*, (3) *Spatial*, (4) *Bodily-Kinesthetic*, (5) *Musical*, (6) *Interpersonal*, (7) *Intrapersonal*, and (8) *Naturalist* (Armstrong, 2017). A major proposition within this theory implies that individuals have the potential to grow or develop in any or all the intelligences (Armstrong, 2017; Gardner & Hatch, 1989). In other words, we all have the capacity to change when provided with the optimal external or environmental supports (*encouragement, enrichment, instruction*) and when supported in areas of strength (Armstrong, 2017). Both frameworks promote a holistic view of the person as they not only focus on the problem such as limitations associated with an individual's disability but the influence of contextual factors when addressing the problem.

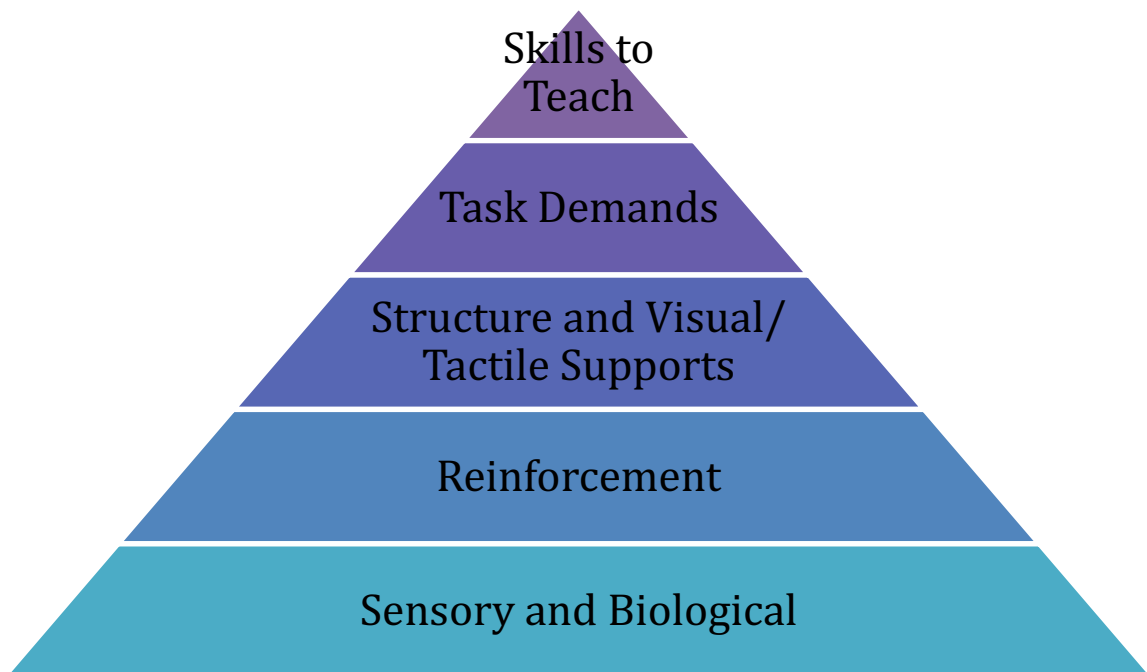
Influence of the Environment

The ZM and theory of MI seek to promote an understanding that the *environment* influences change (Armstrong, 2017; Aspy & Grossman, 2011; Gardner & Hatch, 1989). For example, the ZM describes how the environment can be modified (i.e., activity demands; barriers/challenges) to promote positive outcomes in behavior or support occupational performance (Aspy & Grossman, 2011). The *Intervention Ziggurat* is a hallmark of the ZM. It consists of a five-level hierarchical guideline that provides the basis for developing interventions. It starts at the *Sensory and Biological* level where internal factors impacting performance are addressed, then moves to external factors such

as in *Structure and Visual/ Tactile Supports*. This is where environmental modifications are provided to support performance. Lastly, the structure ends at *Skills to Teach* at the top of the pyramid, where interventions are geared towards addressing specific skills (Aspy & Grossman, 2011). See Figure 2.2 for an adapted illustration of this model.

Figure 2.2

Intervention Ziggurat: A 5-Level Hierarchy for Developing Comprehensive Interventions



Note. Intervention Ziggurat. Adapted from The Ziggurat Model (Aspy & Grossman, 2011).

Like the ZM, the theory of MI considers strategies to support performance within each of the *intelligences* (Armstrong, 2017). For example, children who demonstrate *Bodily-Kinesthetic Intelligence* may benefit from the use of ball chairs whereas visual schedules may be helpful for those who demonstrate *Spatial Intelligence* (Armstrong, 2017).

Therefore, recognizing the impact of contextual (personal and environmental) factors on occupational performance will be addressed in the proposed intervention.

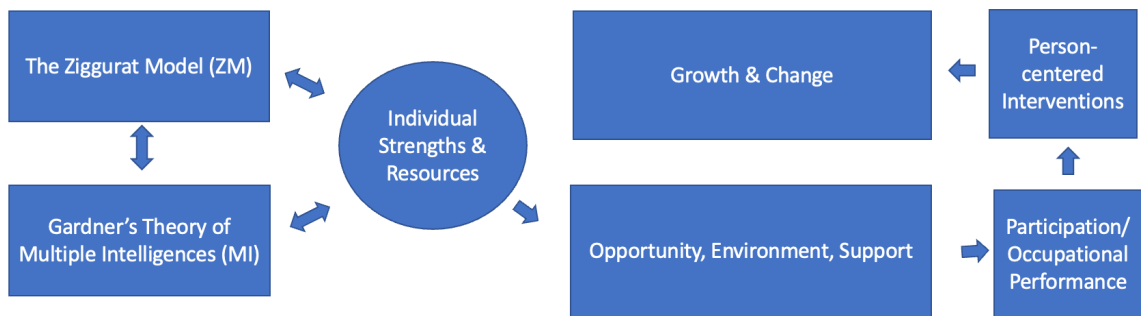
Relation to Doctoral Project

Within the causal pathway of the *problem* in Figure 2.1, there is consideration for how individual differences (moderator) influence change. Contextual and disability-related factors are considered in both theories. Lastly, structuring instructional methods (moderator) to meet individual needs such as through music-supported interventions will be a focus of the SING-OT program.

SING-OT proposes to develop child or student-centered, comprehensive interventions that are driven by individual strengths and interests to address deficits or delays in occupational performance related to school-based ADLs. Collectively, The Ziggurat Model and theory of Multiple Intelligences supports the problem and goals of the proposed song-based intervention program. Figure 2.3 provides a visual summary of key theoretical concepts.

Figure 2.3

Summary of Key Concepts of MI and ZM in Relation to the SING-OT Program



In this visual description, both theories recognize that individuals have strengths and internal resources (i.e., capacity) that enables them to grow and change. It is important to understand the needs of the individual that are associated with their disability. However, the focus is not primarily on the limitations but on how factors such as opportunity (i.e., access), the environment (i.e., instruction), and other external supports might influence participation and performance in meaningful occupations. These theoretical frameworks support how individualized, diverse, and person-centered interventions may lead to the successful performance and participation in life's occupations (growth and change).

Examining the Evidence

A literature search was conducted to identify evidence on barriers impacting participation and performance outcomes in ADLs among young children with ASD and other developmental disabilities. The author searched current literature to address the following clinical question: *For children with autism spectrum disorder (ASD) and other developmental disabilities, is there evidence that behavioral challenges and other barriers (e.g., cognitive, sensory, etc.) contribute to poor outcomes or delays in occupational performance?*

Summary of the Evidence Base

Database searches included CINAHL, PubMed, and Google Scholar. Limits were set to include full text, peer-reviewed articles published between 2016-2021, and in the English language. Additional limits such as a primary diagnosis of ASD and age (younger children starting at age two) were set to narrow search results. Key terms

included: *adaptive skills, young children AND autism; daily living skills or functional skills AND autism or ASD; autism spectrum disorder AND young children or early childhood or preschool or kindergarten or early years; adaptive skill outcomes AND young children with autism; adaptive behavior training AND children with autism; daily living skill challenges or problems AND children with autism; problem behavior outcomes AND children with developmental disabilities; poor adaptive skill childhood outcomes AND developmental disabilities; behavioral outcomes AND children with autism or ASD or autism spectrum disorder; activities of daily living or ADL or dressing or bathing, feeding, hygiene, toileting AND barriers or obstacles or challenges.* Initial search results yielded between 36 to 16,000 articles. With search limits implemented, fourteen articles were selected for review based on relevancy to the clinical question and six will be discussed in this literature review.

Clinical Bottom Line

Collectively, findings from the selected studies suggested several factors that impacted outcomes in occupational performance related to ADLs. In this review, ADL is used synonymously with daily living skills (DLS). Behavioral challenges were mentioned but not emphasized as primary factors when compared to disability-related, and environmental factors that influenced participation. More specifically, autism severity, social-emotional abilities, age at diagnosis, developmental level, and communication skills were identified as primary barriers (Chien et al., 2017; Di Rezze et al., 2019; Green & Carter, 2014). Other factors included cognitive ability, fewer siblings, sensorimotor

impairments, and the child's response to sensory input (Chien et al., 2017; Eicher et al., 2018; Green & Carter, 2014; Pfeiffer et al., 2017).

Additionally, non-child related factors such as parent/ caregiver training, parental stress, parental perceived level of self-efficacy, and perceived level of importance of a given ADL influenced performance and participation in DLS (Chien et al., 2017; Pfeiffer et al., 2017; Scahill et al., 2016). In a randomized controlled study that examined the impact of parent training on adaptive behavior among parents of children with ASD and disruptive behavior, parent training was found to result in a positive significant change in daily living skill performance ($P = .004$, Effect size = 0.36) (Scahill et al., 2016).

Similarities and Differences

Studies were similar in relation to their targeted foci regarding participation in daily activities (Chien et al., 2017; Di Rezze et al., 2019; Eicher et al., 2018; Green & Carter, 2014; Pfeiffer et al., 2017; Scahill et al., 2016). However, each one differed in design, methodology, participants, and major findings. The sections below will outline key similarities and differences from the literature.

Design and Methodology

This review consisted of a combination of qualitative, descriptive, and randomized control trial designs. Methodologies included semi-structured caregiver interviews, questionnaires (formal and informal), and the use of standardized assessments (e.g., Vineland 2, Mullen Scales of Early Learning, Autism Diagnostic Observation Schedule (ADOS), etc.). To increase rigor, one study utilized several formal parental questionnaires and reported on their psychometric properties (Chien et al., 2017). Across

half of the studies, the Vineland Adaptive Behavior Scales was used to measure changes in DLS (Di Rezze et al., 2019; Green & Carter, 2014; Scahill et al., 2016).

Population

Study populations primarily included young children at the preschool age range. This supports the clinical question and proposed intervention program. However, one study utilized younger children as early as 18 months (Green & Carter, 2014). Four out of the six studies considered participants with a primary diagnosis of ASD (Di Rezze et al., 2019; Green & Carter, 2014; Pfeiffer et al., 2017; Scahill et al., 2016). Whereas three of the six studies included other developmental and similar disabilities such as sensorimotor impairments, PDD-NOS, intellectual disabilities, developmental delay, and language/speech delay (Chien et al., 2017; Eicher et al., 2018; Green & Carter, 2014).

Findings

In every study examined, participation in ADLs was impacted by more than one factor. For example, most studies cited personal factors such as communication, social emotional abilities, sensorimotor impairments, age, developmental level, autism severity, and behavior as primary barriers impacting performance in ADLs (Di Rezze et al., 2019; Eicher et al., 2018; Green & Carter, 2014; Scahill et al., 2016). Whereas others identified environmental factors such as the sensory environment of a given activity, parental expectations, parental self-efficacy, parental stress, and the number of siblings, as significant factors to participation (Chien et al., 2017; Pfeiffer et al., 2017; Scahill et al., 2016). In a study that examined participation among children with moderate to severe developmental disabilities, participation was influenced by family structure (Chien et al.,

2017). Children with fewer siblings were found to engage in more activities than those with more than one sibling (*Participation diversity*, $p < .001$) (Chien et al., 2017).

Although there were contrasting findings regarding the impact of personal and contextual factors affecting participation and performance in ADLs, this review provides a comprehensive overview of the complex challenges in which individuals with disabilities encounter when engaging in meaningful occupations.

Quality and Limitations of Current Research

The body of evidence supported the clinical question. Two of the six studies employed longitudinal designs to answer the second part of the clinical question that explored children's performance in ADLs over time (Di Rezze et al., 2019; Green & Carter, 2014). Di Rezze et al. (2019) examined daily living skill trajectories among preschool children which is most closely related to the targeted population of the proposed intervention program.

Despite the current evidence in support of the clinical question, several limitations exist across all studies. Examples included data loss among longitudinal designs, attrition, location (i.e., geographic areas, clinic vs. naturalistic settings), and limited diversity among participants. Other limitations are contrasting conclusions regarding which factors most predicted and impacted occupational performance in DLS. For example, in studies that examined predictors of daily living skills, one study found that daily living skill standard scores decreased or improved at a much slower rate than the norm (Green & Carter, 2014), whereas another found an increase in performance over time (Di Rezze et al., 2019). Therefore, it is suggested that caution be taken when using repeated measures

of a standardized assessment to determine changes in ADL performance, as this may result in reduced sensitivity to change over time (Di Rezze et al., 2019). Lastly, the level of evidence based on the study design, variations in sample size, and absence of comparison groups in most studies may impact the external validity and application of findings. Therefore, caution is also suggested when implementing findings with different populations from the ones reviewed and with clients in varying geographic locations or settings.

Recommendations

Overall, findings suggested that a combination of personal and environmental factors may impact current and future participation and performance in ADLs among young children with ASD and similar disabilities (Chien et al., 2017; Di Rezze et al., 2019; Eicher et al., 2018; Green & Carter, 2014; Pfeiffer et al., 2017; Scahill et al., 2016). Clinicians utilizing this evidence should consider all factors when developing interventions that aim to support performance in ADLs. While personal and disability-related factors significantly influence participation, environmental and parental factors are key components in intervention planning. The clinician should prioritize the child's individual strengths, interests, needs, as well as the environment with which they are expected to perform these occupations.

OTPs, other clinicians, and care providers working with children with ASD and similar disabilities, including sensorimotor difficulties and moderate to severe developmental disabilities, may use this information to inform clinical decisions when developing client-centered and collaborative interventions, while bearing in mind the

many factors that influence participation and performance in meaningful occupations.

Finally, OTPs should provide opportunities to engage families through parent/caregiver trainings to best support their child's performance and participation in ADLs across various settings.

CHAPTER THREE – Overview of Current Approaches and Methods

Previous Attempts to Address the Problem

Research supports the use of music-based and music-supported interventions to address occupational participation and performance among young children with ASD and other developmental disabilities (*problem*) (Busse et al., 2018; Paul et al, 2015; Sanglakh Goochan Atigh et al., 2017; Schwartzberg & Silverman, 2013; Sharda et al, 2018; Simpson et al, 2013). The author conducted a literature search to identify evidence examining music or song-based interventions for supporting young children with disabilities while engaging in meaningful activities of daily living (ADL).

Search Question

How well does song-based instruction compare with other instructional methods (e.g., visuals, verbal, video, etc.) to promote occupational performance in ADLs among preschool children?

Summary of the Evidence Base

The following databases and search engines were utilized to locate relevant evidence: CINAHL, JSTOR, and Google Scholar. Key words included: *music therapy or music intervention OR music therapy and learning outcomes or learning effectiveness or education or educational outcomes AND autism or asd or autism spectrum disorder or asperger's or asperger's syndrome or autistic disorder or aspergers; teaching strategy outcomes AND daily living skills; song-based interventions AND daily living skills; music interventions for improving dressing skills for children with autism; song-based interventions and developmental disabilities; activities of daily living AND instructional*

strategies or best practices or teaching methods; and *preschoolers with autism AND songs*. Limits were set to include journal articles and reviews published in the English language, within the last 10 years (2012–2021). In some instances, additional limits included age ranges from ages two to five, but this restricted the search results. Search results yielded between two to over 1,000 articles depending on the source. After a review of abstracts, 17 articles were examined and six were selected for this synthesis.

Clinical Bottom Line

Findings from the selected studies support the use of music and other instructional strategies to promote occupational performance among young children with disabilities. The evidence did not explicitly address ADLs, but targeted other relevant childhood occupations such as *education, play, and social participation* (AOTA, 2020). In addition, a few studies explored performance skills (motor skills) and social interaction skills. While there is considerable evidence addressing ADLs through non-song-based interventions (e.g., video prompting, most-to-least prompting, etc.), this synthesis will focus on studies that explicitly examined the effectiveness of song and music-based interventions in comparison to other conditions or teaching strategies to support performance in meaningful occupations.

Several studies examined the effectiveness of song-based interventions, thus supporting the search question and proposed SING-OT program (Busse et al., 2018; Paul et al, 2015; Schwartzberg & Silverman, 2013; Sharda et al, 2018; Simpson et al, 2013). Some studies demonstrated positive outcomes in support of song and music-based interventions over other teaching methodologies (Paul et al., 2015; Sanglakh Goochan

Atigh et al., 2017; Sharda et al., 2018; Simpson et al., 2013). Whereas others found sung and spoken methodologies to be either equally effective or demonstrated variability (Buse et al., 2018; Schwartzberg & Silverman, 2013).

Collectively, the evidence suggested positive results when music and song-based interventions were used to promote engagement and participation in meaningful occupations (Paul et al., 2015; Sanglakh Goochan Atigh et al., 2017; Sharda et al., 2018; Simpson et al., 2013). Due to variability in performance, songs and music-based interventions were suggested to be used in conjunction with other teaching strategies (e.g., movement-based). Factors that contributed to variability included individual differences and personal, cultural, and contextual factors (Busse et al; 2018; Paul et al., 2015; Schwartzberg & Silverman, 2013; Sharda et al., 2018; Simpson et al., 2013).

Occupational therapy practitioners (OTPs) who aim to develop engaging and client-centered interventions using songs or music should evaluate how the above factors may impact the intended outcomes. Lastly, OTPs who decide to use this evidence may strengthen their interventions by exploring recent and developing neuroscience research using music-based interventions to demonstrate improved social communication and functional brain connectivity among young children ages six to 12 with ASD (Sharda et al., 2018).

Similarities and Differences

Primary similarities were related to the intended population and major findings in the research. In most studies, participants had a formal diagnosis of ASD and were children between the ages of three and 21 (Paul et al, 2015; Schwartzberg & Silverman,

2013; Sharda et al, 2018; Simpson et al, 2013). Two of the studies specifically targeted the intended preschool age group for the proposed SING-OT program (Paul et al, 2015; Simpson et al, 2013). Sharda et al. (2018) examined multiple factors when using music-based interventions. Through formal and objective neuroimaging (rsfMRI) measures, authors found positive and statistically significant results in functional brain connectivity ($P < .0001$) post-intervention, in participants who were in the music group (Sharda et al., 2018). Furthermore, participants in the music group made improvements in social communication (medium effect size $d = 0.34$) and parent-reported quality of life (positive effect $d = 0.57$) (Sharda et al., 2018).

In another study comparing the effectiveness between sung and spoken instructions to improve social functioning among preschool children ASD, authors found higher socio-communicative responses (i.e., frequency of social gesture and eye contact), among participants in the experimental sung group when compared to the spoken group (Paul et al., 2015). Lastly, Sanglakh Goochan Atigh et al. (2017) examined the effectiveness of music-based interventions on motor performance for school aged children (ages 7-14) with ASD. These authors found statistically significant outcomes in targeted motor areas among participants in the music group (*balance*: $P < 0.001$, *bilateral coordination*: $P < 0.05$, *upper limb coordination*: $P < 0.001$).

Primary differences included study design, sample size, and methodology. Studies ranged from single-subject AB designs to randomized controlled trials, and quasi-experimental designs. Four of the six studies were randomized controlled studies (Sanglakh Goochan Atigh et al., 2017; Schwartzberg & Silverman, 2013; Sharda et al,

2018; Simpson et al, 2013). After attrition, sample sizes varied between three and 52 participants. Measures ranged from formal rating scales (i.e., *Beach Family Quality of Life Scale-FQoL*) to standardized assessments (i.e., *Vineland Adaptive Behavior Scales*, *Short Sensory Profile*, *Peabody Picture Vocabulary Test-PPVT-4*). Participants were recruited from schools, non-school based community settings, and through convenience sampling from larger studies. In a recent RCT study examining the effect of music and movement activities on motor performance, an occupational therapist was selected as a blind assessor (Sanglakh Goochan Atigh et al., 2017). Blinding of assessors during interventions helps to strengthen the internal validity of a study.

Quality and Limitations of Current Research

Overall, the evidence supports the use of songs and music-based interventions when used in isolation or in combination with other teaching methodologies among children with ASD and language learning needs. The RCT study design employed by most authors demonstrates a higher level of evidence. This may potentially contribute to increased confidence while using this evidence to develop interventions for this population. Study methodology also provided both formal and objective means to assess pre and post intervention performance. This helps to minimize rater bias and strengthen internal validity.

Though the evidence supported the intended intervention program and search question, there are key limitations which may impact generalizability of findings. In almost all studies, attrition occurred either during the recruitment process or intervention phases. This contributed to smaller sample sizes. Intervention durations varied between

three days and 24 weeks, with only three studies showing a positive effect between eight and twelve weeks (Paul et al., 2015; Sharda et al., 2018). Two out of the six studies targeted the intended age group for the proposed program (Paul et al., 2015; Simpson et al., 2013). Therefore, one might anticipate variability of performance when interventions are implemented with older children. Lastly, various factors such as personal, cultural, environmental, interest, and preferences, may implicitly contribute to variability of participant performance and impact study outcomes.

Recommendations

The evidence suggests that song and music-based interventions (with songs) are beneficial when teaching and supporting children on the autism spectrum. When utilizing the evidence to inform practice or interventions, it is important to consider all factors impacting performance as well as the study limitations. The clinician is encouraged to consider objective measures to determine changes in performance. Collaboration among team members who support individuals within this population is also important. For example, the valuable input from parents and caregivers (Sharda et al., 2018) and the clinical expertise of licensed music therapists and speech and language pathologists may help to strengthen the intervention design. Lastly, since music serves as an intrinsically motivating factor for some individuals with ASD (Sharda et al., 2018), it may be helpful to identify client interests and preferences when developing song and music-based interventions to support performance in meaningful occupations.

CHAPTER FOUR – Description of the Proposed Program

Basis of the Program and Intervention Approach

Since children with autism spectrum disorder (ASD) may experience difficulties when participating and performing their activities of daily living (ADL) (Gronski & Doherty, 2019; Lee, 2018), interventions that support engagement in meaningful and necessary childhood occupations are worth exploring in order to determine effective means of improving outcomes in this arena. In doing so, occupational performance needs may be addressed while improving health and wellness outcomes (Laverdure & Beisbier, 2021). Occupational therapy practitioners (OTPs) are skilled in creatively designing client-centered interventions that support their client's values, interests, needs, and strengths (AOTA, 2020).

The Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT) program's strengths and interest-based theoretical frameworks (Armstrong, 2017; Aspy & Grossman, 2011), supports utilizing intervention approaches that promote active involvement and provide children with access and opportunities to experience learning in various ways. The program will use a music-based approach to support the occupational performance needs of young children with disabilities. It will provide OTPs and similar professionals with evidenced supported songs, as therapeutic tools that they may consider when supporting their young clients during important activities of daily living.

Music-based interventions have been extensively researched and used to support individuals within various client populations (Bolduc & Lefebvre, 2012; Bonnel, 2020;

Cohn et al., 2017; Gardiner & Thaut, 2016; Knott & Thaut, 2018; Paul et al., 2015; Sanglakh Goochan Atigh et al., 2017; Sharda et al., 2018; Simpson et al., 2013; Tamminen et al., 2017). However, limited research explicitly examines the effectiveness of music-supported interventions to address ADLs among young children with ASD and similar disabilities. The SING-OT program aims to address this gap in the literature, in hopes of encouraging more OTPs to utilize creative and occupation-centered approaches, such as through music (songs), when supporting their young clients with disabilities.

SING-OT will utilize music as a mnemonic tool or device that young children may access while participating and performing their school-based ADLs. Mnemonics are systems or strategies (e.g., verbal, visual, movement-based, musical) that support or increases recall (Gardiner & Thaut, 2016; Knott & Thaut, 2018). The SING-OT program will incorporate *musical mnemonics* through songs that addresses occupational performance. Key approaches and musical elements will include short phrasing, rhythm, simple melodies, and repetitive components. Additionally, lyrics will be composed in the form of modified activity analyses with the intent of chunking or reducing the amount of information that a child must recall into pleasing, motivating, and easy to remember songs (Gardiner & Thaut, 2016; Thaut et al., 2014). For example, a child who is learning how to tie their shoelaces may need to remember multiple steps (procedural memory). However, if the same steps were simplified and structured into a musical format (*musical mnemonics*), the child may be more successful at not only remembering but performing the task.

In addition, the program will highlight the value of student voice through its

online educational resources. For example, child-friendly likability scales and learning preference inventories will be available to enable young children to participate in the intervention process, through sharing of feedback, communicating their needs, and identifying their individual strengths and interests. Using an innovative, occupation-inspired, and person-centered intervention approach, the SING-OT program aims to utilize songs to promote learning, participation, and performance in meaningful occupations among young children with disabilities.

Program Practice Scenario

Table 4.1

Case Scenario describing the impact of song-supported interventions in a preschool classroom.

Case Scenario

Avery is a 3-year-old preschool student with autism. He enjoys music and is often observed humming, dancing, tapping his feet, and moving. His teachers are concerned about how to engage him in the occupations that are a part of his classroom routines. For example, when it's time to wash his hands before snack, Avery often becomes overwhelmed and has difficulty transitioning to the sink to wash his hands. His teacher consults with an occupational therapist (OT) who spends time observing Avery in the classroom to identify where he is having difficulty. The OT later suggests using a strengths and interest-based approach such as through music or songs to support Avery with transitioning and performing his classroom routines (AOTA, 2013). The OT

decides to create a short, originally composed song in the form of an activity analysis to help Avery wash his hands. The song contained a familiar melody, simple lyrics, and other unique musical elements to support his performance (Bulduc & Lefebvre, 2012; Knott & Thaut, 2018; Schwartzberg & Silverman, 2014; Sena Moore & Hanson-Abromeit, 2015; Thaut et al., 2014; Tillmann et al., 2014; Vaiouli & Ogle, 2015). Shortly after the song was introduced, Avery appeared to enjoy learning it and seemed more engaged while participating in grooming tasks within his classroom. Interest and strengths-driven songs are helping Avery to succeed in school. What if all students had access to songs that would help them perform important and necessary school-based occupations?

Key Features of the SING-OT Program

SING-OT is an educational intervention program designed to support preschool children with disabilities with participating and performing necessary school-based ADLs. The program intends to provide OTPs, related school-based professionals, and evidently caregivers with access to evidence supported occupation-inspired songs and resources for supporting young children with ASD and related disabilities participate in their childhood occupations. SING-OT's educational and music-based resources will be accessible via an online platform (website).

Program Objectives

The primary objectives of the SING-OT program are to:

- Provide access to originally composed, evidenced-supported, occupation-inspired songs through an online educational and resource platform for OTPs and similar professionals who are interested in utilizing song-based interventions with young children with disabilities.
- Promote positive student school-based outcomes (*gains*) in meaningful occupations (i.e., ADLs) through occupation-inspired songs.

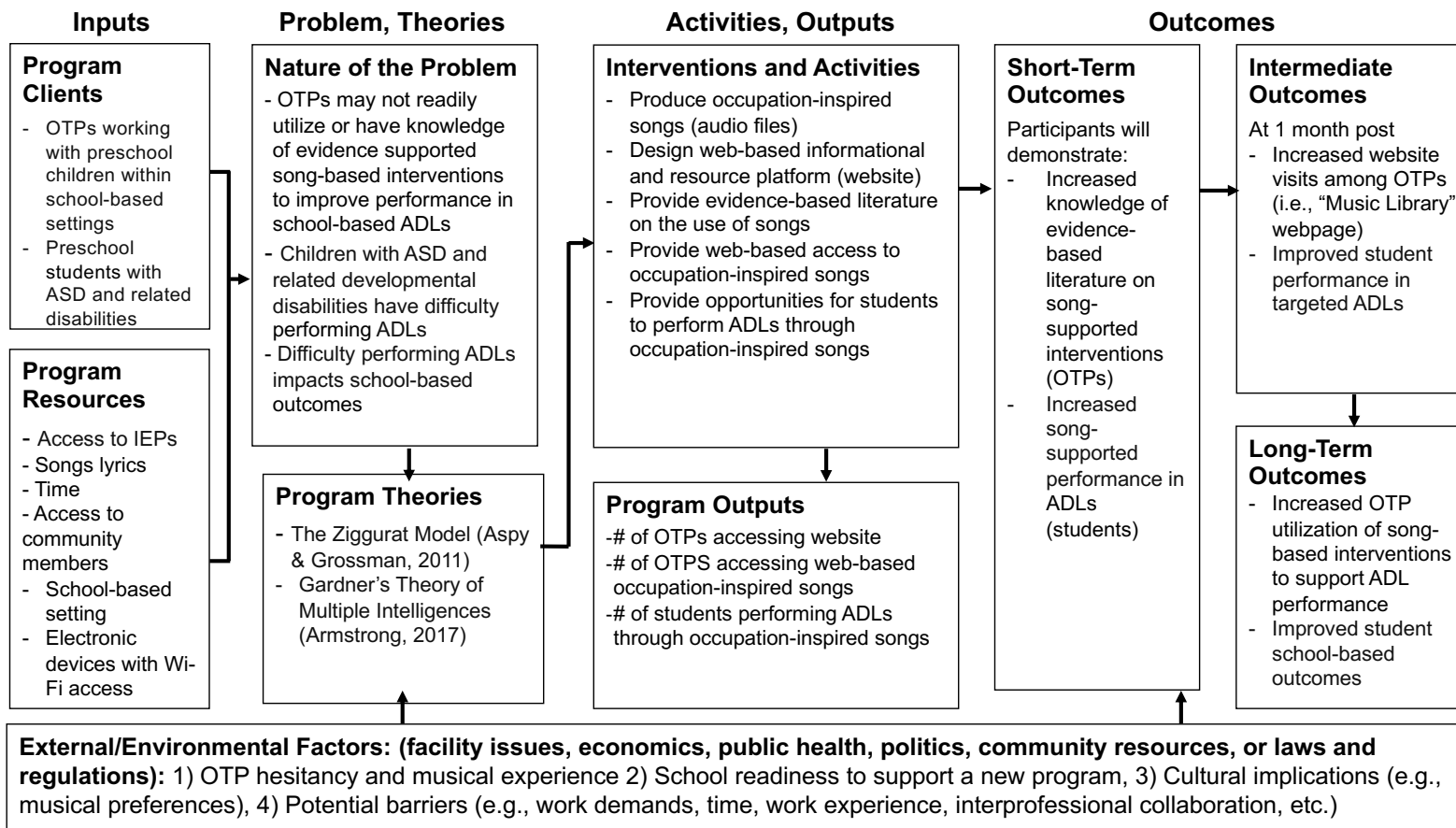
Program's Explanatory Model

The explanatory model for the SING-OT program is presented in Figure 4.1. It provides a visual overview of the intended program inputs, activities, and outcomes. Selected theoretical frameworks that inform the nature and design of the program were described in chapter two and are listed under *Program Theories*. The Ziggurat Model (ZM) and the theory of Multiple Intelligences (MI) were selected because of their recognition and value of individual strengths, interests, needs, and consideration of the client's contributions (e.g., active participants) throughout the assessment and intervention process (Armstrong, 2017; Aspy & Grossman, 2011). The author intends to incorporate key principles from the ZM and theory of MI throughout the development of the program.

Figure 4.1

Full Logic Model for Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT)

SING OT: Song-based Interventions for Navigating Gains in Occupational Therapy



Overview of Key Stakeholders

Primary program participants for SING-OT are preschool children between the ages of three to five years and OTPs who will utilize the songs while supporting engagement and performance in school-based occupations. Supporting *community members* include but are not limited to parents/ caregivers, classroom teachers, special education administrators, and expert consultants.

Description of Program Elements

The author proposes to launch the SING-OT program in three phases. Phase 1 will include the online platform that will help to inform, promote awareness, and provide access to occupation-inspired songs. Phase 2 will consist of a formal research study, where one song selected from the SING-OT program will be piloted to measure intervention effectiveness for a small group of participants. Future considerations will extend to developing caregiver trainings in Phase 3. This doctoral project will address activities within Phases 1 & 2.

During Phases 1 & 2, the program will require access to technology, web access with reliable Wi-Fi, lyrics to originally composed, occupation-inspired songs by this author, time, and access to primary participants and supporting community members. The author will begin to work on the production and conversion of occupation-inspired songs into audio formats. To support occupational performance, each song will contain evidence-supported musical elements such as simple or familiar melodies, rhythm, repetition, and expectation (Gardiner & Thaut, 2016; Knott & Thaut, 2018; Schwartzberg & Silverman, 2014; Sena Moore & Hanson-Abromeit, 2015; Thaut et al., 2014; Tillmann

et al., 2014; Vaiouli & Ogle, 2015). The author will collaborate with a licensed music therapist or music therapy researcher who will help to analyze and identify key evidence-supported musical elements in each song. The program (introduction and songs) will be hosted on a web-based platform. The proposed effectiveness study will occur within a school-based setting.

Program Participants and Resources

Primary program clients will be OTPs and the student with whom each works. Practicing OTPs will carry out the intervention during Phase 2. The author will serve as the primary investigator and will oversee and support implementation of program phases. Additional participants, synonymously listed as *community members* in Figure 4.1 include caregivers and parents, classroom teachers, school administrators, and other professionals who may be interested in exploring how OTPs might support this population through a music-based and strengths driven approach.

Interventions and Activities

During Phase 1 of program implementation, the author will work with a music professional to produce at least one song and convert it to an easily accessible audio file. The author will purchase a domain name and design a website to host supportive materials such as background information, helpful resources, and audio files (songs). Details for the SING-OT website are outlined below.

The website will include the following pages:

1. **About SING-OT:** An overview of the program. This section will contain a description of the guiding theoretical frameworks that support the program and

evidence-based literature on song-based interventions.

2. **Provider Resources:** Educational and intervention planning resources for OTPs. It will also include helpful resources for teachers and caregivers who may be interested in learning about how SING-OT might benefit their child.
3. **Student Resources:** This section is for users who would like to explore resources to promote self-advocacy among students through a strengths-driven and collaborative approach. Resources will be geared towards honoring student voice and choice during the intervention process.
4. **Music Library:** This section will include an ongoing collection of occupation-inspired songs, lyrics, and evidently videos demonstrating how song-based interventions are helping young children succeed.
5. **Contact Us:** This section will enable users to stay in touch. Email addresses will be collected with user permission. Users will have an opportunity to subscribe to the website for email updates of new features, forms, and songs. Accessible formats and tools will be considered to support users with neurodiverse learning preferences.

In this phase, OTPs and similar professionals will have the opportunity to access and utilize the songs and resources to support their student clients with participating in school-based ADLs. Formal measures of effectiveness will not be required during this phase. Phase 1 will be considered the trial period by which the author will seek to obtain user feedback and experience with using the online resources. The author will continue to develop and upload new songs and material to the website as they become available.

During Phase 2, the author will identify students who may benefit from a music-supported approach to perform ADLs. Prior to recruitment, IRB approval will be obtained along with the completion of necessary ethics training by all participating personnel (e.g., OTPs, research assistants, etc.). Informed consent and assent forms for participation of minor-aged participants will also be attained. The initial study will aim to determine the effectiveness of a song designed to improve performance in a targeted grooming and personal hygiene task (i.e., handwashing) within a preschool setting with young children with ASD. The author intends to publish research findings to add to the body of knowledge in occupational therapy research that supports OTPs use of song-based interventions to promote engagement in meaningful occupations. Lyrics to the handwashing song can be found in Appendix B.

Additional Details

The overall goal of the SING-OT program is to provide OTPs with an additional intervention tool or teaching strategy when working with young children who have difficulty participating in and performing ADLs. It is understood that users may have different learning preferences. Therefore, efforts will be made to provide resources in various formats (e.g., accessibility features, health literacy) to support individual differences. In addition, the author intends to create a community of OTPs and other professionals who are using SING-OTs web-based resources. This will provide valuable formative and summative information during program evaluation.

Program Outputs and Outcomes

The following sections will provide an overview of the intended program outputs for SING-OT. The outcomes will primarily benefit two groups of participants: (1) OTPs who are seeking knowledge on evidence-based music-supported (songs) interventions and who will implement the intervention during Phase 2 and (2) Preschool children with disabilities who have difficulty performing school-based occupations related to ADLs.

Overview of Anticipated Program Outputs

The SING-OT program anticipates the following outcomes:

- Number of OTPs accessing the website
- Number of OTPs accessing web-based occupation-inspired songs or song webpage
- Number of students performing ADLs using occupation-inspired songs

By providing access to valuable web-based resources and educational materials on the use of song-based interventions to support occupational performance, OTPs may be willing to explore and utilize the resources while working with their clients.

Time Frame of Anticipated Outcomes

The following sections will provide an overview of time frames for the anticipated outcomes of the SING-OT program.

Short-term

- During weeks one to four of website launch (Phase 1), OTPs will self-report increased knowledge of evidence-based literature on song-based interventions, as evidenced by identifying two benefits of song-based interventions for children

with ASD and related disabilities.

- During Phase 1 of program implementation, OTPs will report increased student performance in ADLs when using song-based interventions

Intermediate

- At one month post program (Phase 1), the website will generate at least 50% increase of website visits by OTPs
- At one month post program (Phase 2), student participants will demonstrate improved performance in a targeted ADL as evidenced by completing 75% of steps included in the task using song-based interventions.

Long-term

- At three months post website launch, OTPs will report increased utilization of song-based interventions by 50% (*Somewhat Often*). See question five in the *Sample OTP Interest Survey Questions* in Appendix C.
- At three months post intervention in Phase 2, 100% of student participants will demonstrate retained gains in ADL performance as evidenced by maintaining or exceeding post-intervention performance (i.e., not returning to baseline performance).

Description of Anticipated Outcomes

The desired outcomes for the SING-OT program are (1) increased self-reported knowledge by OTPs on evidence-based literature supporting song-based interventions, (2) increased utilization of songs among OTPs, and (3) improved student school-based outcomes (performance) in ADLs.

Overview of Outreach Plan

Opportunities to gain interest among community members and primary participants will occur at the author's primary place of employment or in other local school-based settings in New York. One example includes providing a brief in-service presentation of the program with an emphasis on the impact of song-supported interventions for preschool children with disabilities. Another way to engage community members will be to generate a short anonymous caregiver survey to determine general interest in students' participation or exploration of music-supported learning experiences (interventions).

After the program has been introduced during Phase 1, ongoing strategies will be executed to promote awareness and gain interest. Examples include social media posts, web-based introductory videos, and other avenues. Prior to website launch, an online survey will be generated to gain interest among practicing OTPs into the proposed program. Results from this survey may be published on the website to generate further interest. The author will also consider community updates through a free web-based subscription or social media group to alert users of new website content. Responsiveness and interest during this initial outreach period will help determine the timeframe to begin Phase 2 (effectiveness study).

Sample Proposed Timeline

Four Weeks Prior to Website Launch

- Conduct a brief interest survey among school-based OTPs who want to explore new resources to support their interventions. See sample OTP Interest Survey

questions in Appendix C.

Two Weeks Prior to Website Launch:

- Outreach and marketing activities through social media, author's private company website, professional networks, word of mouth, and launch video announcements

Website Launch (Weeks 1–4):

- Monitor bi-weekly user statistics through website and page visits and assess if additional outreach measures need to be taken
- Review and update content as needed
- Create user feedback link (random and anonymous)
- Analyze data on user feedback using basic website analytics

Website Launch (Weeks 5–8):

- Continue to monitor user statistics (e.g., web traffic)
- Review and update content as needed
- Make changes per data received from user feedback

Weeks 9–12:

- Preparation for Phase 2 activities

Anticipated Barriers and Challenges

As with any innovative program or novel intervention, there may be barriers or challenges that might potentially impact program outcomes. Primary barriers in Phase 1 might include lower than anticipated website traffic due to marketing strategies or lack of interest in the proposed program. Additional barriers might include OTP hesitancy and lack of experience with song-based or music-based interventions. During Phase 2, factors

such as location or school program readiness to host a formal research study, randomization of participants, sample size, student and OTP cultural implications related to musical preferences, and work-related demands (e.g., time, interprofessional collaboration, etc.) may pose as barriers.

The author may attempt to mitigate the challenges during Phase 1 by extending promotion time and activities prior to the website launch and starting small. Examples include utilizing a familiar location such as the author's primary place of employment with low-tech marketing strategies such as word-of-mouth, physical brochures, and mini-live presentations. During Phase 2, the author might consider alternate school-based programs or settings such as forming community relationships with childcare settings for participant recruitment. A plan to recruit larger groups of participants may also help to generalize research findings to the intended population of young children with ASD and other developmental disabilities. Additional time can also be devoted during a pre-recruitment phase to gain insight into cultural implications of the populations served and to understand how these differences might impact the intended outcomes based on song-selection or musical preferences.

Summary and Conclusion

The SING-OT program proposes to address and improve occupational performance difficulties among preschool children with ASD and related disabilities. Research supports providing children with opportunities to learn and participate in meaningful occupations through varied experiences (Armstrong, 2017). The SING-OT program is grounded in an interests and strengths-based framework that recognizes the

impact of individual differences during intervention planning (Armstrong, 2017; Aspy & Grossman, 2011). Program development will occur in three phases: (1) website launch, (2) effectiveness study, and (3) caregiver training. The current proposal addresses activities within Phases 1 and 2.

SING-OTs online educational and resource platform will provide OTPs with an overview of the theoretical framework, evidence-based literature on song-based interventions, and helpful resources that they can use during intervention planning. Resources on the website will also be beneficial for other school-related professionals and caregivers who want to explore songs to support performance in meaningful occupations. Through this resource sharing platform, the author hopes to encourage interprofessional collaboration among individuals who regularly work with or support children with neurodiverse needs.

An initial effectiveness study will be conducted using an originally composed song to address a grooming and personal hygiene task among a small group of preschool children with ASD and similar disabilities. While music-supported interventions are not novel to occupational therapy practice (Bonnell, 2020; Cohn et al., 2017; Dinan et al., 2018); limited research exists in the occupational therapy literature on the explicit use of *songs* to support performance in meaningful occupations. Evidently, the author hopes that through this program, more OTPs would be encouraged to SING; utilizing *Song-based Interventions to Navigate Gains in Occupational Therapy*.

CHAPTER FIVE – Program Evaluation Research Plan

Introduction

Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT) is an educational intervention program designed to improve the participation and performance of preschool children with disabilities in activities of daily living (ADL), through evidence-supported, occupation-inspired songs. Delivered through an online platform, the initial phase of the SING-OT program will provide occupational therapy practitioners (OTPs), related school-based professionals, and caregivers with access to occupation-inspired songs and helpful resources to support young children with autism spectrum disorder (ASD) and other developmental disabilities perform meaningful school-based occupations. The SING-OT program will occur in three phases: (1) website development, (2) effectiveness study at a preschool or other school-based setting, and (3) caregiver training. This program evaluation research plan will address phases one and two, with an emphasis on the proposed effectiveness study in phase two.

Intended Users of the Program Evaluation Research

Primary program participants will be preschool students and the OTPs who will deliver the intervention. Additional participants, synonymously listed as supporting *community members* will include parents/caregivers, classroom teachers, special education administrators, and expert music-related consultants. Results of the proposed program evaluation research findings will likely be beneficial to practicing pediatric OTPs, parents/ caregivers, educational personnel (i.e., teachers and administration), music-related researchers, and other organizations who are committed to supporting the

needs of young children with disabilities.

Practice Scenario

Table 5.1

Practice scenario describing song-based interventions for a child with attention deficit hyperactivity disorder (ADHD).

Jade's Song

Jade is a 5-year-old girl who attends Sunshine Preschool. Jade has a diagnosis of ADHD. She has difficulty performing most activities of daily living (ADLs) within her classroom. When she attempts to complete expected tasks, such as unpacking her backpack during morning routines, she needs frequent reminders from her teachers to complete each step. Jade's teachers are concerned that her lack of independence with completing morning routines might impact her school performance when she graduates. They have noticed that Jade enjoys music and is often heard singing songs to herself throughout the day. Her teachers consult with an occupational therapist (OT) who spends time observing Jade and listening to her songs. The OT later suggests using Jade's songs to help her get through the morning routines. Recognizing the types of songs that Jade likes to sing (i.e., nursery rhymes), the OT considers similar elements and musical mnemonics to create a song that helps Jade move through the morning unpacking routine. After introducing the song and using it during the classroom unpacking routine, she was more successful with completing each step with less support from her teachers.

Occupational therapy song-based interventions can help students like Jade improve their independence during school-based ADLs.

Vision

The vision for the SING-OT program evaluation research is to demonstrate the impact and effectiveness of song-based interventions delivered by occupational therapy practitioners, to support young children with disabilities engage in necessary school-based occupations. Children with ASD experience difficulties with participating in and performing ADLs (Gronski & Doherty, 2019; Lee, 2018). Occupational therapy practitioners are skilled in designing client-centered interventions that promote positive outcomes in occupational performance.

In the short-term, results from the program evaluation research plan may demonstrate the impact of song-based interventions for improving student ADL performance during school-based occupations. In the long term, research from the SING-OT program may accomplish the following: (1) encourage more OTPs to utilize song-based interventions and (2) contribute to the occupational therapy knowledge base that encourages the creative and innovative use of occupation-centered interventions to improve outcomes among young children with disabilities (Laverdure & Beisbier, 2021). In addition, future considerations will provide opportunities to promote positive caregiver outcomes (i.e., reduced stress and caregiver burden) through caregiver training programs (Long et al., 2015; Sood et al., 2018).

Engagement of Stakeholders

Stakeholders for the SING-OT program are outlined in Table 5.2. They include the primary researcher or author, program participants, supporting community members, and additional music-related professionals. The SING-OT program will value and recognize contributions from each stakeholder.

Table 5.2

SING-OTs Stakeholder and Stakeholder Group Members

| Stakeholder or Stakeholder Group |
|---|
| <p>Primary</p> <ul style="list-style-type: none"> • Primary researcher • Program participants <ol style="list-style-type: none"> 1. <i>Preschool students</i> with ASD and other developmental disabilities 2. <i>OTPs</i> practicing in a preschool setting or another setting with preschool-aged children |
| <p>Supporting Community Members</p> <ul style="list-style-type: none"> • Parents/ Caregivers • Teachers- Special education preschool and assistant teachers • Other school administrators- Education Director, Principal/Assistant Principal, Coordinator of Related Services |
| <p>Additional</p> <ul style="list-style-type: none"> • Music-related professionals- Music therapy researcher |

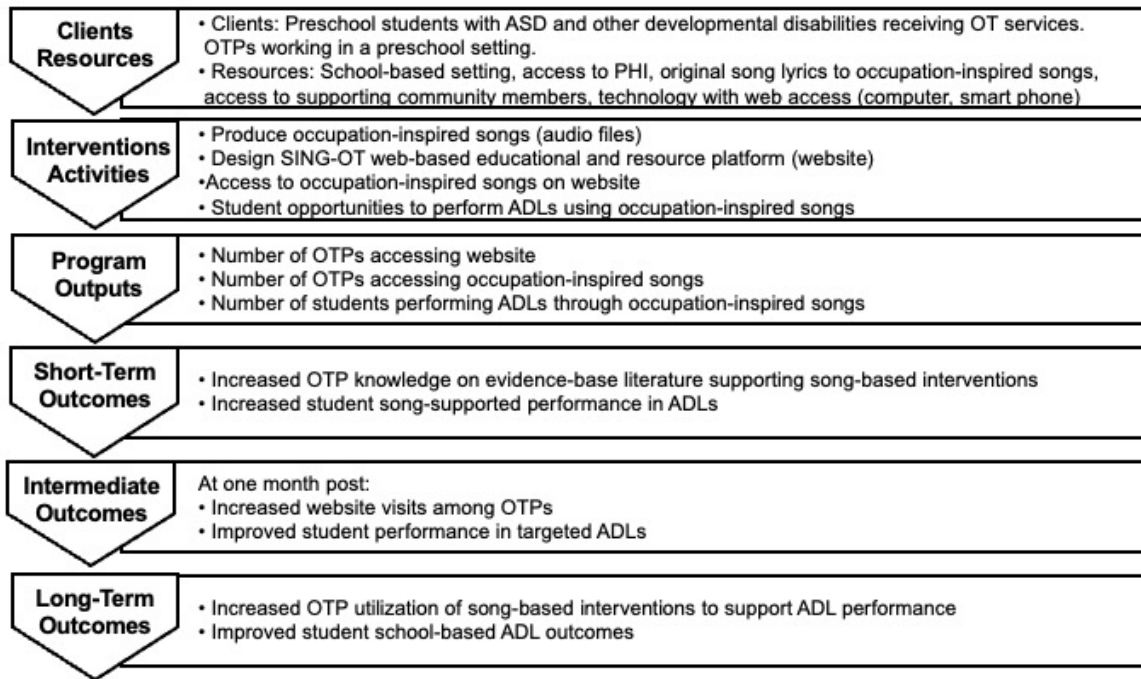
Strategies of Engagement

SING-OT's initial program evaluation plan was discussed with a music therapy researcher who expressed interest in the program and proposed outcomes. The primary author will engage OTPs by providing access to free web-based resources on evidenced-supported use of songs to promote engagement in meaningful occupations. OTPs and supporting community members (i.e., teachers, parents/caregivers) will also have access to the music resource library on the SING-OT website. They will have the opportunity to utilize originally composed, occupation-inspired songs with their clients, students, and children. Since parents and caregivers will provide valuable insight into their child's preferences, strengths, interests, and level of readiness for participation in the program during Phase 2 (effectiveness study), their interest in the program will be of prime importance. Engagement among all stakeholders will be facilitated through active listening, ongoing communication, honoring student voice, and through the recognition of values, needs, interests, and the proposed benefits of participating in the program.

Simplified Logic Model

Figure 5.1

Simplified logic model for Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT)



The simplified logic model in Figure 5.1 demonstrates how the use of song-based interventions may contribute to improved outcomes in school-based ADLs among preschool children with disabilities. The logic model illustrates the path by which program interventions lead to the intended outcomes of (1) increasing use of song-based interventions among OTPs and ultimately, (2) improving student performance in school-based ADLs. Operational definitions of key terms are presented below for clarification and to offer guidance with measuring variables.

Operational Definitions:

Activities of Daily Living (ADL): Daily activities related to taking care of one's own body (AOTA, 2020).

Occupations: Everyday activities that are personally meaningful to the client (AOTA, 2020).

Occupation-inspired Songs: Originally composed songs by an occupational therapist or in collaboration with a music therapist using occupation-based, modified activity analyses and key musical elements (melody, repetition, etc.) to support young children with engaging, participating, and performing common ADLs.

Performance: Completing part or whole steps of an activity with varying levels of support. May be marked by a positive or negative change in a skill or level of participation. Performance may vary based on individual differences.

School-based ADL Outcomes: An identified area of occupation that interferes with or impedes a student's successful performance within a school-based setting.

Targeted ADL: A selected occupation or personalized daily activity to be supported through song-based interventions.

Preliminary Exploration and Confirmatory Process

The author will ensure buy-in and obtain support from stakeholders through a tiered approach. During Phase 1, small group meetings and other engagement activities will be considered when introducing and promoting the program among educational personnel, music research experts, and OTPs. Group meetings will introduce the web-based educational and resource platform and address key components. Key components

include the importance of addressing ADLs for the intended student population and providing an overview of evidence-based literature on song-based interventions.

During Phase 2, a simplified approach will be utilized with parents and caregivers to introduce the program, discuss potential benefits, and to gain interest for their child's participation. One example is developing short caregiver interest surveys to obtain information on their child's strengths and interests. In addition, the author will seek to gain stakeholder perspectives regarding the feasibility of implementing an innovative approach for supporting young children with disabilities within a school-based setting.

Lastly, the author will provide an explanation of the proposed program evaluation research design, including methods for data collection (e.g., observations, student-self-rated likeability scale, brief surveys, etc.). Stakeholders will be encouraged to share and make recommendations regarding proposed program strategies and data collection methodology. In keeping with the program's theoretical framework, the author will consistently consider individual stakeholder preferences, goals, and needs during all phases of program development. Examples include designing web-based resources with respect to health literacy needs and conducting meetings through various methods based on stakeholder preference (e.g., in-person, audio-visual, and live virtual sessions).

Table 5.3

Stakeholder List with Proposed Program Evaluation Questions and Methods

| Stakeholder or Stakeholder Group | Program Evaluation Questions |
|--|---|
| <p>Primary Stakeholder Title: Primary Researcher (Author/ Developer of Program)</p> | <p>To what extent are song-based interventions effective in supporting the student’s overall performance in school-based ADLs? (Summative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Pre/post-tests • Assessments <p>How well do song-based interventions support the student’s preferences, interests, and strengths when performing ADLs? (Formative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Review of interview questions • Strengths and interest questionnaire developed by the Ziggurat Model |
| <p>Program Participants:</p> <ul style="list-style-type: none"> • Preschool children • Pediatric OTPs | <p>Preschool Children</p> <p>In what ways did songs help me to <u>(insert ADL activity)</u> better? (Summative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Likert scale with icons <p>How much did I like the songs that help me to <u>(insert ADL activity)</u> better? (Formative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Interview with picture icons to support understanding of questions • Likert scale with icons <hr/> <p>OTPs</p> <p>To what extent are song-based interventions easily accessible and easy to implement when supporting school-based ADLs? (Summative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Surveys • Number of website visits (website and songs webpage) |

| | |
|--|---|
| | <p>How well do song-based interventions improve student performance in ADLs? (Formative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Open ended written questions • Interview • Observations (i.e., descriptive observational scale) |
| <p>Community Members</p> <ul style="list-style-type: none"> • Parents/ Caregivers • Teachers • Special Education Administrators (VP of Education, Principal, Preschool Related Services Coordinator) | <p>Parents/ Caregivers</p> <p>In what ways would song-based interventions help my child participate and perform school-based ADLs? (Summative)</p> <p>Method</p> <ul style="list-style-type: none"> • Multi-select questionnaire <p>How would I know if my child enjoyed or benefited from this intervention? (Formative)</p> <p>Method:</p> <ul style="list-style-type: none"> • Interview • Caregiver interest survey • Review of video recordings (observations) <hr/> <p>Teachers</p> <p>To what extent would participating in song-based interventions help my students succeed in the classroom? (Summative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Likert scale <p>How would I be able to support my students with carrying over what they've learned through song-based OT interventions? (Formative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Case studies <hr/> <p>Special Education Administrators</p> <p>To what extent would participating in song-based interventions impact learning? (Summative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Likert scale • Surveys |

| | |
|--|---|
| | <p>How would song-based interventions change the way students learn important life skills (improve or hinder)? (Formative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Interview |
| <p>Additional Stakeholders</p> <ul style="list-style-type: none"> • Expert consultants (Music-related therapists or researchers) | <p>Additional Stakeholders:</p> <p>To what extent would a song-based intervention delivered by OTPs encourage interprofessional collaboration with music-related professionals? (Summative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Descriptive-number of increased collaborative sessions <p>How can OTPs collaborate with music-related professionals to develop occupation-inspired songs with evidence-supported musical elements? (Formative)</p> <p>Method(s):</p> <ul style="list-style-type: none"> • Interview • Review and analysis of songs by a licensed music therapist |

Table 5.3 provides a list of key program stakeholders with proposed program evaluation questions. Stakeholders are grouped in four categories: (1) the primary researcher who is the author, (2) program participants who are the primary stakeholders, (3) community members or supporting participants, and (4) additional stakeholders which include music therapy or music related experts and consultants. Research questions are written with the purpose of obtaining summative and formative data to support the outcomes of the program.

Research Design

During Phase 1, the author will not employ a formal research design, as the primary focus of the SING-OT program involves measuring the effectiveness of song-based interventions to support performance in ADLs (Phase 2). During this non-experimental, website development and launch phase of the program, formative and summative strategies will help obtain information regarding stakeholder interest and experiences with utilizing the web-based resources. Examples will include brief interviews, short answer surveys, social media outreach posts and videos, and other qualitative strategies. Surveys will be designed using Google forms (Google, n.d.) or other survey generating platforms and will primarily be distributed electronically, based on user preference. Please see the *Methods* section below for additional information. Furthermore, summative processes will include monitoring website statistics (i.e., web visits) and making content changes based on stakeholder feedback.

During Phase 2, the SING-OT program will utilize an experimental, mixed-methods, multiple-baseline across participant single-subject design. Single-subject designs enable individual performance or behaviors to be measured repeatedly, while each subject serves as their own control (Krasny-Pacini & Evans, 2018). This study design will support the program's overall goal of measuring the effectiveness of song-based interventions to support ADL performance among preschool children with disabilities. SING-OTs preliminary study will address a common personal hygiene and grooming task that addresses the following research question: *Given preschool children with ASD and other developmental disabilities, will a song-based intervention designed*

to address handwashing skills be effective in improving handwashing completion within a school-based setting?

The author's hypothesis is after receiving the intervention, *Song-based interventions will be more effective in improving student performance in a routine school-based ADL (i.e., handwashing) than traditional classroom or educational approaches (verbal cues, visual prompts) alone.* If the anticipated outcomes are observed, future studies will examine other populations and age groups utilizing song-based interventions to address additional childhood occupations (e.g., play, education, social participation, etc.). The author will also consider song-based interventions to compare the occupational performance outcomes in groups of children with and without disabilities. Lastly, the author will collaborate with other professionals such as OTPs, speech and language pathologists, teachers, and music therapists to develop songs in different languages (e.g., Spanish, Haitian-Creole) to support populations across various cultures.

Methods

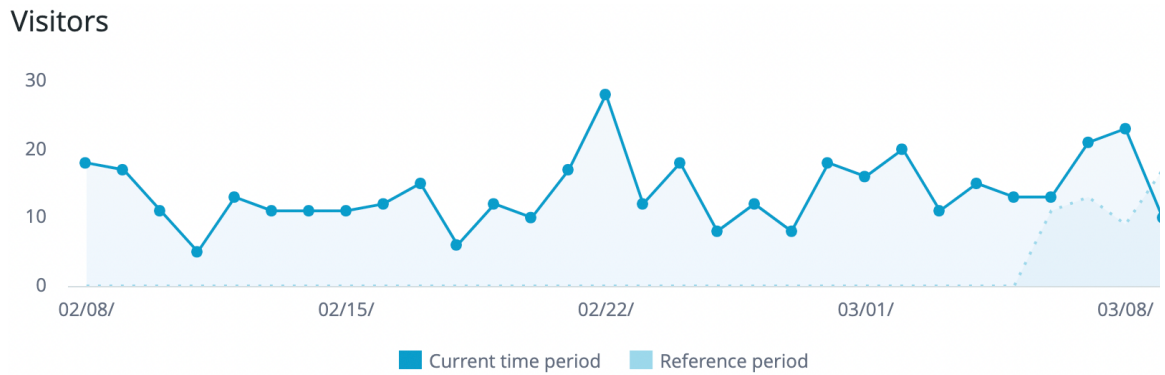
Phase 1 of Program Implementation (Website Development & Launch)

During Phase 1 of program implementation, a mixed methods approach will include qualitative and quantitative strategies to achieve the goal of gathering general information on stakeholder interest, user experience, and utilization of web-based resources. During this website development phase, the author will utilize a web hosting platform such as IONOS Website builder that provides basic website analytics (IONOS, n.d.). Primary data collection will include tracking the number of visitors and analysis of most frequently visited pages. Sample data charts are provided in Figure 5.2 and Figure

5.3. The data have been generated from the primary author’s private company’s website and is intended for informational purposes only.

Figure 5.2

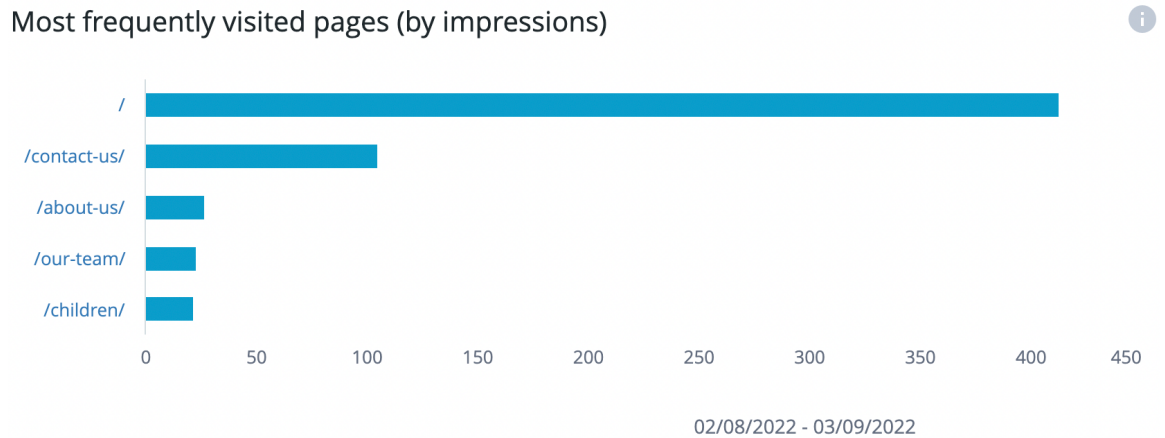
Sample website analytics of number of website visitors per week (30-day period).



Show details

Figure 5.3

Sample website analytics of most frequently visited pages (30-day period).



Data collection will occur throughout the pre-launch and full launch phases of the web platform. A proposed timeline can be found in chapter four. The initial OTP interest

survey will be generated using Google forms (Google, n.d.). Google forms collects pre-determined data on completed forms (e.g., email, responses, etc.) and generates general analytics that will serve the overall purpose during this phase of program development. A sample interest survey can be found in Appendix C. Future considerations will involve developing a social media networking or community engagement group where OTPs who are utilizing song-based interventions through the SING-OT program may share their experiences with other community members.

Phase 2 Implementation of Formal Research Study

During Phase 2 of program implementation, the author will seek institutional review board (IRB) approval prior to enrolling participants and collecting data. Ethics trainings such as through the Collaborative Institutional Training Initiative (CITI) will be completed along with any additional trainings recommended by the author's facility or organization (CITI, n.d.). An IRB application and protocol will be completed and submitted. The primary researcher will assure that ethics trainings are also completed by primary members of the research team such as research assistants, OTPs delivering the intervention, data analysis team, and support consultants.

Informed consent and assent forms will be provided to parents and caregivers of student participants. Assent forms are required since the primary participants are children under the age of 18. They assure that parents and caregivers are aware of the potential risks and benefits of participating in the intervention (Giancola & Morrison, 2021). Confidentiality would be assured through including assigning pseudonyms to student participants, maintaining data in a password protected or secure platforms, obtaining

media release consent forms for video recorded sessions, and abiding by state and organizational regulations regarding protection of student's health information.

Participants

Ideal participants for the effectiveness study will be a small group of three preschool children, between the ages of three to five with a clinical diagnosis of ASD or other developmental disability. To increase rigor, the author will utilize sampling so that participants are representative of the preschool population of students with ASD and other developmental disabilities. Initial participant recruitment will begin at the parent/caregiver level, through an interest survey soliciting their child's participation in the program. Participants selected for the study will be children who (1) are receiving occupational therapy services at least once per week and (2) who have an identified delay in daily living skills in accordance with their individualized education plans (IEP). In addition, caregiver and/or teacher reported concerns should be related to the targeted ADL being addressed in the proposed intervention.

Exclusion criteria will include: (1) children who may have an identified delay in daily living skills, but whose current level of performance does not significantly impact participation in school-based occupations and (2) when there is documented evidence of mastery in the targeted ADL being addressed in the proposed study. Mastery will be measured through a customized, descriptive observational rating scale. A sample is provided in Appendix D.

Setting

The study will take place within a special-education preschool or similar school-

based setting. It is recommended that a naturalistic setting be considered such as the specific location where the ADL task would typically occur. Examples might include the classroom, bathroom, or therapy room. The sink should be easily accessible to all students. Examples include a foot stool, low height sinks for students who use wheelchairs or other devices for functional ambulation (e.g., walkers) and with faucets that are within reach.

Person Delivering the Intervention

The SING-OT intervention will be administered by a trained, school-based clinician or classroom teacher who has experience working with young children with ASD and other developmental disabilities. Ideally, an occupational therapist, other than the primary researcher will pilot the initial study. The occupational therapist should have at least three years of experience working with the targeted population and have used music (particularly songs or singing) when supporting young children with engaging in meaningful occupations. Future developments may extend to other school professionals and clinicians delivering the intervention.

Intervention Fidelity & Data Collection

To assure intervention fidelity, the primary researcher will conduct formal trainings on intervention delivery (including how songs will be used), review of observational and descriptive rating scales, student self-rated scales, and other measures (i.e., standardized tests). Training activities will include teaching of the song(s) with rehearsal and practice opportunities to promote mastery of lyrics and musical elements (e.g., melody) and prompting strategies to control for behavioral challenges such as

distraction or non-compliance. A written protocol will be provided to increase internal validity. Additional ways to assure fidelity will include adherence to the study protocol, which includes utilizing pre-recorded songs while delivering the intervention, performing the intervention at the same time(s) of day, within consistent location(s), and by providing all participants with the same amount of contact time with the clinician delivering the intervention. All training resources will be available in web-accessible formats that can be referenced as often as needed. Considerations will also be provided regarding the placement of research participants. For example, the clinician delivering the intervention should stand or sit next to the student at the sink. Trained observers should stand or sit in a location that will not influence participant performance.

In collaboration with the classroom teacher, the primary researcher will select two times throughout the day where participants are expected to engage in the handwashing activity. Examples might include after using the bathroom, before a light snack, after returning from an outdoor activity (e.g., playground), or at the start or end of their occupational therapy session. To further reduce bias and threats to internal validity, it is advised that the observer is neutral to the participant (i.e., not a preferred staff member) so that their performance is not influenced by way of relationship.

Data Collection

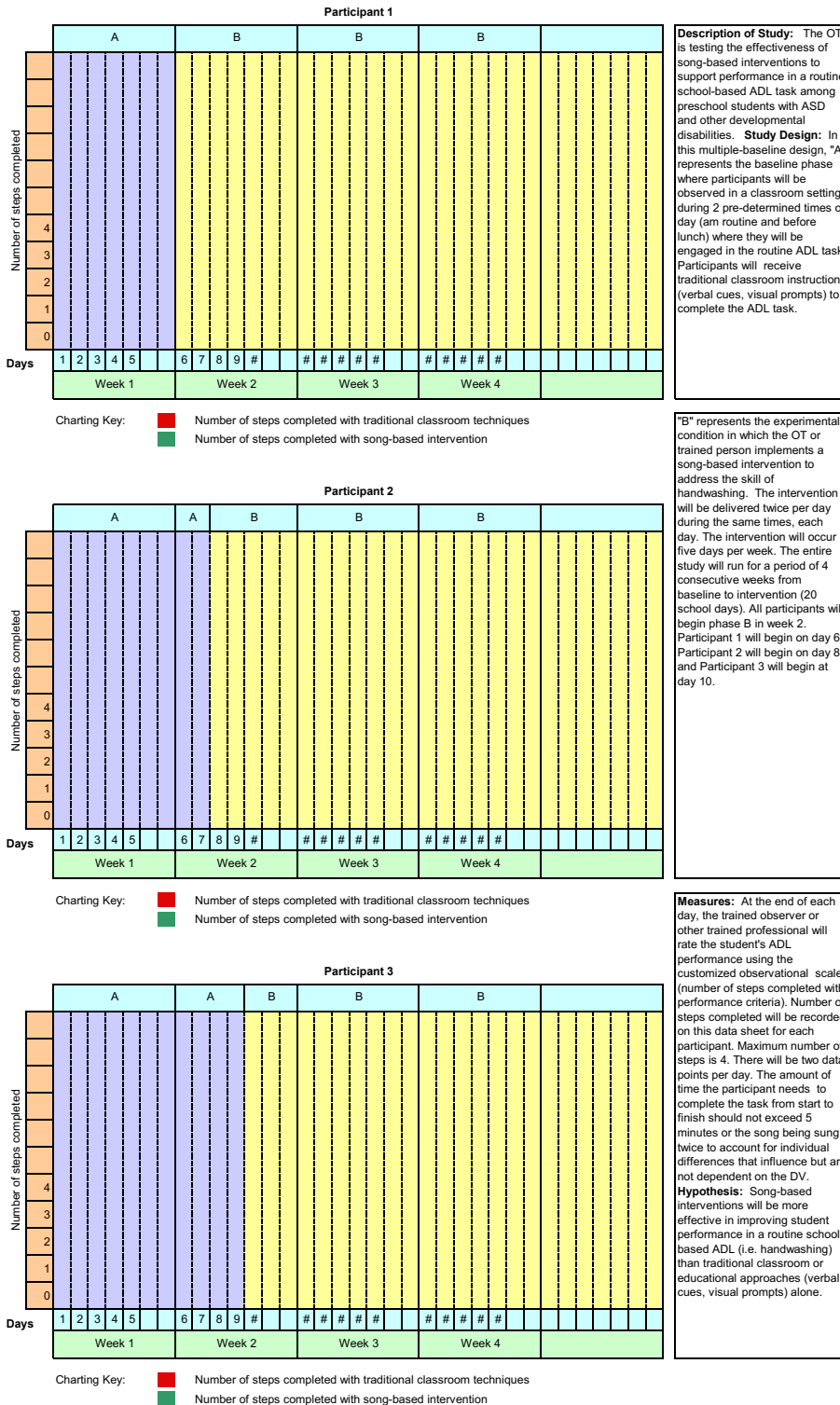
To reduce study bias, observational data will be collected by trained observers and not the clinician delivering the intervention. Trained observers can be occupational therapists, classroom teachers, teacher assistants, and other school personnel. Inter-rater reliability will be established through review of observational data forms and video

recorded sessions to determine level of agreement among raters. Ideally, the intervention will be videorecorded for data analysis. Review of video recordings and observational data forms will be performed by the primary researcher and trained observer(s).

The author recognizes that there may be instances where video recordings may not be possible such as when participants' parents or caregivers have declined use of recorded data. Therefore, careful tracking of observational data will be emphasized during trainings. A trained observer will record the number of steps completed using a descriptive observational rating scale (see Appendix D). A sample observational data form to be used during the proposed study is provided in Figure 5.4.

Figure 5.4

SING-OT Multiple Baseline Design Data Sheet



Timing

Figure 5.4 displays the data sheet for the proposed single-subject design study to address handwashing skills. During the baseline phase (Phase A), a trained observer will rate the participant while performing handwashing following traditional instructional methods such as through spoken, visual, or physical prompts provided by a classroom teacher or therapist. Two data points will be taken per day at pre-determined times for 5 days (10 data points). During the intervention phase (Phase B), participants will complete the same ADL task during the same times per day using a pre-recorded, sing-along song designed to provide steps to the handwashing task. Two data points will be taken per day for 10 days (20 data points).

Participants will begin the intervention on different days within week two. This sequential introduction during Phase B helps to demonstrate that change will occur when the intervention is provided and not by other factors (Krasny-Pacini & Evans, 2018). Participant 1 will start on day 6, Participant 2 will start on day 8, and Participant 3 will start on day 10. The study will run for a period of 4 weeks or 20 consecutive school days from baseline to the end of the intervention phase. It is understood that individual differences may impact the proposed length of the study. Therefore, through this study design, the primary researcher will have the flexibility to extend, shorten, or add a follow-up phase if deemed necessary.

Dependent Variable(s)

The dependent variable (DV) is “task completion” of the handwashing task. The DV is operationally defined as the number of steps the student completes, using four pre-

determined steps to the handwashing activity. The predetermined steps include *obtains soap, rubs hands together, rinses hands, and dries hands*. Set-up items (turns faucet on/off and obtains paper towel) are considered but are not measured during the intervention.

Independent Variable(s)

The independent variable (IV) is a pre-composed and recorded song that will address key components of a handwashing task. The clinician will utilize the *Handwashing Song* when the first step is initiated by the participant. To further assure intervention fidelity and account for individual differences related to processing time, the song will be played and sung for a maximum of two times during each session (not to exceed 5 minutes).

Measurement of Dependent Variables

During the baseline and intervention phases, the DV will be recorded by a trained observer using a customized, descriptive observational scale that measures the number of steps completed with specific performance criteria (see Appendix D). Descriptive ratings include *does not perform, performs with help, and performs without help*. Observational scale data will be transferred to an excel spreadsheet that will assist with providing numerical and graphical analysis. See Figure 5.4.

Additional Measures

In addition to the descriptive rating scale, it is understood that there may be variations in participant records regarding initial assessments used to determine delay or functional limitations. Therefore, a standardized measure may be employed for pre and

post assessment of student performance. One example is the Pediatric Evaluation of Disability Inventory (PEDI). The PEDI is designed to identify limitations in functional performance and is a preferred tool because of its application to the proposed study and overall clinical utility. It serves as an outcome measure that is ideal for monitoring progress within therapeutic and educational settings (Mruzek & Szymanski, 2013; Williams et al., 2017; Wilson et al., 2015). An occupational therapist will administer the assessment to fulfill the administration requirements (Pearson Qualification Level B) (Pearson, n.d.). Qualified users are persons who will assume responsibility for all aspects of the selected measure including administration, scoring, interpretation, and application. A *Level B* qualification entails that the provider or clinician have a master's degree in a related field, obtained specific training, membership in a professional organization such as the American Occupational Therapy Association (AOTA), or work for an accredited organization (Pearson, n.d.).

The PEDI has strong psychometric properties [internal consistency: Cronbach's $\alpha = 0.95-0.99$; interrater interclass correlation: $0.84-1.00$; test-retest reliability within one month of testing: $0.96-0.99$]. Construct validity has been established with other developmental screening functional independence measures such as the Battelle Developmental Inventory Screening Test (BDIST: $r = 0.62-0.92$) and Functional Independence Measure for Children (WeeFIM: $r = 0.80-0.97$) (Williams et al., 2017). In addition, the PEDI enables the evaluator to highlight a child's individual strengths and differences, which supports the theoretical concepts of the SING-OT program (Armstrong, 2017; Aspy & Grossman, 2011).

Data Analysis

This data analysis section will cover activities within Phase 2 of the SING-OT program. The author will utilize a Microsoft Excel tracking form to plot observational data. The tracking form will help to determine a change in participant performance from baseline to intervention through visual analysis. Anticipating that the song-based interventions support the study hypothesis noted in Figure 5.4, and promotes a positive trend, significant improvement can be confirmed using the C-Z statistic. A significant trend is indicated when the Z statistic is greater than 1.64 (Z cut off $p = .05$). Furthermore, since there will be more than 5 data points in each phase during the study, significant change between the DV and IV can be confirmed using celeration line analysis.

Plan for Data Management

In any program evaluation plan or formal research study, data management is just as vital as data collection. Good data management practices assure accuracy of findings, prepares raw data for analysis, and strengthens the internal validity of a study (Patino & Ferreira, 2018; Surkis, 2015). Recorded data will be stored on secure, password protected computers with web-based back-up procedures (i.e., cloud storage) to prevent data loss. The author will consider survey generating platforms such as Qualtrics (Qualtrics, n.d.). Data will also be categorized, coded, and organized (i.e., themes) using a qualitative and mixed methods software such as Dedoose (Dedoose, n.d.).

Anticipated Strengths and Limitations

Strengths

The SING-OT program is an innovative and occupation-based educational

intervention program that aims to promote and demonstrate the value of song-based interventions in supporting performance in meaningful occupations among preschool children with disabilities. The author hopes to promote student voice by providing participants with an opportunity to rate their experiences and to be involved throughout the intervention. Foundational principles are drawn from The Ziggurat Model and the theory of Multiple Intelligences (MI), which encourages engagement through exploration and recognizes the impact of individual differences, strengths, and interests throughout the assessment and intervention process (Armstrong, 2017; Aspy & Grossman, 2011). Therefore, all aspects of the program will consider participant and stakeholder preferences. While operating from a strengths-based lens, the author aims to encourage more OTPs to utilize song-based interventions when supporting young children with disabilities engage in meaningful school-based occupations.

Limitations

When conducting the intervention within a school-based setting several factors may influence study outcomes. For example, student performance may be impacted by the level of distractions present, individual differences (e.g., processing time, level of engagement, sensory processing), space or location (lighting, smells, number of people present), and classroom scheduling. Student absences and naturally occurring events such as illness may also occur. In addition, students who are not part of the study may want to join the intervention while it is occurring within a shared space.

Lastly, personal, and contextual factors may impact the study outcomes. Examples include the OTP's comfort level with singing, cultural implications regarding

singing in public spaces, participant musical preferences (e.g., dislikes song), and organizational barriers such as staff shortages. Despite these limitations, SING-OT is a promising intervention that will provide an evidenced-based approach to supporting engagement in meaningful occupations among preschool children with ASD and other developmental disabilities.

CHAPTER SIX – Dissemination Plan

Brief Description of Proposed Program

Children with autism spectrum disorder (ASD) and related disabilities may experience difficulties with performing and participating in important childhood occupations (Gronski & Doherty, 2019; Lee, 2018). Difficulties with occupational performance contributes to negative outcomes for both the child and caregiver (Gronski & Doherty, 2019; Lee, 2018; Lee et al., 2018; Long et al., 2015; Sood et al., 2018). Therefore, interventions that aim to improve outcomes related to occupational performance challenges are important. Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT) is an educational intervention program that aims to provide access to evidence-supported songs for occupational therapy practitioners (OTPs), caregivers, and other professionals to promote learning, participation, and performance in meaningful occupations among young children with disabilities.

With an initial focus on children with ASD and related disabilities, the SING-OT program proposes a three-phase launch that will address increasing knowledge on the evidence-based literature supporting song-based interventions, providing access to occupation-inspired songs, and creating opportunities to support caregivers of children with disabilities through training activities. A brief description of program phases is provided in Table 6.1. An in-depth description can be found in chapter four. This doctoral project will focus on phases one and two.

Table 6.1*SING-OT Program Launch Phases: Brief Description*

| | |
|----------------|--|
| Phase 1 | <ul style="list-style-type: none"> • Promote awareness into evidence-supported literature on song-based interventions through a web-based resource • Provide access to evidence supported and occupation-inspired songs to support performance in ADLs |
| Phase 2 | <ul style="list-style-type: none"> • Conduct an initial feasibility study that demonstrates the effectiveness of a pre-selected song on the completion of a common personal hygiene and grooming task • Potential for adding to the gap in occupational therapy literature exclusively utilizing song-based interventions to support occupational performance outcomes in ADLs |
| Phase 3 | <ul style="list-style-type: none"> • Create opportunities to improve caregiver outcomes through caregiver training activities |

Dissemination Goals

Through implementation of the SING-OT program, the author hopes to accomplish three long-term goals addressing phases 1 and 2 of the program. Short-term goals are also provided to measure the activities within each long-term goal.

Dissemination goals are outlined in Table 6.2.

Table 6.2*Dissemination Goals: Long and Short-term Goals*

| Long-term Goal(s): | Short-term Goals: |
|---|---|
| (1) As a result of accessing the SING-OT website, OTPs will demonstrate increased knowledge on evidence-based literature supporting song-based interventions | <ul style="list-style-type: none"> • Using a web-based survey tool, OTPs will self-report increased knowledge of evidenced-based literature on song-based interventions as evidenced by identifying two benefits of song-based interventions for children with ASD and related disabilities |
| (2) As a result of accessing occupation-inspired songs on the SING-OT website, OTPs will report increased utilization of song-based interventions by 50% (<i>Somewhat Often</i>) using the <i>OTP Interest Survey Questions</i> (see Appendix C). | <ul style="list-style-type: none"> • Using a web-based survey tool, OTPs will self-report utilization of at least one SING-OT song during their OT sessions when supporting performance in school-based ADLs. • Using a web-based survey tool, OTPs will report increased student performance in a targeted ADL when song-based interventions are used. |
| (3) As a result of participating in the intervention (feasibility study), preschool student participants will demonstrate improved performance outcomes in a targeted ADL activity using song-based interventions | <ul style="list-style-type: none"> • At one month post program, student participants will demonstrate improved performance as evidenced by completing 75% or more of steps to a targeted ADL when song-based interventions are used |

Target Audience

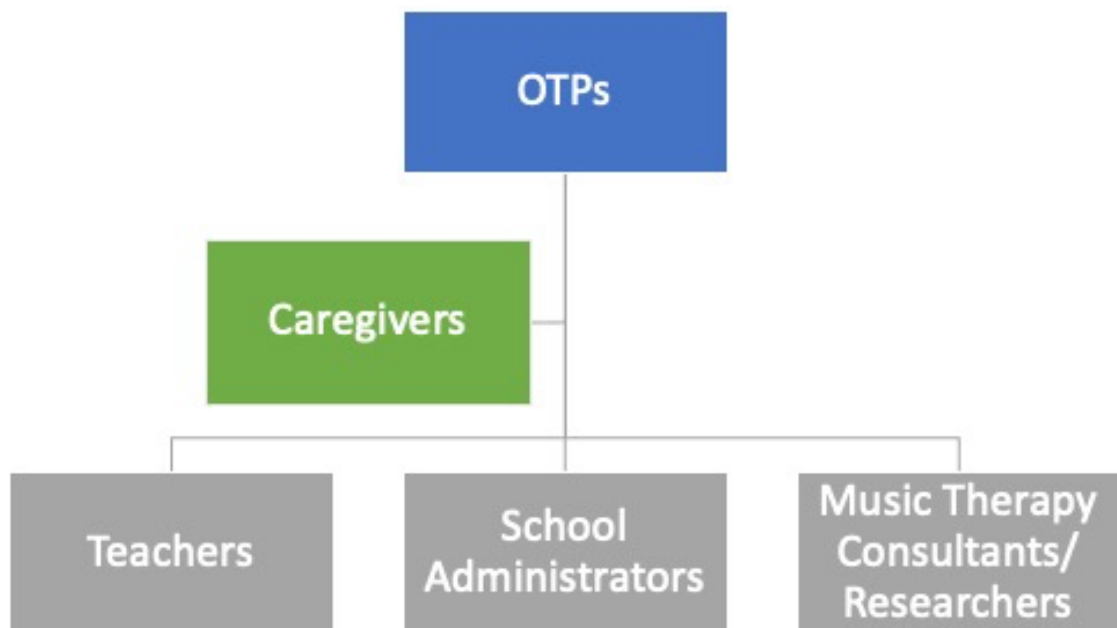
The primary audience members for the SING-OT program are school-based OTPs who are seeking additional resources to support young children during their occupational therapy (OT) sessions or those who are interested in exploring song-based interventions to improve student outcomes in important childhood occupations. Secondary audience members include parents and caregivers who will give consent to their child's participation in the program. Parents and caregivers are key members as they will not

only provide consent, but they are the student's primary representatives and support their voice. They would provide a level of insight into their child's needs, interests, and strengths. This may help to contribute to how well the child participates in the program.

Tertiary members will include classroom teachers, school administrators, and music therapy consultants and researchers. Classroom teachers will benefit from the proposed positive outcomes related to improved independence and participation among their students in important ADLs. School administrative personnel and music therapy consultants and researchers will support the program's goal for promoting interprofessional collaboration and facilitate the potential adoption of SING-OT by other programs and schools. Figure 6.1 outlines the target audience members for the SING-OT program.

Figure 6.1

Target Audience for the SING-OT Program



Key Messages

The SING-OT program recognizes that each audience member may have their unique values and beliefs about what matters most to them. Therefore, key messages are written in a way to communicate to the individual needs and interests of each of the stakeholders. In addition, select stakeholder categories are written with consideration of individual differences related to reading levels. These will be identified by an “RL” abbreviation and rated using Flesch-Kincaid grade level rating. Key messages are outlined below in Tables 6.3, 6.4, and 6.5.

Table 6.3

Key Messages: Primary Target Audience

| OTPs |
|---|
| <p>Dear fellow practitioners:</p> <p>Do you ever wonder how to motivate and best support your students when engaging in meaningful ADLs? Do you feel that you need additional resources to teach these important life skills? Well, SING-OT may be the answer. OTPs may use music and songs in their sessions but may not know if there is even evidence out there to support it. Look no further. The SING-OT program’s website contains resources for OTPs to connect what they do to what the literature supports. The songs you sing could be more meaningful than you think! Be sure to browse through the upcoming website, SING-OT.com to locate evidence supported song-based interventions and to access occupation-inspired songs written by OTPs to support young children with engaging and performing their ADLs. Check it out and let us know what you think in the</p> |

comments section. See you there!

Key Points:

- *Music-based interventions are beneficial in supporting participation and performance in meaningful occupations* (Paul et al., 2015; Sanglakh Goochan Atigh et al., 2017; Sharda et al., 2018; Simpson et al., 2013).
- *Song-based interventions contribute to positive outcomes than when spoken or other teaching strategies are used alone* (Paul et al., 2015; Sanglakh Goochan Atigh et al., 2017; Sharda et al., 2018; Simpson et al., 2013).
- *OTPs are skilled in developing innovative, client-centered, occupation-based, and evidenced-based interventions* (AOTA, 2020)

RL 7.2

Table 6.4

Key Messages: Secondary Target Audience

Parents and Caregivers

Hello parents:

Do you dread the morning routines? Does it take longer than you would like for your little ones to get ready in the morning? Have you tried singing but singing is not your thing? SING-OT offers resources for parents so that your child can do what they need and want to do in a fun way! Be sure to check out our upcoming website, SING-OT.com for songs that will help your little ones have fun while getting things done! If

you have any ideas for a song that you would like to hear, let us know and check out our *Songs* tab! Your next request may be your child's next song.

RL 4.9

Table 6.5

Key Messages: Tertiary Audience Members

| |
|--|
| Teachers |
| <p>Unpack, pack-up, wash hands, line up...</p> <p>Hey teachers! Does this sound familiar? With all the things that your students need to do throughout the day you may find yourself sometimes saying the same things over and over again. But, because you're amazing, you also recognize that your students learn differently and have different strengths. Is music a regular part of your day? How would you like to explore songs that help your students do what they need to do every day? The SING-OT program offers evidence-supported (yes, evidence!) songs that may help your students improve their participation in school! The upcoming SING-OT website will provide you with resources and songs to help your students <i>Unpack, pack-up, wash hands, line up...</i>and more!</p> <p>RL 7.3</p> |
| School Administrators |
| <p>Dear school leaders:</p> <p>Are you looking for new ways to engage your students while improving learning outcomes? Have you considered the benefits of music in your classrooms? How about</p> |

song-based interventions to help your students make gains in their occupational therapy goals and other important childhood areas? SING-OT is an innovative, student-centered, and evidence-supported program that was developed by an occupational therapist. The program provides access to songs that help young children with autism spectrum disorders (ASD) and related disabilities navigate the personal and contextual barriers to participation. The program is designed to improve outcomes in activities of daily living (ADLs) for preschool children. If you would like to learn more, we welcome an invitation to your next staff development or teacher meeting. We would love to show you how SING-OT can help make a difference in your program!

Music Therapy Consultants and Researchers

Dear music therapy partners:

In the realm of music therapy, evidence supports the use of music to support people with accomplishing individual and group goals. Have you ever considered collaborating with occupational therapy practitioners (OTPs) who use music creatively to support their client's performance while achieving their meaningful goals? SING-OT is an innovative, client-centered, and evidence-supported program that utilizes songs to promote learning, participation, and performance in meaningful activities of daily living (ADLs) for young children with disabilities. Through the program's initial feasibility study, student participants are expected to demonstrate positive outcomes after participating in a song-based intervention designed to improve performance in a common personal hygiene and grooming task. How would you like to join the efforts of promoting interprofessional collaboration while improving outcomes for children

with disabilities through music? We welcome an invitation for a conversation to learn more about the program and to discuss potential benefits of collaborating on future research opportunities.

Sources/ Messengers

For each audience group listed in Tables 6.3 - 6.5, the author identified key spokespersons to deliver messages for the SING-OT program. The author will be the primary spokesperson when communicating with OTPs. As an OTP who has worked with children and frequently utilize songs in practice, the author believes that self-delivery will enable the message to be communicated with knowledge, expertise, and a level of passion that may resonate with other OTPs. In addition, the author will consider pre-recorded video testimonials from other pediatric OTPs who have or currently use songs to support their clients with engaging childhood occupations. Furthermore, the author will collaborate with other experts in the field such as Dr. Ana Brussa, OTR, OTD. Dr. Brussa is Director of Quality Assurance Performance Improvement (QAPI) for a pediatric home and health care organization in Austin, Texas. She has agreed to support the program's initiatives through testimonials and collaboration on future song development in other languages (i.e., Spanish).

Communication with parents and caregivers will be key to dissemination of program results and benefits. The author will collaborate with parents of children with ASD or similar disabilities who are willing to share their story through a quick video share. These video shares will be combined with a live presentation to be delivered by the

author at local schools or other community-based childcare centers. The purpose of these presentations would be to inform and educate caregivers about the benefits of evidence-supported, song-based interventions that address ADLs. The author will also consider small video clips with examples of song-based interventions in action to post on social media groups and other platforms to share program results and upcoming activities.

The author will request support from childhood educators who have used or currently use songs to support their students during classroom occupations. These representatives will help to communicate the benefits and effectiveness of using songs to support student participation and performance to other educators based on lived experience. The message may be delivered in-person or via a short video-clip of an actual classroom scenario. The author will obtain media consent for children who are featured in the video recordings.

When communicating with school administrators, the author will be the primary spokesperson. The author feels that the relationships which she has developed with administrators from current and previous places of employment will help to facilitate an initial conversation about this innovative program. Finally, the author will request support from a music therapy expert and researcher who is interested in the program's results and is willing to support with promoting interprofessional collaboration between OTPs and music therapists through research-based activities.

Dissemination Activities

Dissemination activities for the SING-OT program will vary based on audience member or stakeholder group. The author will consider various dissemination activities

such as person-to-person contact, electronic media (recorded and live), and print materials. For example, activities to reach OTPs will include website promotion ads on social media, in-person team meetings at the author's primary place of employment, web-based surveys, and short video messages online. Parents and caregivers will be reached primarily through short-video shares online, in-person information sessions during parent meetings, and web announcements on parent-based or special-needs advocacy groups on social media. Primary outreach activities for teachers, school administrators, and music therapy experts will include short introductory meetings (in-person, on-line, phone), short brochures, and guest lecturing opportunities at a music therapy and special education programs. A detailed description of dissemination activities with costs associated to develop and implement them are provided in Table 6.6.

Table 6.6

Dissemination Activities and Costs

| Category | Activities | Target Audience | Year 1 Cost | Year 2 Cost |
|--------------------------|--|--|---------------------|---------------------|
| Person-to-Person Contact | <ul style="list-style-type: none"> Online guest speaker or lecture at OT special education programs | <ul style="list-style-type: none"> OTS, OTPs Special education teachers | \$ 150.00 | \$ 150.00 |
| | <ul style="list-style-type: none"> Live Zoom meetings | <ul style="list-style-type: none"> School administrators Music therapy consultants and researchers | \$0 | \$0 |
| | <ul style="list-style-type: none"> Live presentations at local schools and childcare centers | <ul style="list-style-type: none"> School administrators Parents/caregivers | \$1,200.00 (travel) | \$1,200.00 (travel) |

| | | | | |
|------------------|--|--|---------------------------------|---------------------------------|
| | <ul style="list-style-type: none"> • Presentation during staff development or parent meetings | <ul style="list-style-type: none"> • Teachers | \$400.00 (food/ beverage) | \$400.00 (food/ beverage) |
| | <ul style="list-style-type: none"> • Poster presentation at state or national OT organization | <ul style="list-style-type: none"> • OTPs | - | \$1,500.00 |
| Electronic Media | <ul style="list-style-type: none"> • Video testimonials • Video ads • Social media print ads • Video demonstrations • Web-based surveys | <ul style="list-style-type: none"> • Parents/ caregivers • OTPs • Teachers | - | \$500.00 |
| Print Materials | <ul style="list-style-type: none"> • Brochures • Fact Sheets • Publish article in free web-based parent magazine (i.e., <i>Exceptional Needs Today</i>) | <ul style="list-style-type: none"> • School administrators • Parents/ caregivers • Other professionals who work with children | \$450.00 | \$450.00 |
| Other | <ul style="list-style-type: none"> • Letter of interest to consult with large media companies (i.e., Sesame Workshop) | <ul style="list-style-type: none"> • Media organizations that support child development | \$0 | \$0 |
| | | | \$2,200.00 | \$4,200.00 |
| | | | Total Cost: | \$6,400.00 |

Table 6.6 outlines estimated costs associated with dissemination activities over a two-year span for the SING-OT program. Costs provided include all components related to developing and delivering the activities. Examples include travel, accommodations, food, and beverages served at information sessions or parent meetings, printing costs, among others.

Assessment of Effectiveness

Dissemination activities can be measured in various ways. Examples include web-based surveys of user experience, web-based tracking tools, number of views and comments on website or social media posts, requests to attend a presentation at local schools or other childcare organizations, the number of meetings with key stakeholders, and number of collaborative activities developed because of dissemination activities. The author will consistently evaluate activities and adjust where necessary to assure reach, motivation, and adoption of the SING-OT program by other organizations.

Conclusion

The SING-OT program is an innovative, evidence-supported, and occupation-inspired educational intervention program that proposes positive outcomes through use of its songs to support performance and participation in meaningful childhood occupations. This chapter provided an overview of the program, dissemination goals, target audience members, key messages, and a detailed description of dissemination activities with an estimation of associated costs. Dissemination messages were included with consideration of members individual differences related to literacy levels. The author included primary, secondary, and tertiary audience members as she believes it is through the relationships with these key members would the program thrive and achieve intended goals.

CHAPTER SEVEN – Funding Plan

Introduction

The Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT) program is an educational intervention program that aims to improve performance outcomes in activities of daily living (ADLs) among preschool children with autism spectrum disorder (ASD) and related disabilities. The program will launch in three phases that focuses on promoting awareness of the evidence-based use of songs (Phase 1), testing effectiveness of an originally composed song with evidence supported musical elements to measure task completion in a common grooming and personal hygiene task (Phase 2) and creating opportunities for caregiver training to support performance in meaningful occupations (Phase 3). This funding plan will target activities within Phases 2 and 3 of program development.

Available Local Resources

Resources for SING-OT include access to community members and key stakeholders, a school-based setting, time devoted by the author to developing the program, lyrics to originally composed songs, electronic devices (notebook computer) with reliable Wi-Fi access and iCloud back-up, and access to student participants' individualized education plans. It is understood that current resources may change over time. Factors that may impact resources include availability of key stakeholders, needs and feasibility with conducting a formal research study within the proposed setting, availability of study personnel, and differences between the program's proposed timeline and the actual timeframe that the program may require to facilitate the intended activities.

An overview of program resources is provided in chapter four, Figure 4.4.

Needed Resources: Budget

Table 7.1

Proposed Year One and Two Budget for the SING-OT Program: Website (Phase 1)

| Phase 1 | | Year 1 | Year 2 |
|-------------------------------------|---|------------------------------|---------------------|
| | | Website Development & Launch | Website Maintenance |
| Item | Description | Cost | Cost |
| Website | The SING-OT website will require the following resources and supports: | | |
| | <ul style="list-style-type: none"> Webhosting IONOS webhosting (12 months) | \$ 60.00 | \$ 120.00 |
| | <ul style="list-style-type: none"> Domain name (First 12 months) | \$1.00 | \$15.00 |
| | <ul style="list-style-type: none"> SEO optimization- provided as add on to the website package (12 months) | \$120 | \$120 |
| | <ul style="list-style-type: none"> Website analytics- provided as part of website package | \$0 | \$0 |
| Web Design and Maintenance | The author will design and maintain the website using a pre-formatted template provided by the selected webhosting service. | \$0 | \$0 |
| Copyright Application (song lyrics) | Single application filing fee for up to 10 unpublished song lyrics or songs. | \$35.00 | - |
| Song Lyrics | The author will utilize originally composed song lyrics to address an ADL activity. | \$0 | \$0 |
| Song Recording/ Production | Average cost to produce one song using a quality local/ home recording studio. (Year 1, Song 1; Year 2, Song 2) | \$2,000.00 | \$2,000.00 |
| Time | Author: Development of all activities. Honorarium. | \$5,000.00 | \$5,000.00 |

| | | | |
|-------------------------|--|-----------------------|--------------------|
| | IT consultant: Assists with website needs. Honorarium. | \$3,000.00 | \$3,000.00 |
| | Four children volunteers: Recruited to be featured in song demo videos. Will be paid a stipend of \$50 per video. | - | \$200 |
| Survey Development | Initial and ongoing surveys will be developed using fillable, electronic Google form to obtain initial interest and provide formative and summative data regarding user experience with web resources. | \$0 | - |
| Expert music consultant | Supports with advising and assessing musical elements within songs. Honorarium. | \$1,500.00 | \$1,500.00 |
| Recorded SING-OT Video | The author will develop and edit YouTube videos of select songs on the website using free video editing applications (i.e., iMovie) | - | \$0 |
| Language Interpretation | The author will pay a consulting stipend for bilingual interpretation of songs to be recorded in other languages (e.g., Haitian-Creole, Spanish). Fee paid per song. | - | \$175.00 |
| | | \$11,716.00 | \$12,130.00 |
| | | Phase 1 Total: | \$23,846.00 |

Table 7.2*Proposed Year Two Budget for the SING-OT Program: Effectiveness Study (Phase 2)*

| Phase 2 | | Year 1 | Year 2 Effectiveness Study |
|------------------------------------|---|--------|----------------------------------|
| Item | Description | | Cost |
| Electronic Music Playing Devices | Portable devices to play-recorded music during study (3 total). Product name: MP3 Player Bluetooth 5.0 (\$39 each) | - | \$117.00 |
| Portable Data Recording Device | iPad or similar devices to record data during study. Product name: iPad mini, 256 GB with Wi-Fi (3 at \$500.00 each) | - | \$1,500.00 |
| Video Recording Device | To be used while study participants are performing the grooming/ hygiene task. Product name: Kimire Digital Camera Recorder Full HD (3 at \$66.00 each) | - | \$198.00 |
| Tripod Stand | To stabilize recording camera during study. Product name: Amazon Basics 50-inch Lightweight Camera Mount Tripod Stand with Bag (3 at \$15.00 each) | - | \$45.00 |
| Memory Card | Stores recorded data for analysis. Product name: SanDisk 128GB Ultra SDXC UHS-I Memory Card (3 at \$18.00 each) | - | \$54.00 |
| Survey Generating Software | Qualtrics basic package (\$30/month) | - | \$360.00 |
| Cloud-based Data Analysis Software | The author will consider Dedoose or similar programs to analyze study data \$10.95/ month (6 + users) | - | \$132.00 |
| OTPs Delivering Intervention | Two OTPs who will assist with delivering the | - | \$1,000.00 |

| | | | |
|---|--|---------------------------------|--------------------|
| | intervention will receive a stipend of \$500/ each | | |
| Author/ Primary Investigator | Oversees all components of the study. Honorarium. | - | \$5,000 |
| IRB application | The author will apply for IRB approval under an affiliated organization or academic institution. | - | \$0 |
| Research Assistants | The author will employ 3 research assistants to assist with research activities. Stipend: \$500/each | - | \$1,500.00 |
| Research support consultant | A stipend will be paid to a research support consultant to assist with research activities and data analysis. | - | \$1,500.00 |
| Trained observers | The author will pay up to three trained observers a stipend to assist during study implementation. Stipend: \$300/each | - | \$900.00 |
| CITI Human Subject Protection Training: Social & Behavioral Focus | To be provided to all study personnel. (\$29 each) | - | \$290.00 |
| Evaluations | Pediatric Evaluation of Disability Inventory (PEDI)- Print format | - | \$162.00 |
| Trainings | Formal trainings by the author to all study personnel. Estimated cost of resources needed to develop resources and facilitate trainings. | - | \$3,000 |
| | | Phase 2 Total: | \$15,758.00 |
| | | Total Dissemination Cost | \$6,400.00 |
| | | Total Program Cost | \$46,004.00 |

Tables 7.1 and 7.2 outlines the total estimated cost of \$46,004.00 associated with developing and disseminating program activities over a two-year period. The *Items* category includes materials, equipment, and personnel needed to implement activities within each phase. The *Description* column provides a brief overview of each item. The costs are estimated and based on current pricing. Variations in pricing may occur based on current market value and potential for donated time by the author and program consultants. Please see chapter 6, Table 6.6 for a detailed description of dissemination activities and costs.

Potential Funding Sources

Potential funding sources for the SING-OT program might include crowdfunding, community grants, and other funding opportunities that are committed to supporting the needs of young children and their families or that focus on the development of minority and women business owners. Examples include a GoFundMe page to kick start the program's initial activities such as the production and composition of songs (GoFundMe, n.d.). This platform may also be used as a promotional initiative to inform community members of the upcoming project. Community grants through the author's home county that focus on supporting underserved children and caregiver supports will also be considered. An example is the Agency Partner Grant Program in Dutchess County, NY (Dutchess County Government, n.d.). According to their 2022 grant funding summary, awards were provided to organizations in the amount of up to \$100,000 (Dutchess County Government, n.d.). The author will partner with a local non-profit educational agency who is willing to support the SING-OT program through this funding

opportunity. Lastly, funding sources such as Hello Alice provides funding opportunities to minority and women small business owners (Hello Alice, 2022). The author would apply for funding opportunities through her private practice organization.

Additional funding sources are outlined in Table 7.3. These potential grant opportunities are listed with a brief overview in the *Descriptions and Requirements* column. Detailed information can be found on the funder's website in the links provided. The author recognizes that most of the funding opportunities may require application from an established or affiliated not-for-profit organization. Therefore, efforts will be made to form community coalitions that support the shared mission and values of the SING-OT program. If funding goals are not met as anticipated, the author will modify the plan into smaller stages. It is understood that this may extend the anticipated timeline for program development. However, the author believes that this project is an investment that will have a positive impact in the lives of children with disabilities and their caregivers.

Table 7.3*Potential Funding Sources for the SING-OT Program*

| Funding Source | Description and Requirements | Amount |
|--|---|---|
| Primary | | |
| GoFundMe | <ul style="list-style-type: none"> • Crowdfunding source open to the public • Designed to support individuals with raising money for various events https://www.gofundme.com/discover | Unspecified |
| Agency Partner Grant Program (Dutchess County, NY) | <ul style="list-style-type: none"> • Various funding opportunities for grant seekers in Dutchess County, NY • Provided to organizations that aim to fulfill an unmet community need https://www.dutchessny.gov/Departments/Planning/Agency-Partner-Grant-Program.htm | Varies. Most recent awardees received up to \$100,000 |
| Hello Alice | <ul style="list-style-type: none"> • Offers various small business funding • Example: Antares REACH Grant Program for underrepresented entrepreneurs supporting their communities https://helloalice.com/grants/antares-capital/ <ul style="list-style-type: none"> • Grant closing date: 07/15/2022 | \$20,000 |
| Additional Sources | | |
| W.K. Kellogg Foundation | <ul style="list-style-type: none"> • Provides funding to organizations within the 50 states and in countries such as Haiti and Mexico • Potential Grant Opportunity: <i>Every Child Thrives</i>- aims to support a healthy start and quality learning experiences for children • No application deadlines https://www.wkkf.org/grantseekers?#overview https://www.wkkf.org/who-we-are/overview?#mission-vision | Unspecified |

| | | |
|---|---|--------------------|
| New York Foundation for the Arts | <ul style="list-style-type: none"> • NYC Women’s Fund for Media, Music, and Theatre • Supports the creation of music and arts content by persons who identify as women • Provides funding for the creation of music recordings or videos https://www.nyfa.org/awards-grants/nyc-womens-fund-for-media-music-and-theatre/ | \$20,000 (maximum) |
| Robert Wood Johnson Foundation | <ul style="list-style-type: none"> • Potential Grant: <i>Pioneering Ideas: Exploring the Future to Build a Culture of Health</i> • Supports innovative programming that promotes healthy futures and health equity • Awarded to individuals or organizations https://www.rwjf.org/en/library/funding-opportunities/2020/pioneering-ideas-2020-exploring-the-future-to-build-a-culture-of-health.html | Unspecified |
| U.S. Department of Education Office of Special Education Programs (OSEP) | <ul style="list-style-type: none"> • Potential Grant: <i>Preschool Grants for Children with Disabilities</i> • Formula grants awarded to local education agencies that supports the needs of young children with disabilities within their state https://www2.ed.gov/programs/oseppsg/index.html | Unspecified |
| Cigna Foundation | <ul style="list-style-type: none"> • Potential Grant: <i>Education and Workforce Development Grant</i> • Supports grant seekers committed to serving vulnerable communities • Applicants must be a registered 501(c)(3) not-for-profit https://www.cigna.com/about-us/corporate-responsibility/education-and-workforce-development | \$50,000–\$125,000 |

Conclusion

This funding plan provided an overview of the SING-OT program. Current and available resources, budget, and potential funding sources were described. Needed resources were outlined in Tables 7.1 and 7.2 with estimated costs based on current pricing. During program phases, the author will consider donated time in exchange for compensation. Potential funding sources, outlined in Table 7.3, include crowdfunding, local community grants, state, federal, and private funding sources. The author will consider establishing relationships with local educational agencies by which funding sources can be applied under to support the development and activities within the SING-OT program. The author believes that this program has the potential to change the lives of children with disabilities and their families. Therefore, a carefully crafted funding plan with strategic marketing activities will be implemented to promote awareness and develop interest among key stakeholders.

CHAPTER EIGHT – Conclusion

Children with disabilities often require adult support when participating in their childhood occupations. This author introduced a way to help children not only participate and perform these meaningful activities, but to have fun while doing so. In this doctoral manual the author presented a proposal for an innovative, music-based educational intervention program that aims to improve the well-being of young children with disabilities. Using occupation-inspired songs, the program will support preschool children with autism spectrum disorder (ASD), and related disabilities, improve their participation in important activities of daily living (ADLs).

Through a multi-phased program, Song-based Interventions for Navigating Gains in Occupational Therapy (SING-OT) will provide occupational therapy practitioners (OTPs) with access to valuable resources to support their client's goals. Examples include educational resources connecting evidence to music-based interventions (songs) and access to originally composed songs containing unique musical elements to support student performance. In addition, a feasibility study will be conducted, examining the effectiveness of activity completion using a song that addresses a common personal hygiene and grooming task within a preschool setting. Lastly, future developments will extend to creating training opportunities to support caregivers. This doctoral manual focused on the online educational resources with access to songs, and the plan for the proposed feasibility study.

OTPs are skilled and trained in supporting clients in activities that they want, need, and desire to do. SING-OT uses a client-centered, strengths and interest-driven

approach, that recognizes the assets or gifts which each client brings to the therapeutic relationship. The author encourages interprofessional collaboration with other professionals such as licensed music therapists, speech and language pathologists, and teachers. In addition, including caregivers and students as partners in their care may lead to more successful outcomes towards their meaningful goals. SING-OT provides an opportunity to support improving ADL outcomes for preschool students with disabilities through an evidenced supported, engaging, and meaningful way. The author hopes that through the SING-OT program, more OTPs will be encouraged to use song-based interventions and collaborate with other professionals in making a difference in the lives of young children with disabilities.

APPENDIX A – Individual Strengths and Skills Inventory

Individual Strengths and Skills Inventory

Ruth Aspy, Ph.D., and Barry G. Grossman, Ph.D.

When designing an effective intervention plan, it is important to consider individual strengths. Please describe strengths in the following areas:

Social

Behavior, Interests, and Activities

Communication

Sensory

Cognitive

Motor

Emotional

Biological

From Aspy, R., & Grossman, B. G. (2011). *The Ziggurat Model*. Shawnee Mission, KS: AAPC Publishing; www.aapcpublishing.net; used with permission.

APPENDIX B – Handwashing Song Lyrics

Handwashing Song Lyrics

Rub your hands together to wash your hands

Rub your hands together to wash your hands

Wash the back

The other back

Fingertips

Quack, Quack, Quack

Adams, R. (2022). Handwashing Song [Song].

APPENDIX C – Sample OTP Interest Survey Questions

Sample OTP Interest Survey Questions

| | |
|---|--|
| <p>Thank you for your interest in helping us to understand how OTPs use music-based interventions to support clients with participating and performing their activities of daily living (ADLs). Please take a few minutes to complete this brief eight question survey. The estimated time to complete this survey is five minutes. However, you may take additional time if needed or return to complete it later.</p> | |
| <p>1. What is your primary practice setting?</p> | <input type="checkbox"/> Community-based (e.g., daycare center, home, etc.) |
| | <input type="checkbox"/> School |
| | <input type="checkbox"/> Other: |
| <p>2. Select your client age group</p> | <input type="checkbox"/> Preschool (3-5) |
| | <input type="checkbox"/> School Age (5-11) |
| | <input type="checkbox"/> Older: _____ (specify age range) |
| <p>3. Describe your client population (<i>Select all that apply</i>)</p> | <input type="checkbox"/> Autism |
| | <input type="checkbox"/> Other developmental disabilities |
| | <input type="checkbox"/> Multiple disabilities |
| | <input type="checkbox"/> Other: _____ |
| <p>4. In what ways do you support your client's participation during ADLs? <i>Select all that apply</i></p> | <input type="checkbox"/> Physical support (e.g., hand over hand, tactile cues) |
| | <input type="checkbox"/> Visual support (e.g., demonstrations, picture charts) |
| | <input type="checkbox"/> Verbal |
| | <input type="checkbox"/> Other: _____ |

| | | |
|--|--|-----------------------------|
| 5. How often do you use songs during sessions? | <input type="checkbox"/> Very Often | |
| | <input type="checkbox"/> Somewhat Often | |
| | <input type="checkbox"/> Rarely | |
| | <input type="checkbox"/> Never | |
| 6. In what ways do you use songs? | <input type="checkbox"/> I sing to or with my clients | |
| | <input type="checkbox"/> I play songs on an electronic device | |
| | <input type="checkbox"/> I do not use songs | |
| 7. Are you interested in exploring new interventions to support your clients during ADLs? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| 8. Are you interested in learning more about evidence supported, song-based interventions to support your clients during ADLs? | <input type="checkbox"/> Yes | <input type="checkbox"/> No |
| Please let us know if you have any questions or would like to know how OTPs might use music-based interventions in your area of practice. | Enter your name, contact information, and contact preferences (email, text, other) | |
| Thank you for your participation. Your time is greatly appreciated. For questions on this survey, please contact the author at roseadamsot@gmail.com | | |

APPENDIX D – Sample Observational Scale

| Task: Handwashing | Rating Scale | | | Comments (Amount of time to complete task, behavioral observations) |
|--|---|--------------------|--|--|
| | Does Not Perform | Performs With Help | Performs Without Help | |
| <i>Place a check mark ✓ in the boxes that best represent the child's performance.</i> | | | | |
| Steps | | | | |
| 1. Obtains Soap <i>Extends hands to obtain soap from dispenser or soap bottle</i> | | | | |
| 2. Rubs Hands Together <i>Uses a rubbing motion to rub hands together including back of hands and fingertips</i> | | | | |
| 3. Rinses Hands <i>Places hands under water to rinse</i> | | | | |
| 4. Dries hands <i>Uses paper towel, clean napkin, or places hands under air dryer to dry both hands</i> | | | | |
| Set-up Items | | | | |
| Turns water on and off <i>Holds and manipulates faucets (pushes down, turns knob or lever)</i> | -- | -- | -- | |
| Obtains paper towel <i>Reaches for and grabs paper towel</i> | -- | -- | -- | |
| Scoring | # Of Steps with help: ____/ 4 | | # Of Steps without help: ____/ 4 | |
| | Percentage Completed | | | |
| | ____(%) | | ____(%) | |
| Summary of Observations: | | | | |

Adams- Scale of Hygiene Independence for Preschoolers (A-SHIP) R. Adams, 2021

Rating Scale:

Does not perform: Child does not initiate or is unable to initiate task when prompted

Performs with help: Child needs spoken, visual, or physical prompts to perform task

Performs without help: Child performs task without spoken, visual, or physical prompts

Adams- Scale of Hygiene Independence for Preschoolers (A-SHIP)

Task: Handwashing

Description:

The Adams-Scale of Hygiene Independence for Preschoolers (A-SHIP) is an observational scale that can be used to easily assess performance in personal hygiene and grooming tasks among preschool children. It is designed to be used with the Song-Based Interventions for Navigating Gains in Occupational Therapy (SING-OT) program. This scale can also be used as a general measure to assess level of mastery or independence in ADL performance.

Descriptive Rating Scale

Child does not initiate or is unable to initiate task when prompted

Child needs spoken, visual, or physical prompts to perform task

Child performs task without spoken visual, or physical prompts

Instructions

Using the descriptive rating scale, measure the child's performance in all steps. Ratings are permitted for *set-up* items, but they are *not* factored into the total score. Use the *comments* section to add additional information such as the amount of time needed to complete each step and other behavioral observations (e.g., level of engagement, additional support provided, etc.).

Scoring

1. Calculate the number of steps (check marks) completed for items in the ***performs with help*** and ***performs without help*** sections.
2. Transfer scores from steps 1-4 to the *# Of Steps* boxes.
3. The maximum number of steps will be 4.
4. Use the chart below to record the percentage (%) of steps completed. This helps to determine the level of mastery or independence in the targeted ADL task.

| Converting Total Steps Completed to Percentage of Steps Completed | |
|---|-------------------|
| Total Steps Completed (Number of steps completed) | % Steps Completed |
| 0 | N/A |
| 1 | 25% |
| 2 | 50% |
| 3 | 75% |
| 4 | 100% |

APPENDIX E – Executive Summary

Introduction: The Problem

Children with disabilities often require additional support to perform and participate in important life activities (CDC, n.d., Gronski & Doherty, 2019; Lee, 2018). Difficulty managing tasks such as caring for oneself may negatively impact the child (Gronski & Doherty, 2019). Therefore, creating opportunities to help children engage in their occupations, contributes to improved overall health and well-being (Laverdure & Beisbier, 2021). The evidence-based literature supports considering new, fun, and engaging ways to help young children with disabilities feel more confident and successful when doing the things that they want, need, and desire to do (AOTA, 2013; Bonnel, 2020; Kocabas & Ozeke, 2012; Laverdure & Beisbier, 2021).

Inspiration and Solution

Occupational therapy practitioners (OTPs) have a distinct role in helping to develop new and exciting ways to help young children with disabilities live meaningful lives (AOTA, 2020). Inspired by a young client who had difficulty putting on their socks during therapy sessions, the author created a song that helped her client succeed with performing this important dressing skill. SING-OT stands for Song-based Interventions for Navigating Gains in Occupational Therapy. The SING-OT program will use songs developed by an OTP to assist young children with Autism and other related disabilities perform and participate in important activities of daily living (ADLs).

It is likely that people benefit most from interventions that value their strengths, interests, and supports their needs (Armstrong, 2017; Aspy & Grossman, 2011). Through

an evidenced-supported, strengths and interest-driven approach, the SING-OT program will utilize music in the form of songs to help young children with disabilities improve their participation and performance in ADLs. These occupation-inspired songs will contain unique musical elements (Gardiner & Thaut, 2016; Thaut et al., 2014) and composed in the form of modified activity analyses to address client's goals.

Program Goals and Audience

The overall goal of the SING-OT program is to improve student outcomes through song-based interventions provided by OTPs. With an initial focus on preschool children, the author will address common ADLs for the preschool child such as handwashing, dressing, brushing one's own teeth, feeding, and more. The SING-OT program will provide OTPs with access to songs as an additional intervention tool that supports their young clients with achieving their goals. Hosted on an online platform, the program will also provide educational resources on song-based interventions for OTPs, other professionals, and caregivers who are interested in using innovative ways to help young children succeed. Future program goals will include songs translated in other languages, as well as opportunities to support caregivers through training activities. Figure 1 provides a visual overview of how the SING-OT program will support young clients through song-based interventions.

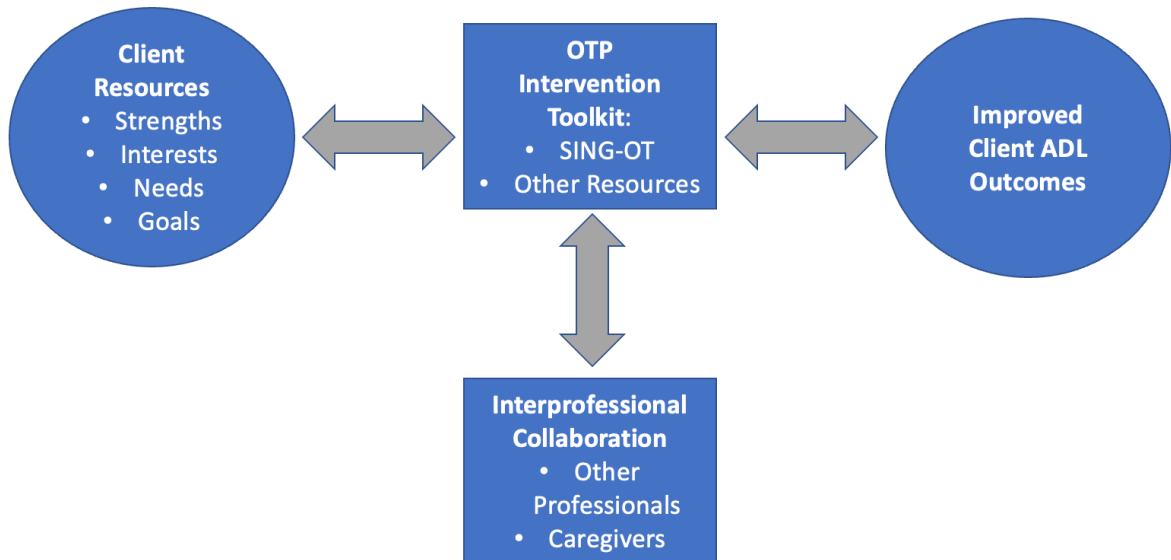


Figure 1. A visual summary of the SING-OT program.

Key Messages

The key message to the target audience includes:

- Children with disabilities often need support to successfully perform and participate in necessary and desired occupations
- OTPs are skilled clinicians who can develop interventions that value and respect the client's interests, strengths, needs, and goals
- New, fun, and engaging interventions are beneficial
- Songs containing evidenced-supported musical elements can help children succeed
- OTPs, other professionals, and caregivers can benefit from SING-OT

Recommendations

The SING-OT program provides an innovative way for music to be incorporated during occupational therapy sessions. However, it is understood that there may be

hesitation at first with trying a new intervention. Therefore, the program aims to not only share resources that connects evidence to song-based interventions but will provide OTPs with access to songs that they might use when supporting their young clients with disabilities. The program intends to offer these resources as part of the solution when addressing difficulties with performing and participating in important childhood occupations. Furthermore, to effectively address the unique needs of our clients, the author encourages interprofessional collaboration to intervention planning.

Conclusion

SING-OT is an innovative educational intervention program developed by the author to help support young children with disabilities navigate challenges associated with doing what they want, need, and desire to do. Through an evidence-supported approach, the program will provide resources on music-based interventions and access to originally composed songs that address common ADLs for young children. These resources will be particularly helpful to practicing occupational therapy practitioners (OTPs), parents and caregivers, and other professionals who are committed to making a positive impact in the lives of children with disabilities.

The author hopes to increase knowledge on the evidence-based literature supporting song-based interventions, provide access to occupation-inspired songs, encourage interprofessional collaboration, and evidently create opportunities to improve school-based ADL outcomes for preschool children with ASD and related disabilities. Finally, the author hopes that through this program, OTPs would consider using SING-OT when helping their clients navigate and make gains towards their goals. Thank you

for considering SING-OT!

APPENDIX F – Fact Sheet



**BOSTON
UNIVERSITY**

SING-OT:
Song-based
Interventions for
Navigating Gains in
Occupational Therapy

Rose Adams, MS,
OTR/L

What is SING-OT?

Innovative. Music-based. OTP Created.

- Music-based educational intervention program
- Supports the performance and participation needs of young children with disabilities
- Utilizes occupation-inspired and evidence-supported songs
- Provides a motivating and engaging way for children to participate in their activities of daily living (ADL)!
- Provides free access to originally composed songs and evidence-based resources on an online platform
- Developed by an occupational therapy practitioner (OTP) for OTPs
- Beneficial for teachers, other professionals, and caregivers

“SING-OT is for OTPs and others who are committed to making a positive impact in the lives of children with disabilities.” (R. Adams)



(Changing Lives OT, n.d.)

Why SING-OT

The Problem

- One in six children between the ages of three and seventeen are identified with having a developmental or behavioral disability (CDC, n.d.).
- Performance in important ADLs such as toileting may be delayed or not achieved (Gronski & Doherty, 2019).
- Difficulty managing tasks such as caring for oneself may negatively impact the child (Gronski & Doherty, 2019).

Evidence & Impact

Join the SING-OT Movement

- People are likely to benefit from interventions that value their strengths, interests, and supports their needs (Armstrong, 2017; Aspy & Grossman, 2011).
- Interventions that support engagement in meaningful and necessary childhood occupations may improve health and wellness outcomes (Laverdure & Beisbier, 2021).
- Songs containing evidence-supported musical elements can help children succeed (Gardiner & Thaut, 2016; Thaut et al., 2014).
- OTPs are skilled clinicians who can develop interventions that value and respect client's interests, strengths, needs, and goals.
- SING-OT can help improve preschool student's ADL outcomes.
- SING-OT provides free access to key resources and songs to address common childhood occupations.
- SING-OT is for OTPs and others who are committed to making a positive impact in the lives of children with disabilities!



(DKOL Photography, n.d.)

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