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**Music as a Gateway to Healing Speech Disorders and Mental Health
Holistically in the Patient with Aphasia: A Literature Review**

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Thesis Seminar

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Abstract

People with some types of post-stroke aphasia often experience depression as well as loss of speech. Music therapy has unique properties that allow it to be used therapeutically to treat both speech impairment and depression yet it is rarely used to treat both disorders. This literature review seeks to examine the underlying causes for this discrepancy, review methods used by practitioners to treat both disorders and suggest future directions for additional research and implications for the treatment of patients with aphasia who have both language impairment and depression.

Introduction

Aphasia is an impairment of language usually caused by an injury to the brain such as a stroke, head trauma, brain tumor, or infection. There are several types of aphasia resulting in different aspects of language impairment as illustrated in Appendix A. This paper is concerned primarily with non-fluent aphasia (Broca's aphasia) which usually presents with mostly preserved comprehension but impaired language fluency, the ability to put thoughts into words and speech is often limited to utterances less than four words (National Aphasia Foundation (n.d.) *Aphasia Definitions* <https://www.aphasia.org/aphasia-definitions/>).

Depression frequently co-occurs with loss of speech in patients diagnosed with post-stroke aphasia due to brain damage affecting neuronal processes and neurobiochemical pathways underlying normal emotion (Code & Herrmann, 2003). The American Psychiatric Association Diagnostic and Statistical Manual lists such a disorder as depressive disorder due to another medical condition (F06.32) (American Psychiatric Association [APA], 2013). A review of the literature suggests that depression in patients with aphasia is typically caused by loss of human connection and community that occurs with loss of language, and also loss of patient agency and prior self-identity pre-stroke.

Depression can negatively affect an aphasia patient's motivation to comply with and benefit from speech-language therapy. Despite this, depression in patients with aphasia often goes untreated and there is little research that has investigated whether treating aphasia patients' feelings of isolation, loss of identity and agency in combination with speech-language therapy will result in improved recovery of speech. The literature further suggests that music can help

restore this sense of loss for these patients and that music is unique in being a modality that can address both the treatment of language rehabilitation and also depression.

This paper seeks to understand why depression is undertreated in such patients and why music therapy is not used more broadly to treat both language rehabilitation and also depression in patients with aphasia. This question is important because of the negative impact depression has on the lives of patients who have lost their ability to speak as a result of aphasia.

Additionally, it is important because this may be an underserved opportunity for expanding the use of music therapy for patients experiencing aphasia.

My hypothesis is that patients experiencing non-fluent aphasia will recover faster if their treatment includes use of music not only for language restoration but also for restoration of identity, and reduction of feelings of isolation and depression. In exploring this hypothesis, this paper presents an overview of current treatments for aphasia and depression and a review of past approaches and barriers to using music to treat the patient's speech and depression holistically, including unresolved challenges for applying music therapy for both areas of clinical practice. The paper concludes with a recommendation that further studies need to be done to investigate whether using music therapy methods in combination for language rehabilitation and depression would show improved outcomes for patients with aphasia.

Literature Review

A review of the literature was chosen for this capstone thesis because this author observed in her music therapy internships that depression appeared to be undertreated in patients with aphasia. It was also observed that the emotional state of a client experiencing depression sometimes interfered with language rehabilitation therapy and the client's quality of life. After

completing some preliminary research, it appeared that there was not much published about depression in patients with aphasia or how music therapy could be used to treat depression in these patients. A literature review was therefore chosen in order to summarize what is known in the literature about this topic.

Methods

The approach used in this literature review was to identify contextually relevant quantitative, qualitative, and arts-based research on this topic and suggest new directions for research and practice. The principal sources for this literature review include peer-reviewed published articles, prominent authors' books on music therapy and mental health, the Cochrane Library database, class materials and conference materials. Search terms included aphasia, depression, music and medicine, neurology, neurological treatments and aphasia, music therapy and aphasia, music therapy and depression, music therapy, psychiatry and psychological therapy.

Sources were prioritized based on relevance to the topic under investigation and recency of date. Additional factors include the prominence, readership and professional standing of the journal or publication in which the article appeared and the number of times the source has been cited in the literature. References cited in all publications were followed up and included if found pertinent to this investigation. Also included are insights from conversations held with professors from Berklee and Lesley universities.

Results

The results of the literature review are summarized below and include an overview of therapies for aphasia, clinical incidence and causes of depression in aphasia, why treating depression is important in this population, methods and collaborative models for treating

depression in people with aphasia, descriptions of music therapy methods used for aphasia in this population, and issues and challenges with current treatment methods.

Overview of Therapies for Aphasia

Aphasia occurs in approximately 25-40% of stroke survivors (National Aphasia Association, n.d.). Factors influencing recovery from aphasia include age, gender, handedness, education, location and severity of the damage in the brain, motivation and emotional support (Watila & Balarabe, 2015). There are many therapies both currently in use and in development for subacute (7 days to 24 weeks) and chronic (> six months) aphasia. Most treatments fall into one of two models: the medical model or the social model (Wood et al., 2019). The medical model “view(s) aphasia as an illness, the therapy as a means towards ‘cure,’ and position(s) the clinician as prescriptive towards the patient” (Wood et al., 2019, p. 2). Examples of this are constraint-induced language therapy (CIT) and Melodic Intonation Therapy (MIT) which is described in more detail below. The social model focuses on the patient’s functional communication within their community and environment.

Social Model Treatments

The Life Participation Approach to Aphasia (LPAA) and Promoting Aphasics’ Communication Effectiveness (PACE) are examples of the social model treatment approach (Wood et al., 2019). LPAA is a collaborative treatment involving the person with aphasia, their family and the speech-language pathologist (SLP) who work together to identify how communication impacts the life participation of the person with aphasia. The SLP designs therapy activities that help the person with aphasia to engage in activities that are important to them. The PACE treatment method is a multimodal treatment that encourages any type of

communication including speaking, writing, drawing, gesturing and augmented and alternative communication (AAC) devices used to help the person with aphasia to get their message across.

Medical Model Treatments

Medical model based aphasia treatments include the following treatments mentioned by Msigwa & Cheng (2020) in a review of 160,753 articles published between 2016 and 2020 (n=92):

Speech-Language Therapy (SLT). Msigwa & Cheng's (2020) literature review concluded that contemporary rehabilitation guidelines for subacute and chronic aphasia recommend SLT as the "cornerstone of subacute and chronic PSA [post-stroke aphasia] management" (p.10); however, the high-intensity SLT therapies that are currently emerging lack sufficient clinical evidence for the optimal dosage (p.10). Additionally, there is evidence that emotional state and mood can influence the aphasia patient's motivation, cognitive performance and language processing (Wood et al., 2019) and "although [the patient's] emotional change is often acknowledged, many speech-language therapy rehabilitation plans fail to meet the emotional needs of people with aphasia and speech language pathologists must turn to other professions that are better equipped to manage them" (Wood et. al., 2019, p.2).

Non-Invasive Brain Stimulation (NIBS). Msigwa & Cheng (2020) found that "the most recent meta-analyses authenticated NIBS as an efficient therapy in promoting the [patient's] recovery when coupled with speech-language therapy (SLT) compared with monotherapy" (Msigwa & Cheng, 2020, p. 3). However, compared with "natural mechanisms, NIBS stimulation is... complicated..." (p. 3)...and "less cost-effective" (p.10). Repetitive transcranial magnetic stimulation (rTMS) "application above Broca's area was linked to enhanced language

outcomes” (Msigwa & Cheng, 2020, p.4); however, “clinical significance levels are ...[a] matter of future determination” (p.10). Studies on repetitive rTMS and transcranial direct current stimulation (tDCS) “have affirmed their beneficial effects on post-stroke aphasia recovery by inducing neuroplasticity of targeted brain areas” (Watila & Bakarabe, 2015, p.15).

Technology-based therapy. Recent trends suggest that SLT can be augmented effectively by technology-based and tele-speech therapies (augmented and alternative communication (AAC)) devices with relatively low operating costs compared with face-to-face SLT; and AACs provide “a compensatory approach to intensify [the patient’s] communication abilities” (Msigwa & Cheng, 2020). Alternative-augmentative communication devices such as the TalksBac system for adults with non-fluent aphasia have been found to be efficacious for adult patients with non-fluent aphasia and severe aphasia. Such devices allow individualized training to support therapeutic goals. “Small training steps permit individuals to move from one clinical task to another at different rates...so that communicative responsibility is increasingly assigned to the client” based on operant conditioning principles (Goldfarb, 2006, p. 61).

Pharmacotherapy. Modulation of the patient’s neurotransmitter pathways involved in speech and language is a potential pharmacological treatment. Recent neuroimaging studies have linked recovery from aphasia to neuronal reorganization (Msigwa & Cheng, 2020). As a result, several drugs are being studied; however, future clinical studies are needed to establish their safety, efficacy, optimal dosage and timing of administration.

Neurologic music therapy (NMT). Melodic intonation therapy (MIT) and modified MIT (MMIT) are procedures that apply the musical components of speech (rhythmic and melodic) to rebuild neurologic pathways needed for speech. Music interventions used in

neurologic music therapy (NMT) are based on neuroscience models of music perception and production and the “Rational-Scientific Mediating Model” (LaGasse & Thaut, 2012, p.160) which examines the influence of music on changes in non-musical activity. There are several standardized treatment techniques for language, cognitive and sensorimotor rehabilitation that are evidence-based protocols.

Melodic Intonation Therapy (MIT) has been shown to improve speech production in patients with non-fluent aphasia. Published qualitative research data and some quantitative randomized clinical trial data have demonstrated that patients suffering with Broca’s aphasia benefit by an increased ability to communicate following MIT. The different components of music such as pitch, tempo, timbre, harmony and rhythm are processed in different locations in the brain and are not restricted to only the right hemisphere (Baker, 2000). “By incorporating a musical element to the therapy, the left and right hemispheres of the brain form a “tandem relationship” and thereby re-establish neuronal pathways that enable the production of speech” (Baker, 2000, p. 110).

Modified melodic intonation therapy (MMIT) is a multi-step process that involves “composing melodic phrases that approximate the spoken sentence, ...[that] enables easier access to neural networks for both singing and language and is a key element in translating that phrase back to normalized speech” (Conklyn & Meehan, 2018, p.102). In a study reported by Conklyn & Meehan (2018), results using the Western Aphasia Battery (WAB) showed clinically significant improvement in speech and language production of patients suffering from aphasia who participated in MMIT. Random controlled trials (RCT)-based clinical data is still limited (Msigwa & Cheng, 2020) and further research is warranted.

Neurologic music therapy (NMT) methods are supported by neuroscience research. Neuroscience has provided insights into how music is processed in the brain and how music supports non-musical activity such as language and sensorimotor coordination. In an article authored by LaGasse and Thaut (2012), the authors state that “music processing is cortically distributed and shares non-musical cortical networks” (p. 154). The cortical areas of the brain that are involved in music processing “are also active in non-musical functions [such as speech]...[and] should damage occur to a specific cortical area, the distributed nature of music processing allows for the maintenance of musical skill post-injury, despite related loss of nonmusical skill” (p.154). “Music activates speech systems differently than non-musical stimuli” (LaGasse & Thaut, 2012, p.158). Music can drive brain plasticity, creating the establishment of new neural pathways to connect the centers of the brain involved in speech production. Diffusion tensor brain imaging has shown that “music can drive cortical plasticity for speech function, even when the patient is as much as one-year-post-neurological injury” (LaGasse & Thaut, 2012, p.158).

Clinical Incidence, Causes and Impact of Depression in Patients with Aphasia

Clinical Incidence

In an article on emotional responses to aphasia, Code and Herrmann (2003) report that most studies agree that it is very common for patients with aphasia to experience post-stroke depression (PSD). The incidence of PSD ranges from 5-11% to 50-60%; the difference being due to different sample selection and different ways of measuring depression in the studies. In a more recent study, the authors found that “around 60% of chronic vascular aphasia (CVA) cases documented co-occurring with depression” (Msigwa & Cheng, 2020, pp. 2-3). Another source

(Kauhanen et al, cited in Morrow-Odom & Barnes, 2019) stated that around 70% of patients with aphasia show signs and symptoms of depression three months post-stroke and 62% at one year.

Aphasia appears to be more detrimental to quality of life than other major health issues including cancer and Alzheimer's disease (Morrow-Odom & Barnes, 2019, p.16). A study done by Starkstein and Robinson reported that abnormal emotional states accompanying aphasia range from generalized anxiety disorders, depression, paranoid and psychotic states, to delirium characterized by loss of drive or motivation and denial, neglect and anosognosia (as cited in Code & Herrmann, 2003).

Causes of Depression in Aphasia

Code and Herrmann (2003) have determined the causes of depression in aphasia include many of the following and should be recognized as key intervention areas:

- the nature, severity and site of the brain damage affecting neuronal processes and neurobiochemical pathways underlying normal emotion; “people with middle cerebral artery infarction (causing damage to the major part of the frontal lobe and basal ganglia) appear to be especially vulnerable” (p.114);
- a reaction to psychosocial, neuropsychological and functional impairment and/or the patient's realization that their earlier hope for rapid restitution is unlikely to occur and that they may suffer from their disabilities for a long period of time;
- transition from in-patient to out-patient when the patient attempts to re-integrate into their pre-stroke social structure of family and community and the patient's role has changed from patient to disabled;

- the grieving process for the patient's loss of person or self: role, prestige, social position and identity which may also include a loss of possessions, job, income, hobbies or interest that can no longer be pursued with the loss of language. The grieving process entails stages of denial, anger, bargaining, depression and acceptance. "Depression is a necessary stage of emotional recovery ... [and] must be worked through successfully before acceptance can be achieved" (Code & Herrmann, 2003, p.117).

Importance of Treating Depression in Patients with Aphasia

Even though depression is often a co-morbidity in patients with aphasia, it often goes untreated. In their review of studies on depression and aphasia, Code and Herrmann (2003) concluded that "the dramatic and disabling effects of physical impairment accompanying stroke often take priority in treatment. "This emphasis reflects the dominance of the medical model in our health-care systems...[where] emotional experience, social roles and psychosocial perceptions are ...not easy to measure" (p. 122). "Consequently, issues of personal experience are often neglected in rehabilitation...too few rehabilitation programs entail significant assessment or make sufficient effort to incorporate emotional and psychosocial factors into reablement" (p.122). The result of lack of attention to the aphasia patient's emotional experience is that untreated emotions can often have a negative impact on the patient's speech rehabilitation or full recovery. As observed in Baker & Wigram's study (2004), "...mood disturbances impact negatively on patient treatment as patients become overwhelmed by the intensity of their emotions and unable to divert their attention to the tasks required in the therapy session" (p.55).

Communication through spoken language involves more than the production and understanding of speech. It serves to create and support social interactions and therefore social and emotional well-being (Wood et al., 2019). When someone with aphasia loses the ability to communicate, especially without warning, their emotional status becomes compromised. “As a result, individuals with aphasia can experience depression, anxiety, social isolation, occupational frustrations, loss of interest, and decreased involvement in daily living” (p.2). “Emotional state has a significant impact on motivation, physical performance and language processing” (Code & Herrman, 2003, p.122). Studies reviewed in the Code and Herrmann (2003) article found that “people with positive mood states respond better to therapy than those who are depressed” (p.122), “depressed aphasic individuals show a lower rate of recovery and significantly greater cognitive impairment” and “the success of rehabilitation may depend on early diagnosis and adequate therapy for depression” (p. 122-123).

A Cochrane library review (Magee et al., 2017) of 29 random-controlled trials (RCT) involving 775 adult participants with acquired brain injury found that mood disorders are considered to be one of the greatest barriers to reintegration back into the community, affecting motivation to engage in rehabilitation. Effective treatment of depression may bring substantial benefits by improving medical status, enhancing quality of life, and reducing pain and disability.

In a recent study by Tamplin et al. (2016) the authors postulated: “A positive self-concept after neurological injury is associated with enhanced quality of life and good mental health. Therefore, effective reconstruction of identity is heralded as an important goal of rehabilitation” (p.111). The authors further state that “one of the risks associated with acquiring a disability is that the disability narrative becomes the dominant narrative, the story through which

all life is experienced and framed” (p. 113). The authors cite studies by Anson & Ponsford, 2006 and Kelly, Ponsford & Couchman, 2013 that have shown that patients with neurologic injuries often experience a loss of sense of self accompanied by low self-esteem, depression and anxiety. Other studies by Carroll & Coetzer, 2011, Geyh et al., 2012 and Kelly et al., 2013, cited by Tamplin et al. (2016) showed that there is a confirmed association in the reduction of self-concept and negative changes in mood and non-productive coping. Tamplin et al. (2016) concludes that these studies support the theory that improvements in self-concept and mood can help a patient become more resilient and cope with the trauma of their illness and disability.

Methods for Treating Depression in Patients with Aphasia

Several means have been explored to incorporate emotional reactions and psychosocial adjustment into rehabilitation of patients with aphasia including pharmaceuticals, individual and group counseling and psychosocial adjustment interventions; however, they all have limitations.

Pharmaceuticals

Physicians have been reluctant to prescribe anti-depressants for patients with aphasia because of side effects and unclear effectiveness given the range of factors that can be involved in aphasic patients' depression.

Counseling

Individual and group counseling for aphasic patients and their relatives have been shown to be effective in some studies; however, these interventions are reliant on communication (Code & Herrmann, 2003). Family counseling has shown potential benefits for the families of aphasic patients; and psychosocial adjustment interventions offer support to reintegrate the patient into their former life. These interventions have the benefit of recognizing that aphasia affects others

in the patient's social network including the patient's family who experience considerable disruption in their professional, social and family life (Code & Herrmann, 2003). The success of these approaches, however, relies on participation of the people in the patient's social network which is not always possible or consistent.

Communication Partner Training

The importance of involvement of the aphasic patient's social network is underscored in a systematic review of 70 analytical studies done by Northcott et al. (cited in Msigwa & Cheng, 2020), wherein the authors found that an aphasic patient's social support network helped defeat post-stroke depression. Earlier research concluded that communicative partner training (CPT) "enhances and tackles the adverse psychosocial outcomes for PSA [post stroke aphasia] victims and communication partners" (Msigwa & Cheng, 2020, p. 9); and a survey of 122 speech language pathologists suggested when CPT is "available with widespread acceptance, it will set an imperative element of stroke rehabilitation" (p. 9). In addition to treating the impairment itself, psychosocial approaches are needed to support the patient's re-integration [into their prestroke life], social affiliations and life adjustments; "...the general aim of authentic rehabilitation should be to prepare and assist people [with aphasia] to integrate into a community and stresses the importance of social affiliation as a means of maintaining and developing self-identity" (Code & Herrmann, 2003, p.125).

Barriers for Use of Psychotherapy for Treating Depression in Patients with Aphasia

In a qualitative research study of speech-language pathologists (SLP) (Ryan, Bohan & Kneebone, 2019), study participant SLPs contended that "people with post-stroke aphasia are susceptible to a decline in mental health [and] are amenable to ...psychological support" (p.779);

however, there is a dearth of psychological/counseling professionals who are skilled in communicating with people with aphasia. In another research study of 1,771 mental health professionals, the researchers found that 52% had not provided services to patients with aphasia and 46.2% of research participants indicated they were not confident in providing ethical services to patients with aphasia (Morrow-Odom & Barnes, 2019).

In a research study of speech-language pathologists (SLPs) treating patients with aphasia in Australia, researchers found that few mental health practitioners work with people experiencing aphasia (Ryan et al., 2019) and investigated what barriers exist for mental health professionals in treating these patients. Key findings include:

- Knowledge and/or experience. 37.2% of SLPs reported that staff who can treat psychological health feel under-skilled to treat people with aphasia (Ryan et al., 2019).
- Resistance. 18.6% of staff who treat psychological health are resistant to treating people with aphasia (Ryan et al., 2019). Psychotherapy often relies on talk therapy and this is a challenge for patients with speech disorders as a result of aphasia. “If they don’t talk, how can I do psychotherapy with them?” (p. 785).
- Lack of evidence for treatment of mood disorders post-stroke. Depression screening tools for people with aphasia are available, however, such as the Stroke Aphasia Depression Questionnaire, Sutcliffe and Lincoln 1998, and have been recommended for use in clinical practice (Ryan et al., 2019).
- Lack of clarity in scope of practice for SLPs (Ryan et al., 2019).
- “Semi-formal or informal sources of help may be preferred [over psychotherapy] by people with aphasia” (Ryan et al., 2019, p. 790).

Notwithstanding the above-mentioned challenges, this study also found that SLPs perceived the absence of treatment of an aphasic patient's psychological health to be "directly impacting on outcomes achieved from the provision of traditional language therapy" (Ryan et al., 2019, p. 790) and was therefore a source of "negative emotions (sadness, frustration, a sense of diminished utility) expressed by SLPs" (p. 790) who are treating this population.

Music Therapy Methods for Treating Depression in Patients with Aphasia

Music has been observed to effectively improve mood and reduce causes of depression. Dr. Oliver Sacks, M.D. a prominent neurologist, professor and author of published works about neurological disorders, addresses this finding in his book, *Musicophilia* where he observes:

We are a linguistic species – we turn to language to express whatever we are thinking, and it is usually there for us instantly. But for those with aphasia, the inability to communicate verbally may be almost unbearably frustrating and isolating... (Sacks, 2007, p. 215).

He goes on further to state:

When such patients sing, "suddenly their disability, their cut-offness, seems much less...[and] says "I am alive, I am here....[enabling them to] express thoughts and feelings that cannot be expressed by speech. Being able to sing words can be a great reassurance to such patients, showing them that their language capacities are not irretrievably lost, that the words are still "in" them somewhere even though it may take music to bring them out" (Sacks, 2007, pp. 215-216).

Additionally, singing with others, according to Sacks' observations of patients he has treated can create a sense of community and "patients who seemed incorrigibly isolated by their disease...are able, at least for a while, to...bond with others" (Sacks, 2007, p.145).

A Cochrane library review of treatments for acquired brain injury (Magee et al., 2017) stated that "during music participation the brain releases neurochemicals that increase feelings of pleasure and alertness, and decrease anxiety and stress" (p.7). "Used in a group setting, music participation can provide opportunities for peer support and building social skills to facilitate increased independence" (p.7). Additionally, in its meta-analysis of 29 random-controlled trials (Magee et al., 2017), the authors concluded that music may improve mood states based on the Profile of Mood States from three studies; however, they were unable to confirm which types of music intervention methods were most beneficial.

In another recent Cochrane library review of music therapy and depression (Aalbers et al., 2017), the authors summarized nine randomized or controlled clinical trial (RCT or CCT) studies involving a total of 421 participants ranging from adolescents to older people, 411 of which were included in the meta-analysis examining the effects of music therapy for depression compared with treatment as usual (TAU) and psychological, pharmacologic and/or other therapies. TAU was defined as "psychotherapy in combination with medication, collaborative care, occupational therapy" (p.25). The meta-analysis found statistically relevant evidence that music therapy added to TAU provides short-term beneficial effects for people diagnosed with depression compared to TAU alone (p.2). "Concerning primary outcomes, we found moderate quality evidence of large effects favouring music therapy and TAU over TAU alone for both clinician-rated depressive symptoms" (p.2).

The authors conclude that “evidence suggests that music therapy, when added to treatment as usual, can help people affected by depressive disorders ... by improving symptoms related to depression” (Aalbers et al., 2017, p.26); and that because depression incurs high costs in healthcare, treating depression and improving a patient’s psychological functioning can reduce healthcare costs (Aalbers et al., 2017). The authors note that music therapy must involve a board-certified music therapist because of the need to adapt musical material to individual patient needs and because music can elicit emotions and discussion of personal topics that require specialized music therapy training and competencies to manage (Aalbers et al., 2017).

Due to the study design, the results were inconclusive as to whether music therapy alone produced more favorable outcomes than psychological therapy alone. The meta-analysis also did not conclude whether there were any differences in the methods of music therapy used. Future trials are warranted to enlarge the sample size, isolate the contribution of music therapy alone, determine whether one music therapy method (e.g. active versus receptive) is better than another and identify the mechanisms of action of music therapy for depression (Aalbers et al., 2017).

Music Therapy Methods: Song-writing to Restore Self-identity and Social Connection

In a quantitative study of patients with acquired brain injury and/or spinal cord injury, researchers sought to determine whether the therapeutic process of songwriting could be an effective medium of change to integrate patient’s past healthy self with the present injured self to help restore their self-concept (Tamplin et al., 2016). The study’s song-writing protocol focused on changes in self-concept due to disruptions caused by the brain or spinal injury and engaged the participants in a process of self-reflection. The music therapist’s role was to listen and work

with the songwriter to reconstruct the patients' stories to make meaning of them by asking questions, giving feedback and encouraging exploration of alternative possibilities and meanings. This therapy is based on the theory that one's self-concept is shaped by their life stories and that by telling and re-telling the stories through song-writing, the client can find meaning about the past, gather insights about the present and develop direction for the future, thereby re-integrating themselves. Through songwriting, the client can tell the history of their lives, reconstruct a particular life event, express their feelings about the situation and construct possible futures.

The protocol included the following steps: participants choose their musical preferences, sometimes used pre-recorded music for ideas for the songwriting, participated in determining whether to start with lyrics or musical styles, brainstormed ideas, composed lyrics using the participant's narrative, then composed live music or used digital media that reflects the lyrical content, made final adjustments and recorded the piece. The process involved 12 songwriting interventions over a period of six weeks. The first four sessions focused on the past, the middle four on the present and the final four on the future and how the person conceives themselves to be in the future.

Results showed quantitative changes in the content focus of the songs written to reflect their past, present and future self-concept as follows. Pre-injury, the largest percent of content focused on family roles (36%) and personal content defined as personality, sense of adequacy and self-definition (36%). In the present, the largest percentage of song content focused on physical limitations (40%) and loss of vocational identity (20%). The future content largely focused on identity based on renewed or altered family roles (30%) and social relationships (20%) with significantly less emphasis on physical issues and limitations (25%).

Tamplin et al. (2016) conclude from this study that the following are reasons why songwriting is particularly effective:

- There is strong neurological evidence that suggests music has strong links to memory, emotions and event recall and therefore is helpful in aiding patients, especially those with brain injury, to retrieve memory.
- “Studies indicate that music holds greater meaning, emotion and mnemonic potential than speaking alone because emotionally powerful events are encoded strongly into memory” (Tamplin et al., 2016, pp. 115-116).
- “There is also neurobiological evidence that the medial prefrontal cortex is a key region linking music, memory and emotion... [which] suggests that ... there is a chance that the specific music heard at the time would later trigger strong autobiographical memories...[that] are important in raising awareness of the residual [past, healthy] self, ...enabling a healthier, more integrated self-concept to emerge” (Tamplin et al., 2016, p. 116).
- Music activates the pleasure neural network of the brain and may therefore help alleviate symptoms of depression and anxiety and lead to improved methods of coping. “A more positive attitude may lead to greater motivation to face self-concept crises so that they can be processed and revised” (Tamplin et al., 2016, p.117).
- Song-writing can lead to experiences of flow and meaningfulness (Tamplin et al., 2016). “As flow and meaning are predictors of well-being and coping, songwriting has the potential to directly impact people’s capacity to use coping

strategies when facing crises....[and]... provides an alternative outlet for people who may find it difficult to verbally express how they are feeling” (p.117).

- Songwriting is a form of narrative therapy – a medium whereby people can explore their life stories and “make sense of their past, present and future ...to construct a healthy identity” (Tamplin et al., 2016, p.117).

Music Therapy Methods: Receptive Music Listening for Stroke Patients

Music is “a powerful stimulus that evokes and modulates moods and emotions” (Aalbers et al., 2017, p.9). In receptive music therapy, the mechanism of action is that music directly induces changes in consciousness, induces moods and evokes feelings that can help reduce stress and energize the body (Bruscia, K. as cited in Aalbers et al., 2017). In a quantitative research study, Sarkamo et al. (2008) found that a protocol using a stroke patient’s self-selected music listening reduced depression or confused mood states in stroke patients by a statistically relevant amount as compared with listening to audio books or a control protocol with no listening (as cited in Heiderscheit & Madson, 2015). “Listening to music is a complex process for the brain, since it triggers a sequel of cognitive and emotional components with distinct neural substrates” (Sarkamo et al., 2008, p.867). “Neuroimaging studies demonstrate that music-evoked emotions engage the core structures of emotional processing, leading researchers to view music-evoked emotions as having biological similarity to everyday emotions” (Heiderscheit & Madson, 2015, p.45).

Receptive music listening methods used by music therapists often use the iso principle. which was introduced in the late 1940s as a way to manage mood. Using the iso principle, the music that is selected for listening must match the mood of the client at the outset and then

gradually change to match the intended mood. In this way the selected music “contrasts the mood of the client and ...gradually (re)attunes the client’s mood” (Heiderscheit & Madson, 2015, p. 46).

In a case study using the iso principle for mood management of a patient suffering depression, the findings showed that the patient’s listening to a range of music enabled the patient to manage and improve her mood over time from feelings of hopelessness and low energy to feelings of optimism and energy (Heiderscheit & Madson, 2015). One of the benefits is that this protocol is a non-pharmacological intervention and can be patient-controlled thereby allowing the patient to feel a sense of empowerment in managing their health. Additional clinical case studies and research are needed to further explore and document the use and impact of receptive music therapy using the iso principle for patients suffering from depression.

Music Therapy Methods: Song Discussion

Gardstrom and Hiller (2010) argue that song discussion is an effective method of psychotherapy. In this method, the client and therapist listen together to a song pre-selected by the therapist and then discuss the meaning and relevance of the song and lyrics to the client. “In music psychotherapy, the music itself serves as a catalyst for the surfacing of cognitions and emotions of the client...” (Gardstrom & Hiller, 2010, p.148). This can result in “improved self-awareness, release of emotions, development of healthy interpersonal relationships, healing of emotional trauma, and discovery of greater meaning and fulfillment in life” (p. 148).

The authors observe that there are several complex decisions that need to be made by the music therapist in order to achieve clinical success (Gardstrom & Hiller, 2010). However, the published literature offers little guidance regarding these decisions. Consideration must be given

to the theme and main messages conveyed by the lyrics, the point of view being expressed by the songwriter versus the listener's perspectives, the variability, tension and harmonic congruence of the music, the familiarity of the song and song preferences of the client, the cognitive abilities of the client to process the song material and possible transference and countertransference provoked by the song.

The authors suggest that song discussion is effective as psychotherapy because the client's interactions and reactions to the lyrics and musical elements of the song activate the client's inner psychological processes revealing painful "secrets," emotions that lie below consciousness, emotional turmoil, relationship issues and denial. Therefore, in addition to a knowledge of music, the music therapist utilizing such a method must have a solid understanding of psychology and conscious and unconscious psychological processes in order to interpret and effectively address what occurs for a client during a song discussion (Gardstrom & Hiller, 2010).

Collaborative Therapy

Multiple providers may need to be involved in order to treat not only the neurological rehabilitation of speech through protocols such as neurologic music therapy (NMT) but also the emotional state of the patient with aphasia. According to a study by Hoover et al. (2017) cited in Wood et al., (2019), "best practice in aphasia treatment involves interprofessional collaboration" (p. 2). Treatment teams may include a speech-language pathologist (SLP), a physical therapist (PT) and an occupational therapist (OT) among others.

Collaborative Models

In an article written by Mary Hobson, MT-BC (2006), she describes three models of collaborative strategies that can help drive more holistic care of the patient:

- **Multidisciplinary.** Individual professionals approach the client's needs from their own area of expertise, develop and implement their own treatment goals and interventions.
- **Interdisciplinary.** The treatment team agrees on treatment goals for the patient; professionals use their own professional approaches to achieve the goals and share information.
- **Transdisciplinary.** In this collaborative model, the various professions work together on the same goals at the same time.

The benefits of collaborative treatment models are improved continuity of care for the patient and a broader set of treatment options. Difficulties that must be overcome include territorialism that can undermine collaboration, cross-disciplinary communication and misunderstandings due to different professional vocabularies, staying within ethical guidelines regarding competency, and reimbursement policies that encourage territorialism and justification of individual professional contributions to patient outcomes (Hobson, 2006). Treatment collaboration requires that all professionals act in conformance with the ethics standards in their respective professions and scope of practice as prescribed in AMTA's Code of Ethics (2019) sections 1.12, 1.13. (Hobson, 2006).

Examples of Collaborative Methods: Case Study of Veterans with Traumatic Brain Injury

In a study of veterans diagnosed with traumatic brain injury (TBI), the researchers sought to examine the effectiveness of a treatment approach combining neurologic music therapy (NMT) and group psychotherapy to improve the mental functioning and psychosocial health of the study participants. The researchers claimed that "this study provides the first known evidence of the effectiveness of a cognitive rehabilitation program featuring a combination of

NMT and group psychotherapy” (Gardiner & Horwitz, 2015, p.198). The goals of the study were to support participants to (a) increase their understanding and acceptance of their condition; (b) develop a sense of hope and empowerment; (c) improve cognitive skills; (d) increase emotional stability; (e) improve social skills; (f) increase their ability to pursue meaningful vocational and avocational interests; (g) develop a stronger support system; (h) gain insight into the purpose of their lives (Gardiner & Horwitz, 2015).

Study participants were predominantly male (95.45%) and White (95.45%) with an average age of 54.95 and educational level of 13.36 years (Gardiner & Horwitz, 2015). The study protocol required that two groups meet at different times each week and follow the same procedures. An average of 54 weekly neurologic music therapy (NMT) and group psychotherapy sessions were held in total. Each group session was two hours: one hour of NMT and one hour of group psychotherapy. The following NMT protocols were used: musical attention control training (MACT), musical mnemonics training (MMT), musical executive function training (MEFT) and music psychotherapy and counseling (MPC) led by a board-certified music therapist who was also a licensed psychologist and board-certified neuropsychologist trained in NMT.

The group psychotherapy sessions were conducted by a licensed psychologist with training in group psychotherapy. The group sessions used a psychoeducational approach discussing and reinforcing the lessons from the NMT exercises. A broad selection of themes was discussed including anger management, the neurology of the brain, dealing with depression and stress, setting realistic goals, increasing motivation, developing and maintaining relationships and maintaining a support system. Family members were encouraged to join the group

psychotherapy sessions to learn about their family member's strengths and challenges and the skills taught in the NMT and group psychotherapy sessions that could be reinforced at home.

The study used a pre-test post-test design to evaluate results. The average time between the two tests was 31.14 months (S.D.=19.37) (Gardiner & Horwitz, 2015). The following tests were used to score results: the Digit span test, the Trail-making test, Word Lists II, Visual reproduction II, Logical memory II and mazes from WISC-III. All participants improved significantly on measures of visual attention, verbal learning, complex verbal memory, complex visual memory, planning and mental flexibility (p.197).

Participants rated both group psychotherapy (74.31) and neurologic music therapy (NMT) (70.74) on a 100-point scale. Participants were asked what they valued the most and any suggestions for improvements. Participants responded that they liked the group sessions because they were engaged with others who were experiencing similar impairments and experiences. Regarding improvements, participants mentioned they would like to increase the amount of music and include more group discussion. The authors concluded that "NMT and group psychotherapy were both considered valuable by the participants and that future interventions can be strengthened by using the two in combination" (Gardiner & Horwitz, 2015, p.198). Study limitations were the quasi-experimental design, lack of randomization and a control group and that the study was designed and evaluated by the same clinician which could introduce bias. This potential bias was controlled by the use of standardized neuropsychological measures and the tests were administered, scored and recorded according to the objective standard protocols established prior to this study. The authors suggest that future research is warranted that will

separate participants into three groups: neurologic music therapy (NMT) alone, group psychotherapy alone, and a group receiving combination therapy.

Examples of Collaborative Methods: Case Study of Use of Music Therapy for Neurorehabilitation of Aphasic Patients

In an evaluation of music therapy in German neurorehabilitation centers, Jochims (2004) explored whether treatment covering only one aspect of co-occurring damage might fail to meet the patient's overall rehabilitation needs. Jochims (2004) observed that due to the diversity of neurological diseases, treatment differs in several aspects. Patients with "progressive disorders such as Parkinson's disease, multiple sclerosis, Huntington's disease or motor neurone disease have to deal with the dying process in palliative care homes" (Jochims, 2004, p.161). "Patients after stroke [including aphasia], road accident, hypoxia, aneurysma bleeding, etc., after discharge from intensive care ...embark on a new life with a chronic handicap,...[need to] adjust to the disease...[and] come to terms with the limitations of their life" (pp. 161-162).

Jochims' research study (2004) found that there are six aspects of a chronic patient's life that must be attended to in order for the patient to fully recover and be able to live with their disability: physical/motor, sensory perception, cognition, communication, social competence and emotion/coping. In the study, it was observed that music therapists tend to concentrate on only a subset of these six factors, typically focusing on either the physical/functional or psychoemotional. To support this observation, Jochims gives the following examples:

- Neurologic music therapy (NMT): "...based on a neuroscience model of music perception and production and the influence of music on functional changes in nonmusical brain and behavior functions" (p. 163) with treatment techniques that are

based on scientific research, are standardized and “directed towards functional therapeutic goals” (p.163).

- Nordoff-Robbins: ...focuses on “communication with the objectives of contact and (musical) relationship,”... “ offering alternative forms of expression as well as stimulation of communication skills by improvising or singing with the patient” (p.164).
- Tomaino: based on the concept that “there is a strong connection between the auditory system and the limbic system...which makes it possible for sound to be processed almost immediately by the areas of the brain that are associated with long-term memory and emotions” [and] ...“concentrates on cognitive stimulation, aspects of attention, and powers of recollection, as well as the connection to the “self”” (p.163).
- Berger: “concentrates on sensory problems, while mood and emotional problems are considered mere side effects” (p.163). This approach is based on the concept that “when the system is not properly interpreting information from the environment, it cannot adapt satisfactorily. Adequate sensory information processing is important for functional adaptation” (p.163). Jochims (2004) suggests that music therapy is increasingly being found to be effective in addressing both the physical symptoms and the associated psycho-social and emotional issues.... The key is for a therapist continually to integrate the psycho-emotional with the physiological aspects of the problem, in order to evolve a truly holistic therapy intervention (p.165).

Based on the research, Jochims (2004) proposes that music therapy is a fantastic medium for all six potentially damaged aspects of human life. The deciding factor for the therapist is to perceive the complex actual needs of the patient with all his dysfunctions

and incorporate them into the treatment (p.165).

Jochims (2004) concludes that “the emotionally stable relationship between patient and therapist is the link connecting achievement-oriented exercise treatment aiming for improvement of functional deficits and psychotherapeutic empathy” (Jochims, 2004, p.168). The emotional state of the patient and the stage of the patient’s disease should dictate how to bridge these two views to work together with the patient. Jochims’ research also concluded that “if functional training is to be combined with emotional and communicative/relational approaches, ethical and relational questions have to be discussed” (Jochims, 2004, p.161).

Jochims concludes that there is significant potential to use music therapy more broadly: “the worldwide differing concepts of music therapy within neurology/neurorehabilitation show the possibility of pursuing different goals without changing the medium of intervention...[and] connect medical with psychological treatment” (Jochims, 2004, p.169).

Arguments Against Use of Music Therapy for Both Language Rehabilitation and Depression

Although music has unique properties that enable it to be used for both treating language rehabilitation following stroke and also the patient’s emotional well-being, there are challenges in being able to do so. Board-certified music therapists must also have training in mental health and be licensed in mental health counseling. In this case, it is conceivable that one therapist with both sets of training and licensing/certification could provide both forms of treatment using music. However, there are reasons that this may not be ideal.

Reimbursement Issues

In her study of the use of music therapy in German neurorehabilitation centers, Jochims (2004) found that there are barriers to providing holistic care including the health insurance system that is “willing to pay, only if there is evidence of progress in daily life...defined as physical progress” (Jochims, 2004, p.165). In the US, the equivalent of this thinking is evidence based practice as required for payment by many insurance companies. Reimbursement policies and the “medical model...focusing on functional outcomes...[may result in the clinician being] tempted to abandon treatment goals related to psychosocial development” (Hobson, 2006, p. 69).

Professional Training and Theory

Medical professionals and behavioral psychotherapists view human beings through a “mechanistic” (Jochims, 2004, p.167) lens and therapy is achievement-oriented toward therapeutic goals that are physically achievable and observable. Humanistic and psychoanalysis approaches, on the other hand, view the patient as someone needing affection, empathy and the feeling of approval with therapeutic approaches that attempt to accept the patient as they are and where evidence of change may be more elusive (Jochims, 2004). These difference in seeing the patient as being functionally “deficit orientated” (Jochims, 2004, p.165) versus “resource oriented” (p.165) is a hurdle that “would mean that music therapists must be able to switch between experience-oriented therapy suitable to certain phases or functions and exercise centered therapy suitable in other phases” (p. 166).

Professional Ethics

Ken Bruscia (2014) argues that “ an insidious danger for therapists is the fallacy of holism – that the therapist is addressing most of the client’s needs or that therapy will benefit the

client's whole being" (p. 284). He contends that a music therapy session should not presume to be able meet the physical and psychological needs of a client, even if there is a separate activity for each and that setting this expectation for a client risks being unethical. Bruscia further argues that attempting to be holistic "scatters and fragments the focus and efforts of both client and therapist and thereby risks the effectiveness of therapy" (Bruscia, 2014, p. 284). By trying to achieve too many goals, the risk is that none of them will be accomplished. Bruscia suggests it is important for the therapist to distinguish between direct and indirect benefits of therapy and to "limit the goals of therapy to only direct benefits" (p. 285).

Discussion

My observation that treatment needs to be broadened in order to fully rehabilitate the whole person is articulated well by the founder of my internship site, Martha's Vineyard Community Services, Milton Mazer, M.D. (1976) who stated the following:

Those in the helping professions set out to treat human beings in distress, yet often find themselves seeing a series of problems or predicaments and missing the person. Part of this difficulty arises from the need to analyze complex issues into smaller, more manageable components. The difficulty, too, is that human needs cover a wide spectrum, while professional skills are compartmentalized...[and] professional specialization can produce impermeable boundaries (Mazer, 1976, p. 203).

The Code and Herrmann article (2003) and several others cited in this review of the literature state that if mental health and behavioral issues of a patient with aphasia go untreated, the patient's motivation to engage in language rehabilitation may be negatively impacted and the patient will not be fully rehabilitated because (a) mental health can determine the rate of speech

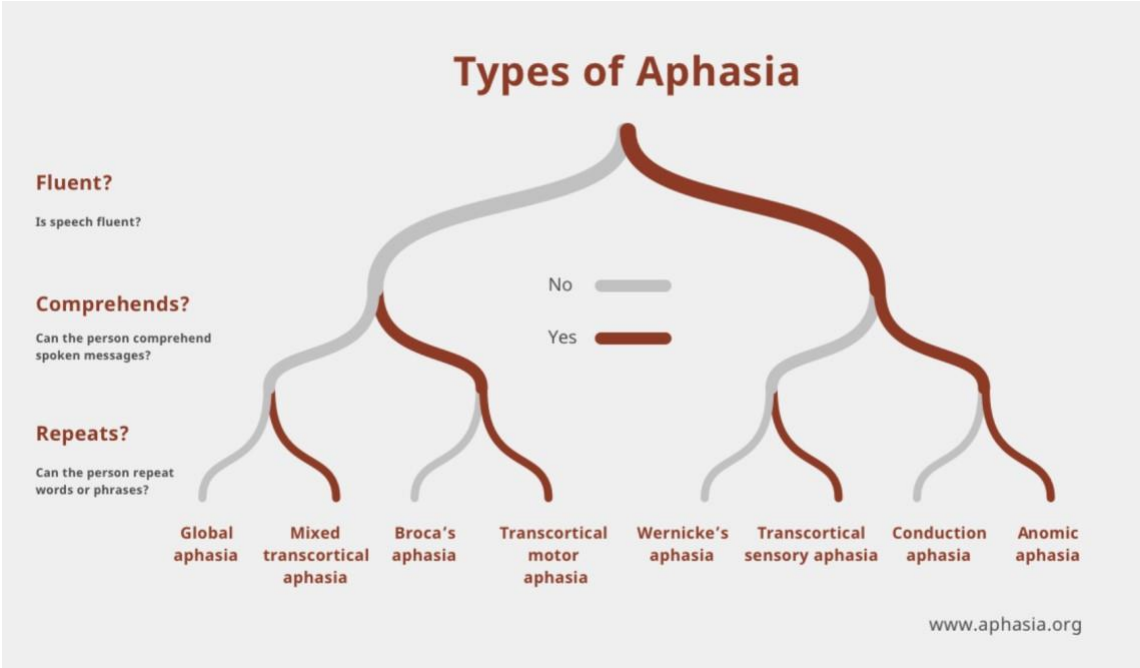
language rehabilitation and be a rate limiter and (b) after neurological rehabilitation of brain language centers if the patient continues to suffer from a mental health disorder like depression, anxiety or relationship issues, they will not be able to return to being completely functional.

A review of the literature suggests that music therapy is a medium that can treat language rehabilitation as well as depression in patients with aphasia; however ethical standards and scope of practice must be adhered to and the music therapist must also have adequate training in mental health counseling. Additionally, for this to become an accepted practice, there must be quantitative evidence. Future studies are needed that use quantitative metrics to provide evidence-based treatment results. To determine the efficacy and effectiveness of combined protocols using music therapy for both language rehabilitation and depression, random controlled trial studies are needed that would quantitatively measure separate groups of music therapy for language only, music therapy for depression only, psychotherapy only for depression and combination therapy. A further comparison needs to be made of the efficacy of music therapy versus speech-language therapy alone and in combination with psychotherapy for patients with aphasia. Ethical considerations must be adhered to as well as scope of practice.

In summary, this paper has attempted to investigate the importance of treating the mental health, specifically depression, of a patient undergoing language rehabilitation treatment for aphasia and the potential of music therapy for treating both language rehabilitation and depression in patients with aphasia. “Currently, with a more holistic way of defining health, music therapy addresses both the specific needs of the person and their inner resources for maintaining and enhancing wellbeing” (Hanser, 2020, p.4). Music therapists can play a formative role in promoting a better understanding of the role of mental health in successful language

rehabilitation, demonstrating the potential impact of music therapy on the patient's mental health and language rehabilitation, engaging in clinical research to investigate the benefits and efficacy of music therapy for depression and language rehabilitation and suggesting possible extensions of music therapy practice to be inclusive of the aphasic patient's mental health as well as language rehabilitation.

Appendix A



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THESIS APPROVAL FORM

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Thesis Advisor: Dr. Vivien Marcow Speiser _____