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Movement as Medicine:
Dance/Movement Therapy for Individuals with Autism, Parkinson's Disease, and Cancer

A Thesis Presented

by

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To the Keck Science Department

of

Claremont McKenna, Scripps, and Pitzer Colleges

In Partial Fulfillment of

The Degree of Bachelor of Arts

Senior Thesis in Biology

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Abstract

Dance/movement therapy (D/MT) is the psychotherapeutic use of expressive, creative movement to support holistic well-being. D/MT views the human being as a single body-mind unit and movement as a manifestation of life experiences. While typically practiced as a mental health intervention, D/MT can be adapted for a variety of populations. This thesis evaluates scientific data for the non-traditional use of D/MT for three conditions: autism, Parkinson's disease, and cancer. For individuals on the autism spectrum, D/MT can strengthen attunement skills, provide creative communication outlets, and relieve harmful physical manifestations of autism. For individuals with Parkinson's disease, D/MT can simultaneously ease cognitive and physical symptoms while slowing disease progression. For cancer patients, D/MT serves as an adjunct, palliative therapy accessible before, during, and after treatments to help with psychological and physical pain management. D/MT does not cure these conditions; rather, it is a complementary intervention that promotes healing, increases quality of life, aids in expression, and restores bodily safety. Limitations include a lack of robust scientific literature on the subject, a lack of diverse D/MT practitioners and practices, and limited availability of services. Through the D/MT framework of movement as medicine, we can view life itself as a dance.

Introduction

Movement as Life

The mind and the body are in many ways inseparable. Emotions are often felt physically, and physical sensations in turn affect our thoughts and emotions. We sense and interpret the world through our bodies, and we communicate our thoughts through the body, either through expressions, movement, language, touch, etc. On a biological level, the brain is a bodily organ; on a philosophical level, many believe that the body is assigned meaning through the brain. In these ways, the mind and body can be considered inseparable, despite Western medical science's insistence on treating them as discrete systems. The concepts of the mind-body unit and movement as its manifestation are at the core of dance/movement therapy (D/MT).

D/MT is the practice of using expressive, creative movement for psychotherapeutic understanding and change. The practice uses dance and movement to express the subconscious, promote holistic well-being, and support physical and mental healing. These processes are safely facilitated through the patient-therapist relationship and integrated into a holistic, individualized treatment plan. Given the adaptability of the practice, D/MT can work for a variety of populations. Potential settings include psychiatric facilities, private psychological practices, schools, prisons, professional dance spaces, groups for the elderly, and physical rehabilitation centers.

Somatic therapies such as D/MT position movement as the foundation of life. The field of somatics refers to any physical practice focused on proprioception such as dance or yoga. Somatics proposes that movement and sensation are the original language and thus a core method for understanding ourselves. On a biological level, movement is necessary for human life, and we begin moving before we are even born. Although we are not always consciously

aware of it, the body constantly moves through breathing, heart rhythms, metabolism, eye tracking, etc. Somatic educator Staci Haines explains the importance of the physical realm to our experience of life in *The Politics of Trauma: Somatics, Healing, And Social Justice*. Haines writes: “Sensations are the building blocks of our experiences – meaning, at the base of every internal experience is sensation. Understanding sensations as a foundational language, we can then feel emotions. For example, I may feel sad, and I can feel the sensations of pressure in my chest, warmth in my throat, and wetness in my eyes. I then experience all this as sadness.” D/MT is based on this somatic framework of movement, and physical sensation as the basis of life.

The “dancing” in D/MT is different from the hyper-stylized, formalized movement typically associated with dance. Many forms of dance such as ballet or modern dance perpetuate the body as an object to be trained toward a performance standard. D/MT is instead focused on creative, individual-led, improvised, internal movements. Anna Halprin, modern dancer and pioneer in the field, explains this new approach to dance:

Dance is not necessarily graceful, pretty, or spectacular. Dance can be grotesque, ugly, clumsy, funny, frightening, and conflicted. It can stomp, fall, attack, clutch, and reach. It can open, close, tip-toe, crawl, twist, turn, pound, jump, run, or skip. We can move together, or alone. We can move backwards, sideways, up and down. Movement is happening everywhere all the time. It is the motion of our cells, the pulse of our blood, the rhythm of our breath. [...] Any body, no matter how old or young, in whatever physical condition, has a capacity to move, even if it is just your little finger or a movement carried as an image in your mind's eye. (Halprin, 2000, p. 23).

Unlike most modern dance, therapeutic movement is not for public consumption, nor does it “demand any formal or technical capacity for the person to be able to benefit” (Chaiklin & Wengrower, 2015). D/MT challenges the framework of what we may typically think of as dance to include breathing, stillness, gestures, and improvisation. D/MT challenges ableism by recentering dance as accessible to everyone, regardless of movement ability, body, gender, age, etc. In the D/MT framework, life itself is a dance.

D/MT also shares similar goals as traditional psychotherapy but differs in methods. Psychotherapy involves creating a safe environment and a supportive patient-therapist relationship. Psychotherapy helps patients understand their emotions, process life experiences, manage and improve mental health conditions, and work through any other challenges or goals that may arise. Most psychotherapeutic modalities rely on speaking; rarely does the body become involved in treatment. Just as the purely physical approach of traditional exercise and dance programs ignores the cognitive realm of life, conventional talk therapy modalities limit the patient’s experience to their words. Instead, D/MT uniquely addresses the patient as a whole person.

History of Dance/Movement Therapy

Beginning in the 1950s, the pioneers of D/MT began developing the dance/movement therapy practice. This cohort of modern dancers, including Marian Chace, Mary Whitehouse, and Trudi Schoop, were largely inspired by the principles of the modern dance movement developing at the time. This new style of dance “focused attention on the symbolic potential of the human body in motion, free of the stylization that characterized classical ballet” (Cruz, 2001). The idea that dance could be symbolic and expressive carries into the philosophy of dance/movement

therapy. In 1966, D/MT was formally established as a profession with the creation of the American Dance Therapy Association. Today, dance/movement therapists practice with a DMT license after completing a master's degree in D/MT or completing equivalent D/MT training along with a counseling degree. The field has gained recognition in recent years as increasing scientific research legitimizes the practice. D/MT is currently included in the field of creative arts therapies, among music, art, writing, and drama therapy.

It's important to acknowledge that dance as a healing art is not new, nor is it a Western invention. Many marginalized cultures in the U.S. have been healing through community movement long before mainstream science validated its efficacy. While D/MT has only formally existed for a century, humans have been dancing for as long as we can trace our histories. Archaeological records depict dance from over 10,000 years ago through artifacts such as artwork in India, recordkeeping in Egypt, and pottery in China. Early uses of dance include history keeping and storytelling, religious ceremonies, healing rituals, entertainment, and other daily rituals. Even today, many of us intuitively turn to dance and movement for similar purposes: cultural connection, fostering community, spiritual and/or religious practice, joy, communication, stress relief, and emotional release (**Figure 1**).

The mind-body disconnect that D/MT seeks to address tends to be especially exacerbated in North America & Europe. The mind-body disconnect philosophically materialized in the western world with “the emergence of Christian religious belief during the Middle Ages and the later rational philosophy of Descartes in the seventeenth century” (Chaiklin & Wengrower, 2015). This new branch of thought “tended to see the body as impure or of secondary importance” and “discounted the relationship of mind to the body, [seeing] them as distinct substances with the mind being the real self” (Chaiklin & Wengrower, 2015). Many cultural

dance styles and practices were banned in Asian & African countries during European colonization. Western medicine is in-line with this mind-body separation, both historically and in many present-day systems. Most medical practices treat various systems of the body as discrete. Doctor's visits rarely address psychological well-being, and common psychiatric and therapeutic interventions tend to rely on medication and/or talk therapy. Indeed, it is rare to see holistic mind-body interventions in mainstream American medical settings. D/MT presents a unique, integrated approach to healing, bringing out the healing qualities from innately human tendencies (Figure 1).



Figure 1. The urge to move is multifaceted and innate, as explored in *(Re)Connecting: Healing the mind/body through dance* (Zanobini, 2022). We naturally gravitate toward movement for a variety of reasons: for example, dancing in an LGBT+ club during Pride builds community and sparks joy (left); marching in a protest advocates for human rights and creates solidarity (center); improvisational movement relieves stress and allows for creative expression of feelings (right).

Movement as Medicine

Over the summer of 2022, I documented the power of D/MT for healing the mind-body disconnect, specifically as a mental-health modality, in a short film titled *(Re)Connecting: Healing the mind/body through dance* (Zanobini, 2022). Part of my research included interviews with dance/movement therapists and experiencing D/MT first-hand. Evidence supporting

somatic practices for mental health issues such as trauma, depression, anxiety, and disassociation is considerably strong and growing rapidly. My film and related research for the project serve to augment this evidence through a personal account of using D/MT to heal. Typical D/MT exercises I experienced included themed movement improvisations and verbal group processing facilitated by a therapist. Movement prompts included expressing emotional states of the day, analyzing habitual movement patterns, and embodying versions of our past selves. These exercises helped restore my connection to my body, refined my attunement to myself and the world around me, regulated my mind and body down to a calm state, and gave me a creative, non-verbal outlet to express my subconscious (**Figure 2**).

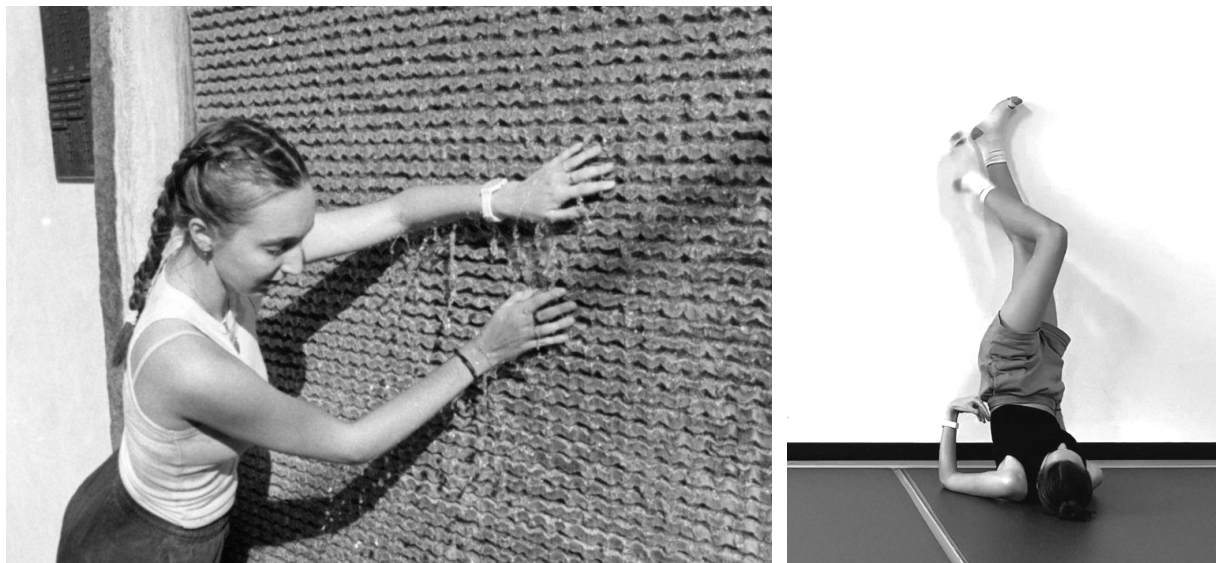


Figure 2. The framework of D/MT uses movement and sensation to better understand and express ourselves. It redefines dance to include breathing, gestures, imagination, and improvisation.

One typical D/MT session activity is Authentic Movement, an improvised movement exercise with a mover and witnesser. As described below (and in *(Re)Connecting*), I began one D/MT class this summer feeling unsettled, anxious, and overwhelmed with the noise of the city.

Through the D/MT exercise of Authentic Movement, I therapeutically processed these feelings and began to feel safer in my body. Below is a transcript of my notes from the session

(Appendix).

DANCE/MOVEMENT THERAPY CLASS @ GIBNEY - SAT. JUNE 18 [2022]

Today we are doing Authentic Movement where one person moves according to any & all movement impulses with eyes closed while their partner witnesses them from the sides of the room. As the mover - my first role:

I move almost entirely connected to the wall and floor. My body melts into itself with the corners of the room holding me. [...] I feel super grounded (literally!) to the room and to my body. I open my eyes and my partner is there witnessing me, holding space for me. I am never by myself - I am supported in lots of ways during this exercise (the wall, the floor, my witnesser, the teacher [therapist], etc.).

[...] This time I am moving again, more grounded, so I immediately hear the traffic sounds outside. These are so bothersome, loud, and overwhelming, I cover my ears. I now only hear the creaking of the floor and the steps of my fellow movers. I hear my own leg move. I hear my heart beat. I tap back to another mover. I barely move, it is mostly an auditory and internal exploration. When the activity closes the sounds outside are more manageable. I hear each individual noise for what it is. [...] It is less of a wall of sound.

Exercises such as the one above help differentiate D/MT from modern dance. While creative movement in general can be therapeutic, it can also be part of an implicit set of performance

and/or body standards, excluding many from experiencing its healing aspects. The movement in the D/MT exercise above is prompted simply by inner impulses, with no limits on who can participate, and therapeutically processed with a therapist present. It takes the creative, expressive, and healing parts of modern dance and gives them a safe space to be experienced by all.

Given my positive personal experiences with the practice, my curiosity grew for less traditionally cited use cases of the therapeutic modality, inspiring this thesis. My previous research on D/MT focuses on its application for conditions typically labeled as psychological. In this thesis, I center applications of D/MT on conditions we typically label as neurological, developmental, physical, and/or medical. This thesis includes three of these special populations: individuals on the autism spectrum, Parkinson's disease patients, and cancer patients. These populations were selected based on the relative abundance of supporting evidence for the use of D/MT – although for some areas, the literature is quite sparse. Of course, the distinctions between psychological conditions (which were the focus of the film) and non-psychological conditions (which are the focus of this thesis) are in many ways contrived and even harmful – anxiety has physical effects, just as cancer has psychological effects. The beauty of D/MT, however, is that it breaks down these distinctions of mind vs. body entirely, integrating all parts of oneself in the healing process. Similarly, this thesis aims to portray these three conditions through a holistic lens, emphasizing the necessity for healing approaches such as dance/movement therapy.

Dance/movement therapy and Autism

Mechanisms

The first application of dance/movement therapy that this thesis looks at is with autistic individuals. The autism spectrum refers to a set of neurological conditions affecting communication, socialization, sensory processing, and repetitive behaviors. The conditions develop within the first few years of life and can be caused by a combination of genetic, developmental, and environmental factors. Approximately 2% of children in the U.S. are diagnosed with autism spectrum disorder, or ASD (CDC, 2022). Recently, the term “ASD” has been criticized for over-pathologizing autism and reducing the broad spectrum of autistic characteristics into a singular medical “disorder” (**Figure 1**). Many advocate instead for a framework where autism is a set of behavioral or social/societal differences in processing and communicating between individuals (Bottema-Beutel et al., 2021). That said, differences and abilities vary widely within the autism spectrum. Some autistic individuals live with high levels of functional independence with little to no outside interventions, while others require intensive support to learn the self-care and social skills to live independently. Approaches to supportive interventions vary from behavioral and occupational therapies, to shifts in educational modalities, to medication for co-occurring conditions. Importantly, there is no “cure” for autism – nor, as many advocates have argued, should that be the goal (Bottema-Beutel et al., 2021). Instead, positive interventions focus on prioritizing the mental health of autistic individuals, their quality-of-life outcomes, their independence, and their particular needs and desires. Many autistic people and their caregivers still struggle to find accessible interventions that positively and effectively increase their well-being, communication abilities, and social support while

maintaining their agency, dignity, and individuality. Dance/movement therapy (D/MT) can fulfill those needs for autistic participants in a creative, holistic way.

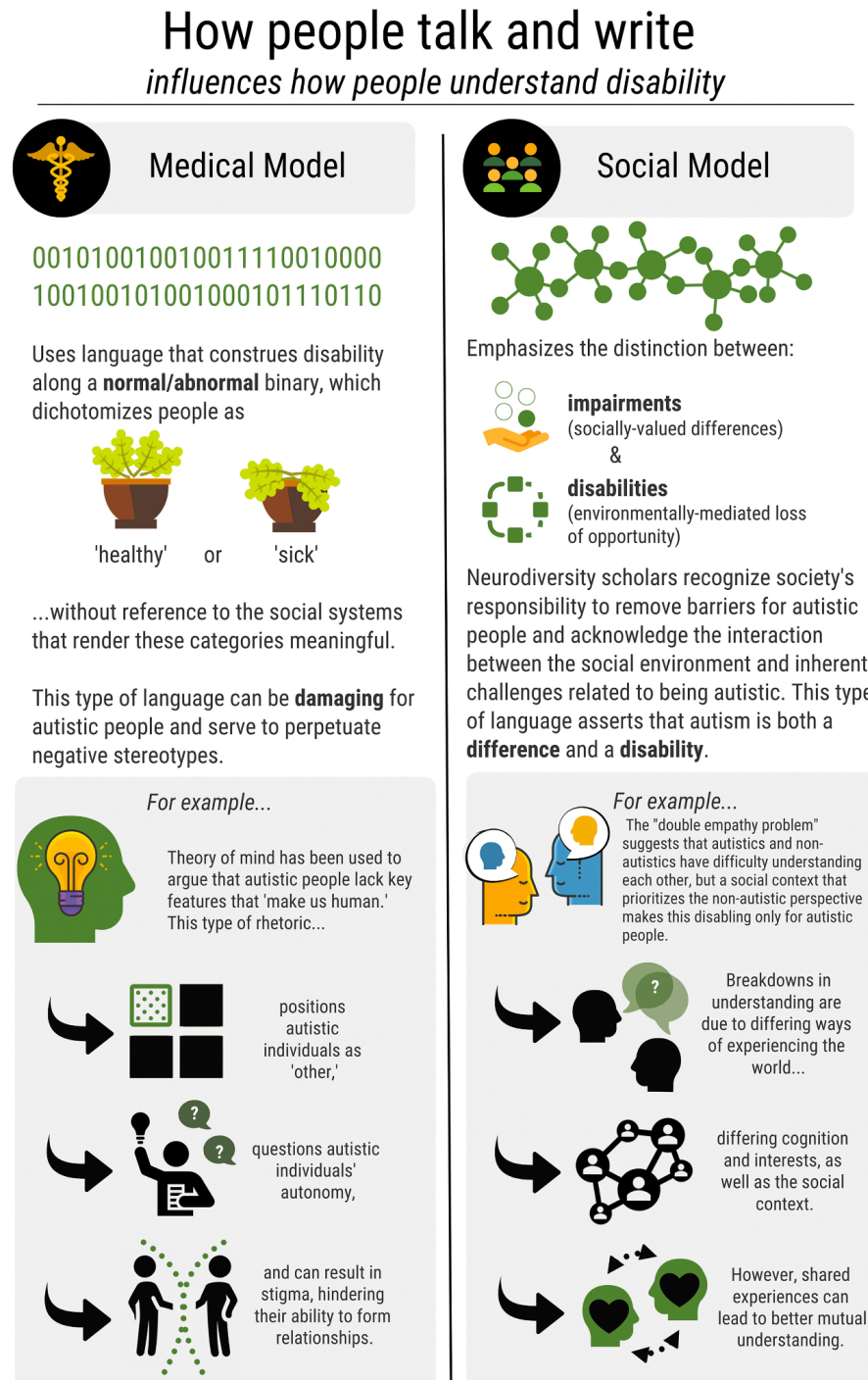


Figure 3. A new model for autism research and advocacy, from Bottema-Beutel et al., 2021. D/MT honors autistic perspectives and can help bridge communication gaps.

D/MT currently exists as an alternative, lesser-known support mechanism for autism under the category of creative arts therapies. Despite its current limited usage, the potential benefits for autistic individuals are extensive. As D/MT is inherently an individualized treatment modality, it is particularly well suited for use within the autism spectrum. D/MT addresses several areas impacted by autism. First, participants strengthen their attunement to external and internal stimuli through movement and mindfulness activities, which provide skills and coping strategies for people struggling with hypersensitivity to stimuli and/or sensation-seeking behaviors (Ben-Sasson et al., 2008). Attunement exercises also provide avenues for understanding empathy and relationship-building within groups (Behrends et al., 2012). Second, D/MT provides autistic participants an avenue to communicate on their terms, including through movement. D/MT can thus foster relationships between people who may otherwise struggle to communicate, given the wide variety of communication styles and abilities along the autism spectrum (**Figure 3**). Third, D/MT can address and alleviate the physical manifestations of autistic behaviors, such as repetitive motions and self-injurious actions, as needed. While most interventions for autism address each area of need on its own, D/MT simultaneously strengthens attunement, facilitates communication and understanding, and supports motor skill development. Thus, D/MT's holistic approach is a unique advantage among autism management strategies.

There is support for D/MT within autistic populations on a biomechanistic level. One proposed mechanism involves mirroring activities, a main feature of D/MT sessions for autistic participants. A mirroring activity begins with one person following a partner's bodily movements, either synchronously or slightly delayed; often, the line becomes blurred between leader and follower. In mirroring another mover, it is proposed that mirror neurons in the sensorimotor parts of our brain fire based on outside stimuli, such as seeing a partner in motion, witnessing others'

emotions, and watching people's facial expressions (Berrol, 2006). In a mirroring activity, we can achieve similar neurological and emotional responses as a partner simply by engaging in mirroring (Wicker et al., 2003). This type of kinesthetic empathy "extends beyond simply understanding the other's emotional state to embodying the experience of that state" (Berrol, 2006). D/MTs are specifically trained in movement analysis and can skillfully respond with relevant movement qualities, making D/MTs uniquely adept at facilitating these activities compared to other therapies (McGarry & Russo, 2011). For those on the autism spectrum who may have trouble understanding and communicating with non-autistic individuals – and vice versa – using these D/MT movement-based mirroring activities can help both parties develop a new language of embodied connection.

Literature Review

Although the benefits of D/MT for autistic participants are abundant, the scientific literature on the topic is slim. This thesis looks at only three recent studies that successfully measured the effects of D/MT in autistic populations (Koch et al., 2015; Koehne et al., 2016; Sengupta & Banerjee, 2020) and three scientific journal articles looking at the perspectives of educators, parents of autistic children, and a Dance/movement therapist are included (Devereaux, 2017a; Devereaux, 2017b; Champagne & MacDonald, 2022). The limited number of studies with statistically significant results is potentially due to the overarching challenges of quantifying and comparing a wide array of autistic characteristics (Takahashi et al., 2019). Small group sizes during D/MT sessions also limit data collection; most of the data we have is qualitative and observational. The following studies provide preliminary, yet promising, quantitative findings for D/MT's use for autistic populations.

A 2015 study by Koch et. al is one of the first recent studies that successfully linked dance/movement therapy mirroring exercises to improvements in autistic participants' self-awareness, socialization skills, and overall well-being. The researchers assigned 31 autistic (diagnosed with ASD) adults aged 16-47 to either a treatment or control group. The treatment group of 16 participated weekly in smaller group therapy sessions led by a dance/movement therapist for seven weeks. Each session consisted of a group warm-up circle, improvised mirroring activities between therapists and patients, then a group mirroring activity, and finally a closing processing session with words and illustrations. The researchers found significant increases in body awareness, self-other awareness, psychological well-being, and social skills in the treatment group compared to the control group. 13 out of 16 participants also marked on their post-treatment surveys that they would like to continue to attend D/MT sessions if offered in the future, indicating not only the benefits to the aforementioned measurements but an enjoyment of the process as well. Qualitative observations from the therapists confirm the data collected, as participants became more willing to participate in sessions, initiate movement, and bring their own music selection to class. This study's limitations include the small sample size and reliance on self-reporting from patients for quantitative data. However, it provides important insight into how mirroring-focused D/MT can contribute to self-awareness, group and partnership attunement, and overall well-being, contributing to the small but growing body of research promoting D/MT as an intervention and supportive treatment for autism.

In a 2016 study of 55 autistic adults, Koehne et al. further expanded on the Koch et. al (2015) results, finding an increase in emotional awareness and identification. The researchers separated participants, ages 18-55, into an experimental group of "imitation- and synchronization-based dance/movement intervention" (SI-DMI), a D/MT-based therapeutic

movement approach tailored specifically for autistic individuals, and a comparison control movement intervention (CMI) group. For each intervention, small groups met weekly for ten sessions. SI-DMI groups focused on mirroring activities, dance improvisation, group dance, and creative interpretation of everyday movements (**Figure 4**).

Function	Format/setting	Content
1 Brief verbal exchange and discussion of homework	Sitting circle	Opportunity to express needs and share state of mind; feedback on homework
2 Warm-up	Joint movement ritual	Movement sequence of increasing complexity
3 Movement expression and perception	Individual and interactive tasks	Variations of everyday movements like walking; movement observation; gradual introduction of different creative elements such as variations in expression and contrasting of a given movement
4 Main part	Interactive imitation and synchronization tasks in dyads, small groups, and the entire group	Imitative and mirroring tasks with variations and contrasting elements in different positioning in 2 forms: (1) improvised movement (of increasing complexity and variation) and (2) specified choreography (e.g. simple circle dances are learned and realized by participants over subsequent lessons)
5 Cool-down	Quiet self-perception tasks	Relaxation; self-focusing/awareness
6 Brief final verbal exchange and assignment of homework	Sitting circle	Feedback and opportunity to share movement experience; homework assignment

Figure 4. Session structure for groups receiving the Dance/Movement Intervention by Koehne et al., 2016. D/MT activities emphasize attunement, expression, and emotional regulation.

In the SI-DMI group, “empathy inference” (the ability to infer emotions based on physical expressions), mirroring skills, and synchronization abilities with a partner all increased compared to the control group. Participants in the SI-DMI group also showed more inclination towards spontaneously joining in dance with others compared to the control group. These results show how social-physiological treatments like D/MT can aid in emotional connection, social interactions, and attunement. These are areas that, for some autistic individuals, require alternative routes to either learn or be supported in, instead of current cognition-centering approaches. An embodied approach such as D/MT allows autistic participants to still engage emotionally and socially on each individual’s own terms. This study widens the field of research

on D/MT and autism because it has strong quantitative data, collected with computer-based tests and analyses rather than self-reporting. Together with the data from Koch et al. (2015), the study provides subjective understanding from participants as well as objective data from third parties.

A recent 2020 study by Sengupta & Banerjee provides more in-depth qualitative data on three autistic individuals requiring high levels of supportive care. This study similarly used mirroring activities to build the patient-therapist relationship. Two of the participants in the study arrived with treatment goals of distinguishing and accepting touch sensations. The therapist found in the youngest patient (age 3-5), by the end of the 24 sessions, they began to make eye contact as hands were held. This patient also displayed improvement in the ability to hold things by reaching for and grabbing the therapist's hands. The second participant, age 6-8, worked on withstanding touch via sensory items on the floor of different textures, sizes, and levels, eventually accepting gentle touch on the back. Other motor skills such as posture support and reducing self-injury were developed. For participants number 1 and 3, a sitting-up response was achieved through weight and movement exercises focusing on the back. For participant number 2, repetitive, self-injurious hand movements were slowed and managed through rhythmic clapping activities. The presenting problem of sternum hyperextension was also mitigated through sensory stimuli on the sternum, which eased body tension and helped with sternum positioning. This participant also gained more movement independence, as the researchers noted the patient was occasionally able to briefly walk without support during a session, another treatment goal. All of these physical results indicate social-emotional strengths as well: trust and attunement with the therapist, self-confidence in feeling independent with self-led movement impulses, and feeling safe in a variety of new stimuli. Together with the first two studies

discussed, the literature includes both qualitative and quantitative data on D/MT to benefit autistic individuals with social, emotional, and physical challenges.

The therapeutic relationship between patient and therapist is a core aspect of D/MT, so hearing from their perspectives is essential in evaluating D/MT in autistic populations. As described in **Figure 3**, thinking of communication between autistic and non-autistic people as a mutual two-way process removes the burden on autistic people to adapt to non-autistic ways of communicating. D/MT can be used to attune therapists and caregivers to autistic individuals just as much as it does those autistic individuals to the caregiver. Dance/movement therapist Christina Devereaux spoke about her experience co-regulating with her autistic patients based on the Polyvagal theory:

“The Polyvagal theory perspective assumes that many people with autism struggle to successfully engage in voluntary social behaviors due to their nervous systems receiving threats in their environment via neuroception – the neural circuits that we all have that distinguish whether situations or people are safe, dangerous, or life-threatening. It is as if the nervous system inaccurately detects a social environment to be dangerous where within the social context there is no risk. [In] dance/movement therapy, [...] by mobilizing without fear, the individual’s experience can be reframed so that the nervous system no longer has the expectation of chaos and danger. [Dance/movement therapists] start with paying careful attention to our own physical sensations and emotional activations. We can become a neurobiological regulator, which supports co-regulation in the therapeutic relationship. Understanding these principles can help us see clearly what is happening with people with autism and that, in turn, can grant us greater calm and

stability in the midst of dysregulation. [...] Our calm, attuned presence is the most powerful agent of neural integration that opens the door to movement and to deeper and more sustained connections.” (Devereaux, 2017a)

The framework of co-regulation through movement centers the therapeutic relationship in treatment, which can be applied in settings outside of therapy. For parents and caregivers of autistic children, co-regulation improves their and their child’s well-being through increased self-other awareness (Ting & Weiss, 2017). The D/MT framework can be applied in educational settings as well; in a 2017 study by Devereaux, educators noted that D/MT sessions in school helped autistic students with ease of transitions, emotional regulation, and body awareness. These educators also found personal benefit from participating in sessions with the students, noting “it brings us pleasure,” “it’s helpful for me to just get myself focused,” and “when it’s time to individually calm the children down it’s self-soothing myself” (Devereaux, 2017b). In a study with parents of autistic children participating in D/MT, similar personal benefits were noted; on average, parents responded that D/MT sessions significantly reduced the emotional burdens of caregiving and provided them with a heightened sense of emotional awareness (Champagne & MacDonald, 2022). Thus, D/MT can effectively address caregivers’ and educators’ needs in addition to each autistic individual’s needs, which is important in the co-regulation aspect of autism support. D/MT is unique in addressing the entire system around each individual, autistic or not, while taking into account needs, abilities, and setting.

Dance/movement therapy and Parkinson's Disease

Mechanisms

Parkinson's disease (PD) is a degenerative brain disorder that manifests primarily in motor dysfunction as well as co-occurring cognitive and behavioral difficulties, two areas of symptoms that dance/movement therapy can uniquely target. Approximately one million people in the U.S. live with PD, and it predominantly affects adults aged 60 and older (Marras et al., 2018). A variety of environmental and genetic factors contribute to PD development. PD starts when neurons in the basal ganglia, an area of the brain that controls movement, malfunction and/or die. The functions of neurons in the basal ganglia include motion, oculomotion (eye movement), associative tasks (linking sensory information to appropriate movement reactions), and limbic/orbitofrontal processes (emotional processing of sensory input). In PD, these areas of the brain experience cell death, which is why the main symptoms of PD are motor dysfunction and cognitive decline (**Table 1**). Additionally, there is a detrimental feedback loop with declines in motor function and behavioral/mental health. The physical effects of the disease can limit space usage and initiation of motion, as does depression, a biologically based symptom of PD (Burn, 2002). As movement lessens, depression can worsen, and as depression worsens, movement lessens, and thus the cycle reinforces the negative effects of PD. Parkinson's disease is thus disabling in many aspects of life (**Table 1**). Holistic treatment approaches are needed to address multiple areas of symptoms at once.

Table 1. The far-reaching symptoms of Parkinson’s disease, adapted from Jakel & Stacy (2014). Holistic treatment approaches such as dance/movement therapy can uniquely target both motor and non-motor dysfunction simultaneously.

Motor symptoms of PD	Non-motor symptoms
Tremors	Constipation
Muscle rigidity, cramping, and/or spasms	Autonomic nervous system dysfunction
Bradykinesia (slow movement)	Impaired sense of smell
Postural stooping	Dementia
Instability, falls, and trouble balancing	Depression
Micrographia (cramped handwriting)	Anxiety, fear
Blank expression	Trouble sleeping, fatigue
Retropulsion (backward-tendency of movement)	Psychosis
Hypophonic speech (weak or slurred speech)	Impulse control disorders

Non-motor-related symptoms are often reported as the most disabling aspects of the disease regarding quality of life (Chaudhuri et al., 2006). This may be due to the limited availability of treatments targeting cognitive effects. There is no known cure for Parkinson’s, although significant pharmacological interventions for the motor side effects of PD exist, with the drug Levodopa being one of the most effective and widely used interventions for patients with PD. That said, Levodopa does not treat certain motor symptoms such as freezing of gait or postural instability, nor does it ease cognitive symptoms of PD; in some cases, Levodopa worsens non-motor symptoms (Jankovic & Tan, 2020). Existing pharmacological interventions for the emotional symptoms of the disease, such as SSRIs for depression and anxiety, may potentially exacerbate PD symptoms, while other treatment options have negative interactions with other PD-related medications (Burn, 2002). The development of, and research into, non-pharmacological, holistic treatment options is important to successfully treat the multifaceted

disease. This thesis looks into the merits of dance/movement therapy in maintaining movement abilities, mental and physical strength, and supporting proprioception, all while prioritizing enjoyment within treatment.

While exercise overall has been shown to slow the progression of PD motor symptoms, dance programs offer more cognitive involvement, with dance/movement therapy specifically providing therapeutic aspects with trained mental health professionals in safe spaces. Studies have shown aerobic exercise regimens such as cycling reduce brain atrophy in PD patients (Johansson et al., 2022) and decreased PD symptom severity overall (van der Kolk et al., 2019). While beneficial for their at-home availability, individual exercise regimens do not provide social support and are not always feasible for those with severe motor dysfunction. Exercise programs in group settings with a physiotherapist supervisor have been shown to be significantly more effective at improving functioning in PD patients compared to at-home programs done by oneself (Dereli & Yaliman, 2010). Furthermore, routine aerobic exercises such as running or cycling do not involve the cognitive skills that dance does. Dance uniquely requires cognitive involvement to “plan and execute imagined movements, follow music and signals, remember repeated actions, and be aware of their own body [and...] emotions” (Hashimoto et al., 2015). On a neurological level, dance engages motor visualization and pre-motor areas of the brain, areas commonly negatively impacted by PD (Hashimoto et al., 2015). Dance engages multiple sensory systems (visual, auditory, somatosensory, and vestibular) all at once, a skill that often diminishes with PD (Fisher et al., 2020). Compared to control groups of non-dance PD-focused exercise, dance programs for individuals with PD also can improve motor functions such as walking abilities and balance (Hashimoto et al., 2015), prevent motor decline over several years (Bearss & DeSouza, 2021), and improve confidence in motor abilities, body image, and beauty

(Fontanesi & DeSouza, 2020). Socially, dance provides fun, safe, adaptable, community-based spaces for exercise as well as opportunities for expressive agency. These aspects of dance make it a uniquely enjoyable and effective treatment for PD compared to standard physical exercise.

The creative, individualized, and relational aspects of dance are all amplified in D/MT, which encourages movement initiation and a reclamation of agency, skills that often deteriorate as PD progresses. D/MT acknowledges the psychologically healing aspects of dance and adds trained therapists to the space to better support psychological processing. Compared to structured dance classes, D/MT has the benefit of being individualized, patient-initiated, and improvisational, conditions that mirror real life quite accurately. The “functional movement” of everyday life “does not typically follow pre-established patterns but requires spontaneous adaptation to the physical environment - it is improvisational” (Fisher et al., 2020). The therapeutic aspects of dance classes are magnified in D/MT sessions, but the principle that dance can be healing carries through between the two.

Literature Review

Despite the aforementioned potential benefits of D/MT for Parkinson’s, the scientific literature on the topic is slim. Only three studies with a specific focus on D/MT treatments for PD were found for inclusion in this thesis (Westbrook & McKibben, 1989; Fisher et al., 2020; Lihala et al., 2021). These were chosen as they were the only available studies focusing specifically on D/MT for PD. Given the obvious lack of available research, as well as lack of awareness and offerings of D/MT, it’s important to acknowledge that most non-D/MT dance programs for individuals with Parkinson’s are still strong treatment options that are typically more accessible, available, and affordable to individuals with PD.

Of the three available D/MT studies that this thesis analyzes, the earliest includes preliminary data from 1989 by Westbrook & McKibben. The researchers led two groups of 37 participants total, all with PD, in weekly D/MT sessions or control exercise sessions. One group had six weeks of D/MT followed by six weeks of regular group exercise, and the second group had the reverse schedule. D/MT sessions consisted of group movement warm-ups, “movement themes” of the day, and a discussion-based closing circle. PD symptoms were evaluated for all participants at weeks 0, 6, and 12 via movement observations, short physical tests, and psychological self-assessments via surveys. The researchers reported statistically significantly higher walking speeds in physical assessments after six weeks of D/MT but not after the control exercise for both trial groups. The researchers found no significant change in depression via the self-assessments in any groups. Despite the researchers mentioning several evaluation criteria, the only two results mentioned are the increased walking speeds and steady depression ratings. While the study reflects increasing acceptance of D/MT as a physical rehabilitation method for PD, it also reflects the lack of data available at the time. All we can gather from this brief study with few participants is one specific data point – increased walking ability. While dance and movement continued to be used to treat Parkinson’s, the next available studies that focus specifically on D/MT and PD were published thirty years later.

A 2020 study done by Fisher et al. shows the power of D/MT to treat PD holistically. Ten adults with PD were recruited to attend ten weekly D/MT sessions. Each session consisted of an opening settling into the space, group warm-ups, movement improvisation, and a discussion-based processing segment to close. At the start and end of the study, motor and cognitive skills were assessed, with considerably more variables included compared to the first 1989 study. Motor-based skill measurements included balance, spatial orientation, and mobility. Cognitive

skills measured included memory, attention, gestural capabilities, visualization, and verbal abilities. On average, motor abilities significantly improved, with each individual participant increasing scores on the motor-skills assessment overall (**Figure 5A**). Five out of the six motor functions assessed significantly improved among the participants: biomechanical constraints (such as body part strength and range of motion), sitting/standing stability, anticipatory postural adjustments (such as sitting, rising, and shifting weight), sensory orientation (body sway during adjustments), and walking stability (**Figure 5B**). Average cognitive abilities of the participants significantly improved in one of the four cognition-based assessments (Marinus et al., 2019). The improved measurements were verbal and nonverbal memory, quantitative reasoning/attention, executive function, verbal fluency, and pattern recognition.

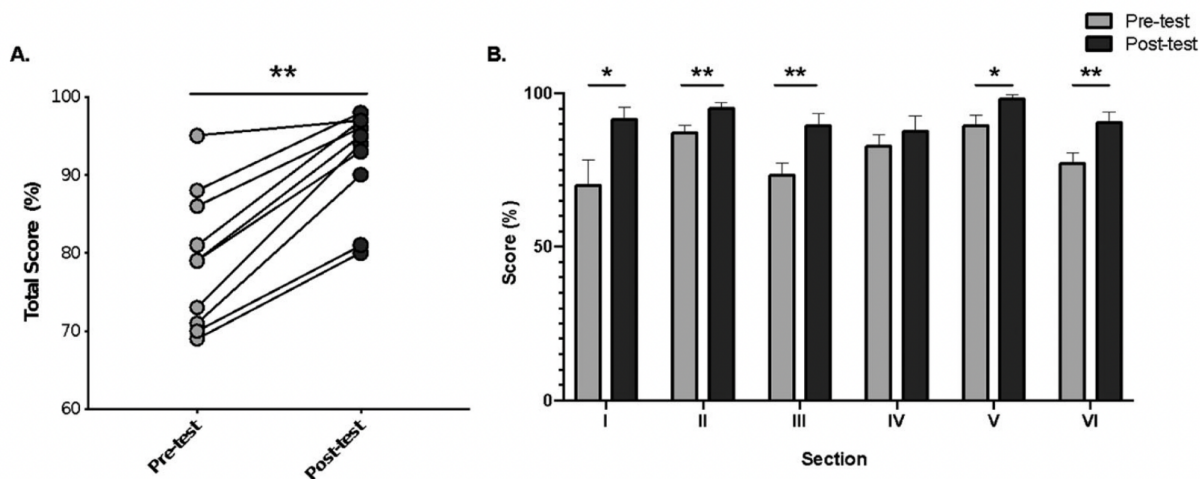


Figure 5. Motor function improvements after ten dance/movement therapy sessions (Fisher et al., 2020). Motor skills were assessed using the Balance Evaluation Systems Test (BESTest) before starting the study (“pre-test”) and after the ten sessions (“post-test”). **A.** The total score of all ten patients improved significantly, and all participants showed individual improvement. **B.** Several individual categories of the BESTest improved with statistical significance. Categories are: I. Biomechanical Constraints (eg. body part strength and range of motion), II. Stability Limits/Verticality (eg. sitting and standing stability), III. Anticipatory Postural Adjustments (eg. ability to sit, stand, and shift weight), IV. Postural Responses (pushing/pulling against a force), V. Sensory Orientation (eg. body swaying during adjustments), VI. Stability in Gait (eg. balance while walking) (Horak et al., 2009). Total scores in sections I, II, III, V, and VI all increased significantly. Statistical significance: * $p \leq 0.05$, ** $p \leq 0.01$.

These results show that D/MT can simultaneously ameliorate motor and cognitive symptoms of PD in just ten sessions. The study is not without its limitations; changes in emotional well-being and quality/satisfaction of life are not reported, there are only ten subjects in the data, and there is no control group. Still, the statistically significant, quantitative data shows tangible benefits of D/MT, which will hopefully encourage further research in the upcoming years.

A similarly structured study in 2021 by Lihala et al. showed similar motor and cognitive results as Fisher et al. (2020), in addition to higher quality of life measurements. Six participants with PD attended twice-a-week sessions for two months for a total of 18 sessions. Motor and cognitive functions were measured at the start and end of the study using quantitative PD assessments, and overall well-being was gathered from individual patient interviews upon completion of the study. Sessions consisted of a group check-in, a group warm-up, a series of activities focusing on the physical, emotional, and cognitive goals for the day, and a closing relaxation session and processing. The results show statistically significant improvement in two test scores. Scores improved on the Montreal Cognitive Assessment, a test that looks at memory, visuospatial abilities, executive function, language, and orientation (MOCA, 2015). Quality of life also improved with the Parkinson's Disease Questionnaire 39, with lower scores after the D/MT sessions, indicating reduced difficulties in daily living (PDQ-39, 2020). The other three motor-related assessments showed no significant changes, but given the robust data showing dance, exercise, and movement in general are beneficial for individuals with Parkinson's, this is likely due to the small sample size of six participants. Although the quantitative data of statistical significance is limited, it still affirms the positive effects of D/MT on cognition and well-being. The study also includes promising qualitative data indicating participants' enjoyment of and benefits from the sessions. One participant spoke of increased initiation of movement outside of

sessions, stating, “I try to initiate new activities all the time;” others spoke of their decreased anxiety, feeling “fresh and good after the session,” and called the experience a “mix of pleasure and exercise” (Lihala et al., 2021). For there to be improvements in cognitive abilities along with well-being and ease of functioning, all during an enjoyable treatment, speaks highly of D/MT’s potential. No matter how effective a treatment may be, enjoyment in a session is still important to consider, as participants will be less likely to attend if it is unpleasant. For a disease that significantly impacts cognition, quality of life, and socialization, incorporating social connection and pleasure into treatment is key to its attendance and success, and this study shows D/MT can work well in these areas.

Despite the minimal research specifically studying D/MT as a treatment for PD, D/MT remains a highly promising treatment approach. Importantly, it is an effective intervention both on its own and in combination with PD medication. The Parkinson’s Foundation and the American Dance Therapy Association both endorse D/MT for individuals with PD (Parkinson’s Foundation, 2017; ADTA, 2013). Existing research noting the benefits of dance in general for PD patients, as well as research on D/MT for other neurodegenerative diseases, bolsters the few studies we do have on D/MT and Parkinson’s. While it’s important to keep the distinction between D/MT and dance classes in mind, the principle that dance can be healing carries through between the two. For now, any form of therapeutic dance can be effective as D/MT research and offerings grow.

Dance/movement therapy and Cancer

Mechanisms

The final application of dance/movement therapy (D/MT) that this thesis looks at is with cancer patients. Cancer is a cellular disease with over 100 subcategories. The disease is caused by random genetic mutation, inherited genes, and/or environmental carcinogenic factors such as smoking or sun exposure. Cancer occurs when cell division becomes unregulated in the blood, tissue, and/or organs. Cancer cells can clump together to form tumors, which can interfere with the body's normal functions. In blood cancers like leukemia, cancer cells can cause damage by entering the bloodstream. Physical symptoms are widespread, including fatigue, pain, nausea, weight loss, and nervous system/immune system dysfunction (**Table 2**). Nearly two million new cases of cancer are diagnosed in the U.S. each year, and an estimated 40% of individuals will be diagnosed with cancer in their lifetime (National Cancer Institute). Mortality rates vary depending on subtype, but cancer is the second leading cause of death in the U.S., with nearly 600,000 deaths per year (American Cancer Society). While survival is possible with proper treatments, the widespread disease is both physically damaging and mentally distressing (**Table 2**). Dance/movement therapy is a powerful tool for coping with the disease.

Table 2. Common side effects reported by cancer patients, from the American Cancer Society.

Blood	Cognitive and Emotional
Low red blood cell counts (anemia)	Anxiety
Low white blood cell counts (neutropenia)	Confusion
Low platelet count	Depression
Fever	Delirium
Infections	Fatigue
Blood clots	
Weakened immune system	

Bladder, Bowel, Eating & Drinking

Bladder and bowel incontinence
Constipation
Dehydration
Diarrhea
Hiccups, heartburn
Loss of appetite
Mouth sores and pain
Mouth dryness or thick saliva
Nausea and vomiting
Taste and smell changes
Swallowing problems
Urine retention
Weight changes

Nervous System

Peripheral neuropathy
Seizures
Pain

Hair, Skin, and Nails

Hair loss
Hot flashes and sweating
Nail changes
Dry skin
Itching
Skin rash
Skin color changes
Pressure sores

Other

Balance problems and falls
Cramping
Fertility & sexual concerns
Sleep problems
Shortness of breath
Surgical removal of body parts
Swelling
Weakness

Treatments for cancer depend on the stage and subtype of the disease. Treatments range from curative (treating the disease itself) to palliative (easing symptoms). There is no singular curative treatment option for cancer, and not all interventions are accessible, affordable, or offered to all patients. It often takes a combination of treatments to lead to remission, when no signs, symptoms, or detectable cancer cells remain. Common medical interventions include chemotherapy, which kills rapidly dividing cells typically through an IV; surgery, which can shrink or remove a tumor; radiation therapy, which damages cellular DNA in a targeted area; hormone therapy, which kills hormone-dependent cancer cells by targeting hormone production; immunotherapy, which boosts the patient's immune system; and stem-cell transplants, which replaces cells that have been destroyed during the aforementioned cancer treatments (National Cancer Institute, 2017). While effective at reducing and removing cancer cells, almost all of the aforementioned treatments cannot distinguish cancer from non-cancer cells during treatments,

which often leads to healthy cells being damaged. Side effects from cancer and its treatments are widespread, vary between treatments and patients, and range from mild to severe (**Table 2**). The profound physical and mental toll that treatment often takes on patients makes holistic, palliative care an important aspect of successfully undergoing difficult treatments. D/MT can provide this care to ease the mental and physical side effects of cancer and cancer treatments on an individual and group level.

D/MT stands out among other palliative treatments for its comprehensive, therapeutic, relationship-based approach. It can release muscle tension, improve patients' ability to tolerate treatment, reduce anxiety and pain from treatment (thus increasing attendance at treatment sessions), restore a sense of autonomy and control over treatment through patient-led movement, and reduce isolation of suffering through patient/therapist relationship (Goodill, 2018). It is important for patients to have access to care that focuses on healing rather than curing. Medical D/MT expert Sharon Goodill explains this distinction: "curing is the actual eradication of a disease, while healing implies a sense of wholeness... for patients, simply feeling better can be the most important outcome" (Goodill, 2005, p. 26). Anna Halprin shared a similar outlook: "Someone with a strong will to live, someone who is willing to believe in the power of dance, someone who is determined and will not give up, has a better chance of surviving cancer than someone who blindly follows the advice of doctors and does not participate in her own healing.[...] It is, of course, our greatest ideal to be both cured and healed" (Halprin, 2000, pp. 14-15). Treating a disease at its root is important for survival, and truly healing, in terms of self-image, quality of life, and ease of function, is what makes survival worthwhile. Together, conventional medicine and D/MT offer a comprehensive treatment approach.

Literature Review

The efficacy of dance/movement therapy for cancer care has been increasingly supported through scientific literature in recent years, although supportive quantitative data is severely lacking. D/MT has typically been placed in the category of “complementary and alternative medicines,” a wide category that includes yoga, meditation, massage therapy, medicinal plants, and hypnosis (National Cancer Institute, 2022). This broad categorization may incorrectly imply that D/MT is an alternative medicine, and is thus experimental, not supported, or even dangerous. It is more accurate to say that D/MT is a complementary therapy because it works alongside traditional medicine, not as a replacement (**Figure 4**). This thesis finds no evidence of D/MT as a miracle cure for cancer, nor does the field of creative arts therapy claim this. Rather, the literature included in this thesis shows the scientific evidence backing the efficacy of D/MT as a complementary therapy. This thesis looks at three studies of D/MT in cancer patients through this lens: two in adults with cancer undergoing active treatments (Ho et al., 2016; Millrod, 2020) and one larger pediatric cancer D/MT model from medical D/MT expert Suzi Tortora (2019). These types of scientific studies are important to legitimize the practice. Scientific approval will likely lead to increased educational offerings for training future D/MTs, and thus more D/MT session availability and offerings; insurance covering D/MT sessions, increasing financial accessibility among patients; and overall acceptance into the medical field.

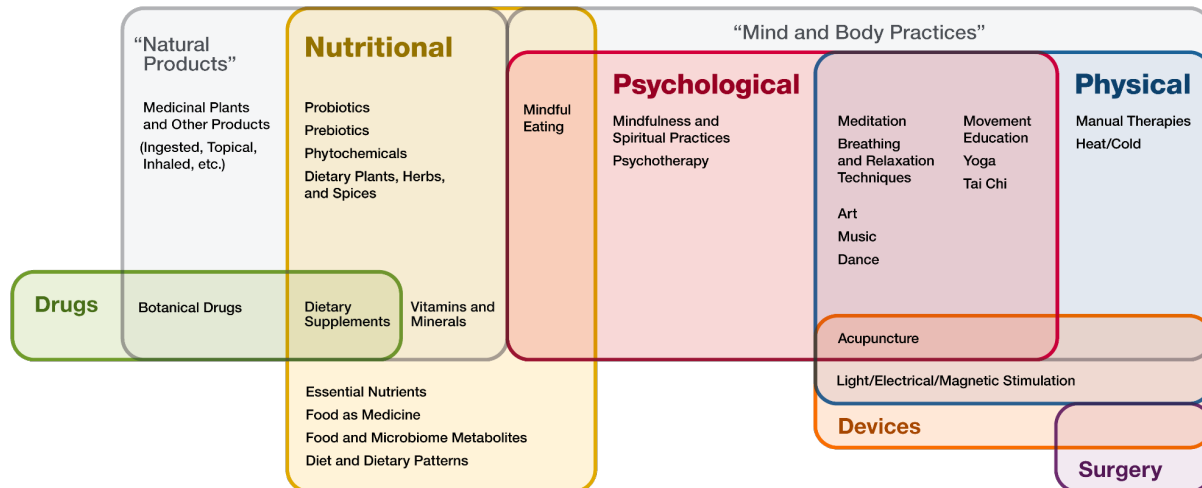


Figure 4. Graphic from the National Institutes of Health depicting and categorizing complementary health approaches (NCCIH, 2021). Complementary medicine is used together with conventional medical treatments to treat the whole person. In cases of cancer, dance/movement therapy is a complementary intervention that encompasses both psychological and physical healing.

One of the first studies with both qualitative observations and quantitative data provides a promising model of D/MT for cancer patients during and after radiation therapy (Ho et al., 2016). The study included 60 patients undergoing active radiation treatment and 44 patients who had completed radiation treatment. Both groups received 3 weeks of twice-weekly D/MT sessions. Each session was generally structured similarly, beginning with an opening warm-up, gentle rhythmic movement, group movement, closing discussion, and relaxation. After the three weeks, participants filled out open-ended questionnaires to report whether they found the D/MT sessions helpful and why. Responses were coded and sorted into categories. The researchers identified five overall themes of the 104 patients' post-D/MT surveys: Coping with Cancer, Treatment, and Physical Symptoms (59 total mentions); Mental Well-Being and Internal Connections (75); Total Functioning (25); Bridging Back to a Normal and Better Life (11); and Shared Positive Experience (21). Sample qualitative, patient-provided feedback on the D/MT

includes: “Time passes by faster,” “My whole body (hands, feet, waist, head) was improved,” “It gradually relieved the pain in my bones and muscles,” “It has given me more vigor,” “I felt relaxed and learned to release my stress,” “My emotions became more stable,” and “[The group gave] me the will to fight on.” Of these responses, the two most reported benefits of D/MT – coping skills and mental well-being – had statistically significantly higher mentions from the in-treatment group compared to the post-treatment group. The higher benefits listed in the active treatment patients suggest that D/MT is uniquely fit to ameliorate in-the-moment pain and anxiety compared to typical psychotherapy or physical exercise after cancer treatments have ended. The large sample size of the study provides us with an abundance of specific, first-hand evidence on the benefits of D/MT for cancer patients, especially for those actively undergoing medical treatment. While a drawback of this study may be that aggregating data from a wide array of patients ignores differences in experiences among cancer diagnoses, it is beneficial to have such an abundance of quantitative data to achieve statistical significance.

A more recent study investigating individualized D/MT in the infusion room for cancer patients elaborates on the healing capabilities of D/MT during active medical treatments (Millrod, 2020). Seven of the nine individuals undergoing in-hospital medical infusions included in the study were diagnosed with cancer. A D/MT joined each patient during each of their infusion sessions for one hour, anywhere from two times a week to once every three weeks depending on their treatment schedule. Sessions were individualized in terms of treatment goals and structure. Common goals included supporting patients through pain and distress, strengthening coping mechanisms, and restoring a sense of connection to the body. Typical sessions included an opening verbal discussion, relaxation and mindfulness exercises, movement warm-ups, patient-directed movements, and closing reflections. The physical side effects of

treatments combined with practical restraints from infusion lines limited patients' movement ranges. Nonetheless, patients and therapists created gentle, simple, and mindful movements during infusions. No quantitative measures were reported; however, promising observations by the D/MT are included. The following is an excerpt from Millrod (2020) showing how one patient's intense mental and physical side effects from cancer treatment were successfully mitigated using D/MT.

One patient in particular struggled with anticipatory fear—she was afraid of the side effects that she would have to endure at home for several days following each chemotherapy session. The thought of getting infusion was enough to trigger anxiety characterized by pressured speech, high body tension, elevated blood pressure, restlessness, and rapid, shallow breathing. [...] Using breathing techniques, imagery, and touch, the patient learned to down-regulate her anxiety. [...] She explored different ways to yield her weight to gravity, experience movements that were light, gentle, and sustained so that she can slow down and take care of herself [...] all so that she can better navigate the challenges of her cancer treatments. She ultimately kept all of her appointments in the infusion room and completed her chemotherapy.

As stated above, mindfulness activities created “comfort and safety” within patients before treatments and became a coping mechanism they could use outside of sessions to tolerate discomfort. Breath-based movements allowed for “the release of tension” and aided in pain management throughout the session. The patient-led movement “engaged patients as active participants in their own therapy, not passive recipients of treatment,” restoring their sense of

agency and safety within the body “as a home for the self.” Safety, agency, self-trust, and mind-body connection are essential for patients who may feel that their body is an object, unreliable, out of their control, and/or a danger to them due to their cancer and cancer treatments. D/MT uniquely addresses pain and anxiety management before, during, and after treatment, ensuring patients show up and complete treatments. D/MT is also oriented toward the mind-body connection, unlike traditional unimodal therapies. The achievement of these key treatment goals makes a strong case for the proposed model of individualized D/MT during active cancer infusion treatments.

Medical D/MT expert Suzi Tortora expands on these previous findings with a D/MT model for participants with pediatric cancer (2019). Cancer can be particularly traumatizing for children as it negatively interferes with their rapidly developing emotional awareness and sense of empowerment. Her extended case studies exhibit how D/MT can give children the expressive skills to work through their experiences and continue to grow while emphasizing the joy of playful movement and dance. In one case study with a four-year-old patient, Tortora uses creative, physical storytelling to embody what moving through physical challenges looks like. She and her patient begin the session by going on an imaginary “bear hunt” based on the child’s initiation. She notes the patient begins appearing “restless and mournful” as he awaits treatment, but as the D/MT session progresses, his “actions become more determined and stronger.” During the imagined bear hunt song and dance, he “[takes] up more space ... with increasing conviction.” The bear hunt becomes a metaphor for his treatment situation, and the two work through emotional and physical challenges that arise. Through mirroring, connection, the grounding presence of a therapist, creative movement, and symbolic imagination, the young patient is better able to handle the forthcoming treatment.

Tortora uses a similar, creative approach to embody the relevant feelings that arise during cancer treatments in a D/MT group with children aged four to eight and their family members. In the case study, she describes leading the group on an imaginary, group-generated “journey.” Using movement, rhythm, and sound, the group improvises together, imagining that they face ocean waves, swimming in a current, sharks, and floating back to the surface. Afterward, the group processes feelings that arose such as fear, empowerment, bravery, endurance, and safety. The group subconsciously created a metaphor for cancer and cancer treatments using the sharks and stormy weather imagery. This creative, physical, therapeutic activity gives children a model for understanding and processing the complex processes of cancer, cancer treatments, and the accompanying emotions. In this case study, we see D/MT provide holistic support to the entire support system around a pediatric cancer patient. Social support helps children cope with their disease and keeps development on track. Caregivers are better able to co-regulate with their children as they learn coping skills to process their emotions. Thus, the flexible, holistic approach of D/MT can uniquely support children, caregivers, and anyone else who has survived or is actively treating cancer. These more qualitative studies in many ways communicate these findings better than quantitative data could, as emotion, narrative, and individuality are all honored.

Discussion

This thesis serves to promote awareness and understanding of D/MT as a creative healing approach outside of its typical uses; survey and evaluate the literature; and assess data methods for studying D/MT. D/MT can successfully aid autistic individuals by strengthening attunement skills, providing creative communication outlets, and relieving harmful physical manifestations

of autism. D/MT can provide relief for Parkinson's disease patients by reducing cognitive and physical symptoms and slowing disease progression. D/MT can give cancer patients coping skills to manage psychological and physical pain before, during, and after treatment. The wide range of efficacy speaks to the adaptability and individualization of D/MT as well as the overall validity of holistic healthcare approaches. Chaiklin & Wengrower (2015) emphasize the importance of these values, as "people need and want to be recognized for their humanity and not merely by their disability." While typical medical approaches to these three conditions may reduce people to their disability, D/MT takes an integrated approach.

This thesis shows how D/MT works on a short-term (weeks to months) timescale to improve well-being; for patients with Parkinson's disease, and especially patients with cancer, D/MT may even prevent negative responses years later. Providing support through D/MT during intense, high-stress medical situations may prevent trauma responses later on, as the lack of social support during and after traumatic events (which would include many of the severe effects of PD and cancer) is a big risk factor for the development and severity of posttraumatic stress disorder (Robinaugh et al., 2011). In typical medical treatments, psychological health is often overlooked; typical psychotherapies tend to ignore the physical body. Therefore, somatic approaches to health such as D/MT are uniquely equipped to comprehensively address physical realities and psychological processes.

The research on D/MT, especially in non-mental healthcare settings, is nowhere near exhaustive. Unfortunately, there is a feedback loop present where few people know about D/MT, so few D/MT programs exist; since few programs are offered, few people know about D/MT. The same goes for research: since non-typical D/MT uses are rarely studied, D/MT is rarely implemented in these non-typical cases, and vice versa. The data that we do have suffers from

small sample sizes, despite small group therapy sessions being the most common and more effective for the patient-therapist relationship. While the fact that D/MT is adaptable and treats each patient as an individual is a strength compared to other treatments, it is a weakness when it comes to scientific study. The scientific community's preference for quantitative (numerical) over qualitative (descriptive) data may dismiss the validity of many personal experiences in D/MT. There may not be a way – now or ever – to quantify joy, spiritual wellness, psychiatric progress, movement qualities, etc. accurately and/or completely. Thus, quantitative data may not be the only way to validate D/MT as a healthcare intervention. While many may advocate for more quantitative data before implementing D/MT, the robust qualitative data and personal anecdotes make a convincing case for its practical application.

Limitations of D/MT also stem from the field itself. D/MT is a westernized version of healing through dance which has existed in non-western cultures for much longer. The most prominent founders of D/MT are all white women who, in the 1970s, took these practices and put a name on them. As D/MT Meg Chang notes, “in the period from the 1970s through the 1990s, the field was predominantly White-European in appearance and in dance forms, [and] sociocultural background was largely ignored in D/MT,” perpetuating harm and limiting D/MT's effectiveness. While Chang acknowledges that “there is now heightened student [and educational] awareness of the impact of racial, cultural, and gender identity” on life experiences, she maintains that the “predominately female, heterosexual, white, upper-middle-class, and urban profession [...] still swims [in the] water of privilege” from the founders' time. D/MT must address this massive area of reformation before it can reach its full potential.

Chaiklin & Wengrower (2015) take an optimistic stance on the ability of D/MT to acknowledge the field's exclusion and harm while positively reforming itself. They agree with

Chang: “Without first critically examining subtle forms of racial, ethnic, and cultural bias that exist in DMT education and practice, there is a danger of foreclosing communication among socioculturally diverse students and educators, between therapist and clients, and among community participants and facilitators of community-based healing arts events.” They propose that by “identifying and bringing racial, ethnic, and cultural issues into conscious awareness and seeking the personal and social roots of contested issues, mutual solutions can be discovered and danced. [S]elf-knowledge about, and intimacy with, the dance/movement therapist's own sociocultural identity increases his or her ability to work with clients, colleagues, and community members who are from different backgrounds. Such personal growth, in turn, has the potential to extend the scope and viability of the field.” The principles of D/MT are about self-other understanding, healing, and movement for all, which in many ways are synonymous with diversity, inclusion, and intercultural understanding; thus, a more inclusive D/MT practice is a better D/MT practice.

Given the limitations discussed above, alternative ways of accessing the therapeutic aspects of dance are worth considering. As mentioned, dance as a healing art is not new, and many communities (often marginalized in the U.S.) have been practicing some form of movement in community long before D/MT was formalized in the 1960s. Even within stylized forms of dance such as Tango or Hip-Hop we see the principles of D/MT emerge: social support, connecting and communicating through movement, creative expression, etc. In my summer research, I noted these benefits in contact improvisation jams: “Being able now to discover more improvisational types of dance [...] feels very healing and freeing, and almost therapeutic in a way” (Zanobini, 2022). In a way, D/MT simply formalized what many of us already know and practice: expression and connection through movement.

In an interview in the film, Cecilia Fontanesi, a neuroscientist and dance/movement therapist – cited earlier in this thesis for her work on dance and PD – elaborated on how improvisational dance can facilitate healing:

Within the art of dance, there are potential therapeutic processes. I say ‘potential’ [...] because these dynamics [...] are not necessarily experienced. You could experience detrimental processes – maybe [...] a performance standard, a body standard, a movement standard, a skill standard.

However, I think the root of the practice is actually healing. [...] The relationship to the natural forces, because we have to relate to gravity and momentum, [...] is a level of connection that is therapeutic. When we enter into contact with somebody else, other human beings, there are plenty of things that come from the experience of touch and the experience of shared leadership. The idea of taking risks and trusting ourselves and trusting others. We rehearse ways of falling, our resiliency skills, standing up when you fall down, and our deepest capacity to adapt to whatever happens. [...] These are things that are life skills.

Dance gives us a creative, expressive outlet to build the “life skills” Fontanesi discusses above. In an ideal world, D/MT would be affordable and accessible for all, and perhaps increased research will aid in this. Until then, the benefits may be accessed in other forms of dance and movement. Applying the D/MT framework outside of just D/MT sessions encourages us all to stay connected to our minds, bodies, emotions, communities, and life itself.

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Appendix

Notes from a D/MT session as part of my summer research in New York City, June 2022.

DANCE/MOVEMENT THERAPY CLASS @ GIBNEY

SAT JUNE 18

Today we are doing Authentic Movement where one person moves according to any/all movement impulses with eyes closed while their partner witnesses them from the sides of the room. As the mover - my first role:

- ① I move almost entirely connected to the wall and floor. My body melts into itself with the corners of the room holding me. I turn and roll which seems to massage my body (sore from yesterday's dance class). My head curls into my belly, then I expand back into the floor. I feel super grounded (literally!) to the room and to my body. I open my eyes and my partner is there, witnessing me, holding space for me, I am never by myself - I am supported in lots of ways during this exercise (the wall, the floor, my witnesser, the teacher, etc.)
- ② As the witnesser: My partner begins sitting as he typically does at the start of each class (arms and legs crossed). He doesn't move at all for the first minute or so. Then his hands started to trace a path on the floor. Eventually he became so interested in the sensation (I assume) his whole back of the hand was in contact with the ground, then his forearm, then even his hips and legs followed. Finally his hands traced this path in the air. He opens his eyes and his hands stay on the ground. I feel completely attuned to him at this point, yet I wonder what he was exploring - what did it feel like for him? Reminder that it does not need to make sense - it can just be. Being seen for the sake of being seen.
- ③ This time I am moving again, more grounded, so I immediately hear the traffic sounds outside. These are so bothersome, loud, and overwhelming I cover my ears. I now only hear the creaking of the floor and the steps of my fellow movers. I hear my own leg move. I hear my heart beat. I tap back to another mover. I barely move, it is mostly an auditory and internal exploration when the activity closes the sounds outside are more manageable. I hear each individual noise for what it is. I hear birds. It is less of a wall of sound.
- ④ This time I witness again. He begins in his usual crossed seat and slowly over the five minutes becomes stretched, gentle, vulnerable, open. I wonder if this is rare for him. Is he usually wound up? He ends more open, more relaxed, seemingly. Maybe I am projecting. (He says it was fun.)