Spring 5-18-2024

Regulation Through Rhythm: A literature Review on Dance/ Movement Therapy Approaches To Facilitating Nervous System Regulation

Elizabeth Barbera
ebarbera@lesley.edu

Regulation Through Rhythm:

A Literature Review On Dance Movement Therapy Approaches To Facilitating Nervous System Regulation

Capstone Thesis

Lesley University

5/4/24

Elizabeth Barbera

Dance Movement Therapy

Wendy Allen, PhD, LPC, BC-DMT

Abstract

The mental health field has started to pay attention to how trauma plays into a person's overall mental and physical well-being. Because of this more research has shown the connection between mind and body. Yet the clinical implications and literature on theories of how to treat trauma and trauma related disorders do not always connect. This review of literature seeks to analyze the literature on Porges', Polyvagal Theory and Amighi's, Kestenberg Movement Profiles. An investigation of the current literature makes a connection between the phylogenetic order of both the nervous system and developmental movement. Considerations of how trauma, in particular childhood trauma, can impact the development of the internal systems and the overall individual experience with the world are noted. Both internal and external body rhythms such as the heart, breathing, and movement coping skills will be explored.

Keywords: trauma, mind-body connection, Polyvagal Theory, Kestenberg Movement Profiles, developmental movement, window of tolerance

Author Identity Statement: The author identifies as a white cis-gender female from New England of mixed European Ancestry.

Regulation Through Rhythm: A Literature Review On Dance/Movement Therapy Approaches To Facilitating Nervous System Regulation

Life is about rhythm. We vibrate, our hearts are pumping blood, we are a rhythm machine, that is what we are. – Mickey Heart

The more you practice following your own rhythm, the more rhythmic your life will become and the more your dance with life will be in sync. -Borbala

There is rhythm in everything we do. When thinking of rhythm, the first thought that tends to come to the mind is music. To expand that thought, every movement living things do has a rhythm as well. Whether it is the beating of the heart, the swaying of the hips, the nodding of a head, or the tapping of a foot - the body provides a way to look introspectively and embody what is happening inside and out. Over the last few decades, the thought of a mind-body connection has grown stronger and larger (Mate, 2019; Menaken, 2021; Ortner, 2014). The Polyvagal Theory, created by Steven Porges is a theory that has expanded the mind-body connection research and it's clinical applications. The theory investigates the human anatomy to help understand and describe how and why people interact with their inner and outer world in the way that they do. Porges looked at the autonomic nervous system and theorized that our nervous system has evolved throughout the years to create three sub systems. These three subsystems are phylogenetically ordered and are behaviorally linked to communication, mobilization, and immobilization (Porges 2001). Porges' creation of the Polyvagal Theory has added to the discussions and research around how trauma and stress equally impact the mind, body, and social aspects of life.

Polyvagal Theory is unique in that it offers important insights as to the validation and explanation of symptoms and behaviors often associated with stigmatized diagnoses. The theory adds to the "what has happened to you" understanding of an individual and opens a scientific understanding of an individual's threat response outside of learned behavior (Johnstone 2018). Polyvagal Theory proposes a hierarchical response strategy to environmental challenges with the most recent modifications employed first and the most primitive last (Porges 2001). Understanding the biological systems that impact how people interact with their inner and outer worlds can become useful information to clients and therapists for acceptance and treatment planning.

The implications and findings of Polyvagal Theory help reinforce the principles that dance/movement therapists have been working with for decades. Dance/movement therapy is defined by the American Dance Therapy Association (ADTA, 2020) as the psychotherapeutic use of movement to promote emotional, social, cognitive, and physical integration of the individual. Dance/movement therapy works with the relationship of the mind, body, and lived experiences of each individual. It has become an integrated clinical practice among populations by creating felt spaces of safety, community, and exploration through verbal and nonverbal processing. Being able to process through verbal and nonverbal modalities is especially important when working with clients who have experienced trauma.

Fortunately, there is movement in every stage of life, from kicking in the womb to the last beat of the heart. The work with dance/movement therapy can help clients to drop into their bodies and explore what movement looks and feels like during each stage of life. The work can occasionally take a person to previous developmental movement patterns, allowing the person to

explore with curiosity what they need from that stage of life. The role of the dance/movement therapist is to hold the space while allowing the journey of movement to happen.

Dance/movement therapists often work with developmental movement and children to promote healthy development and connection. (Bonnie Bainbridge Cohen, 2018; Janet Adler, 2009; Suzy Tortora, 2010). A dance/movement therapy idea that was focused on developmental movement, over time evolved into a theory that offered a way to analyze movement which became known as Kestenberg Movement Profiles (KMP). Developed by Janet Kestenberg Amighi, who took her passion for development and dance/movement therapy and created a theory that offers itself as a unique research tool, assessment method, anchor for clinical intervention, and an approach to individual, interpersonal, and cultural differences (Amighi et al., 2018). Kestenberg looks at and breaks up movement through flow, effort, and shape. Kestenberg defined 10 tension flow rhythms that are built on each other dependent on development. These stages are predicted to appear within the first five to six years of life. Indulging rhythms are categorized as soothing and accommodating rhythms, whereas fighting rhythms are categorized as fighting and mobilizing rhythms (Koch et al., 2017). Each rhythm is linked to the understanding of drive phenomena and grounded in neuro-biophysiology of life. Although these rhythms develop within the first five to six years of life, humans utilize these rhythms in everyday functions. For example, chewing gum to concentrate, tapping the foot, jumping for excitement, and more. This theory can help dance/movement clients and therapists engage and explore in the development of movement.

This literature review aims to find a connection between the phylogenetic order of the autonomic nervous system as described by Polyvagal Theory and developmental tension flow rhythms as described in the Kestenberg Movement Profiles. The goal of the paper is to explore

possible ways of using indulging and fighting rhythms to help facilitate each phase of the autonomic nervous system.

Methods

To collect research articles and information on current topics two search engines were used, the Lesley University library database and Google Scholar. Along with using an advanced search engine to refine peer reviewed articles - articles were found through other literature reviews on related topics. Key words used to help search through the literature were trauma, movement, regulation, Polyvagal, Kestenberg Movement Profile, and Dance Movement Therapy. In the beginning the literature was focused on the clinical use of movement rhythms to aid in regulation. As the review developed, the focus started to switch and look at the breakdown of each system as a whole and its parts. Current books were found through previous readings, recommendations from professors and other professionals in the mental health field.

Literature Review

This literature review will discuss the topics of Polyvagal Theory, trauma, dance/movement therapy, Kestenberg Movement Profiles (KMP) and indulging/fighting rhythms. The order of the topics is laid out in a format where each section builds on another. The section starts with the most inward theory focusing on the nervous system and gradually expands ending with using rhythms with a group, or outwardly, to help evoke social connection and regulation. The aim of the paper will be explored by making connections on how the nervous system may operate during different events/times in an individuals life. The goal of the paper is shown in the clinical implications of both Polyvagl Theory and Kestenberg Movement Profiles. The theme of interconnectedness and mind-body connection will be explored throughout.

Polyvagal Theory

Polyvagal Theory was developed by Steven Porges in 1994. His work with Polyvagal Theory started with experiments around the autonomic nervous system. The human body is a complex system that involves multiple parts. A primitive part of the body is the nervous system. This system has many layers within it (as shown in table 1). First, the nervous system breaks down into subsystems, the central nervous system, and the peripheral nervous system. The central nervous system includes the brain and spinal cord. The peripheral nervous system includes all the other nerves and systems that are not connected to the brain and spinal cord. From here, the peripheral nervous system can be broken into two smaller subsystems: the somatic nervous system and the autonomic nervous system. The somatic nervous system includes muscles and nerves that carry information from the senses with the exclusion of sight, through the body to the brain. The autonomic nervous system connects the majority of the internal organs to the brain. The last subsystem happens in the autonomic nervous system. The autonomic nervous system consists of three divisions: the sympathetic nervous system, parasympathetic nervous system, enteric nervous system. The sympathetic nervous system oversees the fight or flight responses. The parasympathetic nervous system oversees the rest and digest process. The enteric nervous system oversees the process of digestion. Certain organs are controlled through the autonomic nervous system, these organs include: the eyes, nose, salivary gland, the skin, heart and circulatory system, immune system, lungs, intestines, colon, liver, pancreas, urinary tract, and the reproductive system. These subsystems work together to create our overall nervous system and work with the other parts of our body to facilitate movement and function.

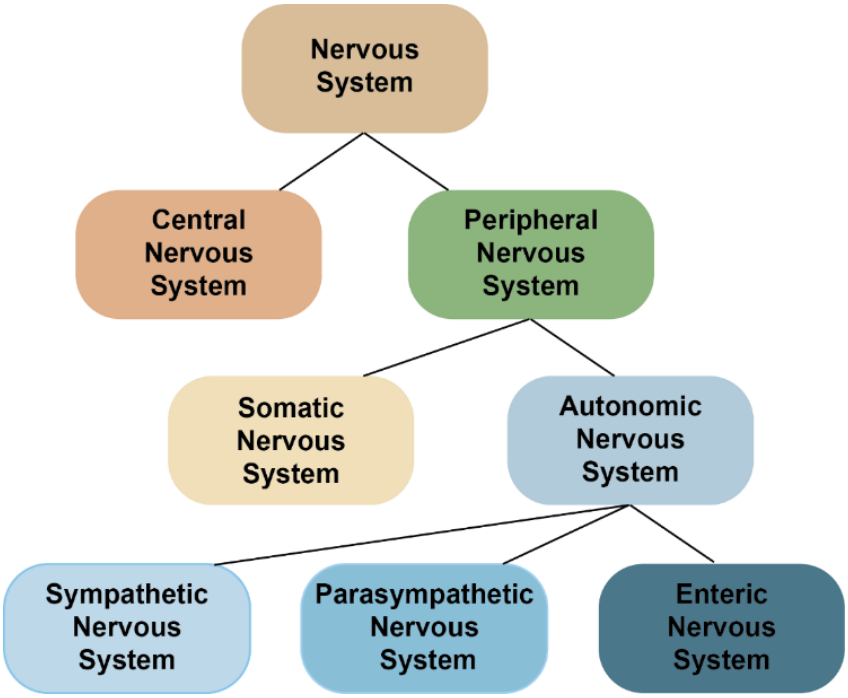

Table 1: A breakdown of the nervous system.

Table 1 shows how the autonomic nervous system is a part of a larger system. When all the systems are regulated, the whole body can function in the cycle of regulation that it is meant to operate under. When the autonomic nervous system becomes dysregulated, the body sends more energy and attention to the autonomic nervous system, this creates an imbalance and dysregulation throughout the whole body. With this knowledge in mind, Porges focused on the regulation of the heart because the regulation of the heart determines the availability of the metabolic resources required for mobilization as well as for growth and restoration (Porges 2001). This is important because it shows how one regulated or dysregulated part can impact the rest of the system. A vital part for regulation in the autonomic nervous system is the vagus nerve. The vagus nerve is the 10^{th} cranial nerve starting in the medulla oblongata, a part of the brain that

connects to the spinal cord and splits into multiple branches that extend down your neck to your vital organs (Web md). The vagus nerve helps your body exit the fight or flight state by activating the parasympathetic system and regulating body sensations such as muscle tension, blood pressure, heart rate. Porges noticed the importance of the vagus nerve and started to explore the connection of mental health and the physical changes that happen during shifts in regulation and safety (Porges 2001). This work continues to show the importance of helping clients regulate and maintain balance within their body.

Subsystems of the Vagal Nerve

Porges (2001) proposes that the mammalian nervous system is a product of evolution. The phylogenetic order of the mammalian nervous system includes the ventral vagal complex (VVC), the sympathetic nervous system, and the dorsal vagal complex (DVC). Each sub system serves important purposes such as maintaining survival and shaping how the individual interacts with the world.

Ventral Vagal Complex

The ventral vagal complex, which is also known as the social engagement system, is the most evolved layer of the autonomic nervous system. Porges (2001) states that in mammals the visceromotor fibers to the heart express high levels of tonic control and are capable of rapid shifts in cardioinhibitory tone to provide dynamic changes in metabolic output to match environmental challenges. Meaning, at this level the body can regulate its temperature, heart rate, and organs which creates space for safe connection to happen. This level is called the social engagement system because it focuses only on the regulation of the face, head and specific autonomic functions mediated by the myelinated vagus (Porges 2001). Collectively these muscles and autonomic functions regulate and facilitate social engagement and modulate the

sensory features of the environment. Dana (2020) states that in this state we feel grounded, organized, and ready to face the day. We move through the day with a sense of safety and successfully meet the ordinary challenges of life. During regulation the body can hold and process stress and move through the cycle of emotions. This is a state where the whole system is regulated and functioning in order.

Vagal Brake

Individuals can live in the ventral vagal complex for long periods of time due to what Porges calls the vagal brake (Porges, 2001). The vagal brake is a function of the myelinated vagus nerve where rapid inhibition and disinhibition of the vagal tone to the heart can rapidly mobilize or calm an individual (Porges 2001). This system is helpful in regulating the heartbeat which reflects and controls other organs and processes within the body. If the heart rate becomes too high due to stress, trauma, or any physical reason - the vagal brake acts as a response and forces the heart to slow down. The same thing happens in the reverse, if the heart is beating too slow the vagal brake promotes and forces the heart to speed up. The issue arises when the vagal brake is not appropriately reading and regulating the systems. The vagal brake can stop functioning for a variety of reasons; some theories include trauma disrupting the body's homeostasis (Guiles, 2019), and a diagnosis of depression (Field 2008). Porges (2001) states that if the vagal brake is not functioning or the survival needs of the organism are not being met, phylogenetically older systems will be recruited to regulate metabolic output to deal with environmental challenges. When the body determines the vagal brake is no longer enough this means that it cannot handle the amount of stress it is under and therefore cannot properly regulate. This is important information because if the body cannot regulate itself it starts to send signals to the brain stating that there is some form of danger, and it needs to protect itself. When

this happens the body switches from the ventral vagal complex operating the system to the sympathetic nervous system taking over.

Sympathetic Nervous System

In everyday function the sympathetic nervous system is used to help regulate the heart and breath rhythms and brings us energy to move throughout the day (Dana 2020). When the sympathetic nervous system is enabled due to a risk of threat, our senses and the brain start to notice any danger and prepare the body for survival. This stage is often known as the mobilization stage or fight or flight stage. Here the body starts to prepare for emergencies by increasing cardiac output, stimulating sweat glands to protect and lubricate the skin, and by inhibiting the metabolically costly gastrointestinal tract (Porges 2001). Appetite and sleep are decreased due to the decrease in the digestive system and an increase in adrenaline to fuel the body. When sleep and appetite are impacted the body has an even harder time regulating since the person may not be getting their basic needs met. During this stage social connections are not fully lost but there is a guarded nature to how the person and body interacts with their world. A body caught in a fight response may have a forward leaning posture and unrelenting muscular tension (Haines 2019, Cabeen 2024). The body is preparing to be on defense and offense at the same time. For some, a body in a flight response leans away from contact, ends relationships and engagements inexplicably abruptly, and only participates in social interactions that require little commitment and have multiple opportunities to exit (Haines, 2019, Cabeen 2024). As a clinician it can be beneficial to know how the client holds their body in a fight and flight state. The range of expression can vary across cultures and ways the body learned to interact with their surroundings. After a period of time the fight mode starts to wear out and flight can start to show

up. When the body is in a state of flight for too long it starts to prepare to operate on the lowest level of our nervous system, the dorsal vagal complex.

Dorsal Vagal Complex

The dorsal vagal complex is the last level in the phylogenetic stage. In everyday use the dorsal vagal complex aids in the regulation of digestion and brings nutrients to nourish us (Dana, 2020). When in the role of survival this stage is also known as the shut down or immobilization stage (Porges, 2001). The dorsal vagal complex provides the primary neural control of subdiaphragmatic visceral organs. It provides low tonic influences on the heart and bronchi. When entering this stage, the body goes into a state of hibernation. Slow breathing and movement are associated. Isolation is common in this stage due to the shutdown of the social engagement system, there is a tendency to collapse, disconnect, and disappear. The individual not only starts to disconnect with their outside world through social interactions, they also are at risk for beginning to lose connection with space and time. Dissociation, which is defined as a defensive mechanism in which conflicting impulses are kept apart or threatening ideas and feelings are separated from the rest of the psyche (APA, 2023), is experienced during this level of regulation. A body caught in a freeze state may experience considerable numbness, regularly find their minds going “blank” and will avoid social engagements that are overly stimulating (Haines 2019, Cabeen 2024). While in this phase individuals tend to experience hopelessness and the body begins to accept that survival via fighting will not work. Mixed states of hypo arousal and hyper arousal can also be seen while existing in this level. An example of this is an individual who has hypo arousal, having low energy and a lack of movement while also having hyper arousal in finding difficulty becoming settled and falling asleep at night.

Polyvagal Theory is based on the idea that stress and coping response strategies are hierarchically ordered according to a phylogenetic stage (Porges 1997, Porges 2001). Clinicians and clients can begin to gain insight into what body sensations, emotions and symptoms feel like while in the social connection (ventral), fight, or flight (sympathetic), or shut down (dorsal) zone. This can be important for clients to label where they are at and what coping skills/resources may be needed. Along with being able to label, the goal would be for clients to be able to use exercises to help move from a lower phylogenetic stage (sympathetic or dorsal) to a higher stage (ventral).

Limitations of Polyvagal Theory

Although Polyvagal Theory has come a long way and offers a unique way of looking at the nervous system there is room for improvement. More research on the integration of Polyvagal Theory into clinical implications should continue to be conducted. Rylan (2021) mentions how some of Polyvagal Theory's fundamental assumptions of how neurobiology impacts behavior is not proven and requires further empirical research to better establish these relationships.

Trauma

Polyvagal Theory opens a new perspective into understanding and treating clients with a history and diagnosis of Post Traumatic Stress Disorder (PTSD). The theory adds support and research to the idea that somatic experiences happen during trauma as well as after the trauma occurred. Trauma is defined in the American Psychology Association as any disturbing experience that results in significant fear, helplessness, dissociation, confusion, or other disruptive feelings intense enough to have a long-lasting negative effect on a person's attitudes, behavior, and other aspects of functioning. Traumatic events include those caused by human

behavior (e.g., rape, war, industrial accidents) as well as by nature (e.g., earthquakes) and often challenge an individual's view of the world as a just, safe, and predictable place (APA 2023). This definition excludes a crucial element, which is the somatic experiences that happen with trauma. A person might experience chronic neck and backaches from holding themselves rigidly controlled. Another person might experience a choking sensation in his throat when confronted with a conflict. A third person might feel nothing in their body because they are so completely removed from the underlying pain (McFarlane 2010). Trauma and its relationship to the body has become increasingly researched and discussed within the field of clinical psychology. (Dana, 2023; Levine 1997; Van Der Kolk, 2014

Trauma is thought to be stored and processed in the body. One reason for this thought is when trauma is experienced, it is stored in the implicit memory. For implicit memory, the information is heard, seen, and/or felt and is relayed from the thalamus, which is involved in sensory processing to the amygdala, in a process that is preconscious (Damis, 2022). Implicit memory formation and retrieval is an important skill in life for recalling familiar sights/sounds, to learn from mistakes, and unconscious body movement patterns such as walking and talking. Trauma makes it harder to treat because even when the event has ceased the body continues to re-experience the event coming back as images, behaviors, and physical sensations (Van Der Kolk 2023.) These images, behaviors, and physical sensations are proof that the body is trying to understand and process through the means of which it is stored, in the senses. Implicit memory relies heavily on the body (Damis, 2022).

Because trauma is processed through parts of the brain that are nonverbal and based on the sensory experience, the physical sensations of trauma can be re-experienced quite frequently. When the body processes images or emotions like the original event the person may have

preconscious emotional activation reminiscent of the experience without being aware of it. (Damis, 2022). In other words when a person who has experienced trauma witnesses or experiences a trigger that reminds their body of a previously dangerous situation, they may respond to the current moment with a distorted view, as if there was danger nearby. This can be a body reaction such as high heart rate and tense muscles or a thought process reaction such as feeling the loss of control. Nicabm (2019) states how trauma impacts all four levels of memory and behavior, for example, trauma can change emotional memories, resulting in a person who might experience painful emotions without context. The body, senses, and brain, notice a false sense of danger which can cause an increase in the survival regulation zones such as our sympathetic and dorsal vagal cortex to activate.

Movement Therapy and Trauma

Dance/movement therapy has been an approach to working with trauma since 1942 (Chace, 1993). Marian Chace was invited to work at St. Elizabeth's psychiatric hospital in Washington D.C. where she worked with veterans from World War ll. Marian Chace used dance as a means of communication and believed that tensions and distortions of the body are reflections of traumatic experience (ADTA 2020). Her work has inspired dance/movement therapists, somatic therapists, and health care professionals to explore how movement and embodiment can impact human experience across multiple diagnoses and populations.

Van Der Kolk (2023) stated that trauma work starts with one question, "how do we help people live in bodies that feel fundamentally safe?". Dance/movement therapy serves a unique purpose in trauma work because of its inherent focus on the body. By applying a bottom-up perspective of treatment, dance/movement therapy offers the client a place to begin to process and drop into the body without the need or use of words. In sessions, interventions and methods

for creating a felt sense of safety are explored through body movements, metaphors, and relational components.

External Safety

Before addressing safety in the body, safety within a space is important to establish because the body may not be a place that the client feels safe in yet. Since it is known that people who experience trauma are easily triggered into a state of survival, which creates states of hyper or hypo arousal, eliminating external senses of danger in the therapeutic space is crucial (Levine, 2019). Dance/movement therapists are aware that the physical space needs to resemble a place of safety for the client to be metaphorically and/or physically held. Acknowledging that each person has a different understanding and image of what a safe place looks and feels like to them, the therapist works with each client to transform the space with props and lighting. Through repetitive action of setting up the space the client can start to understand a felt sense of safety through outside stimuli (Levine, 2019). A client understanding and sensing safety can mean, in terms of Polyvagal Theory, that the body starts the process of being able to regulate itself and move back into the social connection system.

External safety of the physical space also includes the people within the space. The client must feel that the dance movement therapist is a safe person. Wilson (2015) states that psychological safety is important, which includes trust in the clinician and the associated ability to communicate extreme feelings and reactions. The person who has experienced trauma needs to feel a relational sense of safety with the therapist. The felt sense of safety allows the client to switch roles from protector of self to allowing the therapist to protect them for a brief period (Levine, 2019). This is important in all trauma work, however especially important in relational trauma where the person has been shown before that someone they thought was safe, ended up

hurting them. Dance/movement therapists build rapport with their clients through interventions such as kinesthetic empathy, mirroring, and attunement. The work of the therapist is to continually create a safe space. Through repetition, the client can start to feel and understand a sense of safety through the environment (Levine, 2019).

Internal Safety

Once a person feels safe enough within sessions the dance/movement therapist begins to switch from a focus of external stimuli to internal stimuli. Safety is viewed as the initial aim with traumatized patients, it is part of the process of helping the traumatized person to move from being haunted by the past and interpreting the subsequent emotionally arousing stimuli as a return of the trauma to being fully engaged in the present and becoming capable of responding to current exigencies (Wilson, 2015). Dance/movement therapists use interventions to reconnect with the body in small forms which starts to introduce a reconnection of mind and body. The goal in treatment is to help the individual feel their bodies again and to be aware of their experiences in their bodies (Levine, 2019). During this process individuals begin to open to the idea of ‘this is what happened to me’, and ‘this is what I am dealing with.’

Each session involves both fluidity and consistency, suggesting that there is a clear beginning, middle, and end to each session (Levine, 2019). The importance of having a balance between consistency and fluidity is the consistency ensures the patient knows that during each session there is a clear structure. The clear structure can help clients feel more comfortable and regulated by not having to predict what is going to happen. The structure and rituals are ways the client can return to a regulated nervous system if dropping into a lower system (sympathetic or dorsal) occurs. By approaching each beginning, middle, and end with fluidity it allows the therapist to meet the client where they are at and be more intentional with interventions. The

fluidity helps the client start to explore challenging topics such as triggers, trauma histories, body memories, and other topics that challenge the regulation of the body. The clinician should be an aid in helping the client identify feelings of regulation and practices on how to regulate.

Dance/movement therapists explore and embody many different interventions to treat different aspects of trauma. One aspect particular to childhood trauma is focusing and retraining the body with developmental movement. The earlier trauma starts, the more difficult it is to treat and the greater the damage is likely to be (Perry, 2017). When trauma is experienced young it impacts the natural development and thought formation of a child. The child develops behaviors that served them during the time and place when the trauma occurred, however as the child grows and the trauma is not as present, this coping skills behavior can become maladaptive. The behaviors can look like an overreaction to a situation and emotional dysregulation. In Porges (1996) study he found that infants who had difficultly decreasing vagal tone during a social attention task at nine months of age had significantly more behavior problems at three years old (Field, 2008). Without the education of what to try in place of survival patterns, the child can become stuck. Perry (2017) states how rhythm-keeping can be taught through music and movement classes, which can not only help a dysregulated brainstem to improve its control over important motor activities like walking, but also, is believed to strengthen its role in stress response system regulation. This is important because it reiterates the idea that stress response system regulation is possible and can be done through movement rhythms, ones that dance movement therapists explore each day.

Kestenberg Movement Profile

Kestenberg Movement Profiles is a specific dance movement therapy theory that focuses on developmental movement starting in utero. This theory is one used for analyzing movement

as well as engaging movement qualities. Clinically oriented Kestenberg Movement Profile analysts are interested in observing if any movement factors are employed inappropriately in a present situation (Amighi et al., 2018). This is helpful when the movement is showing the therapist/client is potentially reacting to cues not in the current situation but of the traumatic survival pattern that the brain has learned.

Janet Kestenberg Amighi is the creator of the Kestenberg Movement Profile. She developed her theory through her work with colleagues in the Sands Points Movement Study group who observed infant movement with the goal of discovering if there were movement patterns that correlated with the stages of child development as originally proposed by Freud (Amighi 1905, 2018.) Kestenberg and her team hypothesized that rhythms are fundamental ingredients of developmental phases. The theory has evolved and is used widely in the early childcare field (Amighi et al., 2018). Her work with developmental rhythms has set a path for helping understand children's movement and the needs that they serve.

Developmental movement is based in rhythm since verbal language is new and evolving still. Every day there is rhythm all around for individuals to take in and explore. Developmental movement starts with neural circuits called central pattern generators, that oscillate or vibrate at different speeds signalizing rhythmic motor output that generate breathing, chewing, swallowing, locomotion, and other rhythmic actions (Amighi et al., 2018). These rhythms start to evolve once the child starts interacting with outside environmental conditions. Being able to attune and regulate to another person's heartbeat is one of the first most fundamental movement rhythms a child will learn. The lower and most central regions of the brain respond to rhythm and touch: the brainstem's regulatory center controls heartbeat, the rise and fall of neurochemicals and hormones in the cycle of day and night, the beat of one's walk, and other patterns that must

maintain a rhythmic order to function properly (Perry, 2017). What this means is that during early development when the lowest part of the brain is developing the body's job is to learn how to regulate through rhythms. This also means that when abuse, neglect, or trauma happens during this developmental phase the rhythm of the whole nervous system is developed on a stress response. This is important especially through the lenses of Polyvagal since if the body is building new movements and continuously evolving with a baseline of dysregulation - it can weaken the vagal brake and increase what our internal homeostasis looks like. To help a person who has developmental trauma or experiences this low vagal tone at a young age, therapies that go back and try to correct the developmental movement that caused the dysregulation can be seen as helpful. Perry (2017) mentions a client he worked with who experienced developmental trauma and the most effective therapy for them was to sit on someone's lap, be held and rocked.

The Kestenberg Movement Profile system outlines a developmental line of movement patterns which assumes that early defensive patterns and executive functions in movement arise from the sensorimotor patterns (Kormos, 2020). Dance/movement therapists explore developmental movement patterns in children and have begun to expand into other age ranges.

Kestenberg Movement Profiles breaks movement down into multiple characteristics such as flow, shape, direction, and effort. Tension flow rhythms are developmental rhythms that are correlated to Freud's five developmental phases: oral, anal, urethral, inner-genital and outer-genital. Each rhythm is described by characteristic, motivational, relational, cognitive, and movement features. Kestenberg states that with each phase there are two elements, an indulging and fighting rhythm. In the first half of a developmental phase the indulging rhythm is predominant and in the second half the fighting rhythms become more dominant. Each rhythm helps to promote development, the indulging rhythm helps to soothe the system while change is

being introduced and the fighting rhythms begin to energize the body and system to take the risk of growing and trying new things. Paying attention to how new rhythms and movement arise brings insight into behavior and how someone interacts with their inner and outer world. With clients who have experienced trauma, the behavior may not be appropriate to the situation, and this is due to an unregulated and triggered trauma response. Learning what movements a client identifies as distressing and safe can be a great insight as to help them regulate their nervous system back to a ventral vagal state.

Stage 1: Sucking

The first stage of development is the oral stage which starts in utero and heightens in frequency during the first six months of life. This tension flow rhythm is the sucking rhythm, which is identified as a smooth alternation between free flow and bound flow (Amighi et al, 2018) (see table 2). The sucking rhythm is classified as a soothing rhythm which means that this rhythm helps facilitate a state of calmness. Sucking promotes self-soothing, aids exploration, and the formation of connections (Amighi et al., 2018). The sucking rhythm can be found mainly in the mouth but extends to the hands and arms as well. In adults, oral rhythms are used throughout the body reflecting and reinforcing the urge to take-in, incorporate, and find succor (Amghi et al., 2018). The characteristics of sucking rhythms inform how an adult may interact with their outside world. Amighi et al. (2018) states we have found that individuals with a relatively high predominance of sucking rhythms tend to particularly enjoy taking in not only food but also knowledge, new sights, sensations, and experiences with the openness of a beginner mind. Lastly individuals who engage in sucking rhythms find enjoyment in oral self-soothing practices such as singing or talking. This stage is important because it is the base that all other developmental rhythms grow from.

Stage 1: Snapping/Biting

The second tension flow rhythm which still takes place during the oral stage of development is snapping/biting. Snapping/biting becomes more prominent around 7 months of age or when a child begins teething. This rhythm is described like the sucking rhythm swapping between free flow and bound flow; however, the transitions are sharp as it reverses direction in flow (See table 2). Snapping/biting rhythm is classified as a fighting rhythm which means this rhythm is used to mobilize the system. The short evenly held proportion of the biting rhythm can serve briefly held attentiveness as well as an early foundation for sustained attention and concentration (Amighi et al., 2018). The formation of sustained attention and concentration is a skill that is worked on throughout life. This is why some people bite on the pen or have a snack when they try to concentrate. Amighi et al. (2018) mentions that snapping/biting rhythms are also forms of exploration, ways of feeling the hardness or softness of things and discovering their qualities when they are broken into pieces. Other movements that fall into the snapping/biting category include clapping, pinching, pulling hair, patting, and poking. Along with physical exploration the snapping/biting rhythm starts to define the body more clearly as self and encourages more distinct body boundaries. An adult who engages in an abundance of snapping/biting rhythms may be eager to take in knowledge and experiences but tends to respond to them in critically thoughtful ways (Amighi et al., 2018). It is seen that the sucking rhythm from the previous stage is still present by providing the want for exploration, the snapping/biting rhythm develops and brings structure to the purpose. Something important to note is when infants or adults use exaggerated amounts of biting rhythms, they may be expressing unresolved unconscious or conscious issues through motor discharges that become self-injurious (Amighi et al., 2018). Examples of this include head banging, self-cutting, nail biting, picking at the skin,

and pulling out one's own hair. This is important because it reiterates that the person is engaging in self-injurious behaviors for a purpose. (Hoorn, 2020) hypothesizes the possibility that non suicidal self-injury may increase vagal tone and parasympathetic tone, which in turn may be linked to a more regulated emotional state. More research needs to be explored for this connection between non suicidal self-injury and regulation. However, it continues to add to the idea that self-harm may have addictive qualities along with serving a need to the client.

Stage 2: Twisting

The second phase of development is the anal phase which typically starts around the second year of life. The indulging tension flow rhythm that shows up is called the twisting rhythm. This rhythm is identified as twists with slight adjustments in muscle tension (see table 2). Movements using the twisting rhythm include crawling, spinal rotations that spread throughout the body, rolling over, changing from one position to another, shifting attention, and smiling coyly (Amghi et al., 2018). These movements offer joy, playfulness and continue the separation of self from child and caregiver. An adult who engages in twisting rhythms are often associated with a humorous outlook, teasing, being a jokester, flirtatiousness, and charm. (Amighi et al., 2018). In yoga the twisting of the lower spine is believed to release toxins trapped in the body (Chia, 2011). This form of indulging rhythm presents calmness in a different way than sucking rhythms. Here the calmness of the system allows for the social engagement system in the autonomic nervous system to be active. However, an abundance of twisting can also lead to being restless, prone to boredom with a consistent routine, seeking change and variety (Amighi et al., 2018). This is why a balance between indulging and fighting rhythms can be important.

Stage 2: Strain/release

The fighting rhythm described in the anal phase of development is called the strain/release rhythm which starts to develop around eighteen months of age. This rhythm starts with an abrupt increase to high intensity bound flow muscle tension that is held steadily during the push and then abruptly releases (Amighi et al., 2018) (see table 2). There are two separate segments that happen together within this phase, the strain/hold, and the release. Both serve a purpose to each other and the development patterns before it. The strain/hold segment of the rhythm contributes to the development of clearly defined, organized, and structured behaviors, children in this phase tend to find comfort in orderliness and structure (Amighi et al., 2018). This is where the balance of the indulging and fighting rhythm is shown. The twisting rhythm wants to create flexibility while strain/release creates order within the flexibility. The release portion of the rhythm proves a foundation for letting go. When children practice exercising their control by holding fast, they need to find a way to release the held energy or simply let go (Amighi et al., 2018). Because strain/release is classified as a fighting rhythm the letting go piece is extremely important. If not, the body continues to hold and hold and stores the mobilizing energy for when it is needed. If the release does not happen then more assertive and aggressive behaviors may become apparent. An adult who encounters strain/release rhythms are often neat, well organized, controlled, and sometimes rigid and controlling (Amighi et al., 2018.) The need for structure becomes apparent in the skills listed for people who engage in strain/release, which can be helpful information for clients who need structure but cannot label it yet. Throughout a lifetime, clients who strain without release expose themselves to stress and body tension. On the other hand, when the release portion of the rhythm is overly developed, there is proneness to sudden temper tantrums, throwing objects, and releasing strong feelings and insults abruptly (Amighi et

al., 2018). Letting go can be especially hard for people who have nonsecure attachment styles. It is something to help guide clients through the idea of how to healthy let go in the body and in real life situations.

Stage 3: Running/drifting

The third phase of development is the urethral phase which is seen throughout the third year of life. The indulging tension flow rhythm that emerges here is running/drifting, which normally begins around the start of three years. This flow is described as very gradual increases or decreases of muscle tension of low levels of intensity (Amighi et al., 2018) (see table 2). The running/drifting rhythm is shown in the body as more fluid movements – having some self-identification but lacking the surrounding world boundaries. The running/drifting child needs help with boundaries, help to keep from spilling and falling, needs comfort when spilling tears, and help with controlling the free flow of motor impulses (Amighi et al., 2018). The child begins to explore separation from caregiver while also seeking comfort when the system becomes overwhelmed. This type of distance and stress tolerance exercise starts to strengthen the vagal brake talked about earlier. Having a strengthened vagal brake allows individuals to be able to handle and appropriately regulate under stress. An adult who engages in running/drifting tends to prefer moving or thinking at their own pace in an unstructured fashion and be absent-minded, seemingly in their own world. This form of indulging as seen through calmness goes back to the self-soothing calmness in the sucking rhythm. It offers the system calmness through its free-flowing movement and thinking. When an individual has an abundance of running/drifting rhythms they may lack good personal boundaries, running on in conversations talking on without end, without seeming to engage the other (Amighi et al., 2018). As seen in the other rhythms this

indulging rhythm needs a fighting rhythm to come in and form some structure of the movement to evolve.

Stage 3: Starting/stopping

The fighting rhythm in the urethral phase of development is labeled the starting/stopping rhythm. This rhythm is described similar to running/drifting but with more sharp transitions. Here children start to find joy in exploring the idea of stop and go. They start to learn to bulge forward in the chest to initiate running, then hollow back in the pelvis to stop (Amighi et al., 2018). This action and awareness begins to bring back self-realization and body awareness. Adults who engage in starting/stopping rhythms tend to be doers who are often goal oriented, habitually on time, ambitious, and competitive (Amighi et al., 2018). In cultures such as America, engaging in starting/stopping is highly valued due to the individualistic business model of the country. However as seen when engaged in the rhythm for too long, it creates burn out, and normally moves from one task to the next without completion (Amighi et al., 2018). Mobilization is apparent in this phase as the body is trying to continually create order and become goal oriented.

Stage 4: Swaying

The fourth developmental phase is the inner-genital phase which starts around age four. The indulging rhythm in this phase is a swaying rhythm. The rhythm is described as low intensity, wave-like contractions of gradually increasing and decreasing muscle tension (Amighi et al., 2018) (see table 2). Movements in children seen in this phase are dancing with flowing movement and twirls, gently rocking toys, telling stories with a singing tone, integrating oneself into stories, and drawing long wavy lines. In this phase the swaying rhythm acts as self-soothing for the current moment. It also provides an integration of various impulses, distresses, and needs

that accumulate in the first three years of life (Amighi et al., 2018). The swaying rhythm acts as a way for the body to integrate and understand the development already learned. In adults, someone who engages in the swaying rhythm supports a convergent style of problem solving, the ability to integrate diverse ideas, and to potentially unite people with conflicting views (Amighi et al., 2018). Just as the swaying rhythm allows the body to integrate the previous developmental rhythms, it also acts that way in the external world – creating social connections and fostering intimate relationships.

Stage 4: Surging/birthing

The fighting rhythm associated with this developmental stage is surging/birthing. The rhythm is described as gradually building to levels of high intensity in bound flow and then gradually releases to high levels of free flow and back again (Amighi et al., 2018) (see table 2) According to Kestenberg, this rhythm is not fully seen in children other than a short form of sharp stomach aches, bulging in between a care givers leg or hiding and bursting out of forts. In adults however the surging/birthing rhythm can be involved in emotional expression such as falling gradually, deeply, and passionately in love, spiritual beliefs, and feelings, and in the deeply passionate but subsiding pain of loss of loved ones and the grief process (Amighi et al., 2018). The idea with mobilization in this phase is that the rhythm is giving longer attention and energy towards a project, person, or idea. The most common place surging and birthing is seen is in the mother who is in active labor delivering their child.

Stage 5: Jumping

The last developmental phase is the outer-genital phase. The indulging tension flow rhythm here is the jumping rhythm. This rhythm becomes more conscious around the end of the

fourth year of life. This rhythm is described as having smooth transitions, facilitating bouncing easily from extreme levels of released, then controlled, muscular tension (Amighi, et al., 2018) (see table 2). This phase is associated with exploration of space and emotions. The abruptness of the rhythm accentuates bursts of feelings and rapid changes (Amighi et al., 2018). This reaction to abruptness shows the importance of all the developmental rhythms before this one because when the child reacts due to rapid changes the hope is to be guided by self-soothing rhythms that are already developed. An adult who engages in jumping rhythms are outgoing, energetic, and like to show off (Amighi et al., 2018) This rhythm is like the twisting rhythm where the sense of calmness is shown through the social engagement system being open and having a connection with others.

Stage 5: Spurting/ramming

The fighting rhythm equivalent to jumping is spurting/ramming, which kids start to tap into around their fifth birthday. This rhythm is described as jumping rhythms however the movement becomes less bouncy and more defined by sharp transitions (Amighi et al., 2018) (see table 2). In this rhythm the child is engaging with the world with a much more cognitively aware brain and more control over their whole body. The spurting/ramming rhythm gives a child's movement decisiveness, assertiveness, and clarity (Amighi et al., 2018). The child is continually exploring social and physical boundaries while creating structures in their inside and outside worlds. An adult who tends to use spurting/ramming rhythms may pursue a goal in a highly motivated fashion, hammering away at a task until it is completed (Amighi et al., 2018). Here the mobilization of the rhythm is used in extreme to get a task done. Examples of appropriate spurting/ramming rhythms include karate chops, a drummer's hitting a cymbal, stage actors exaggerating their gestures, football players tackling, and athletes running to a teammate and

chest bumping. If spurting/ramming rhythms are used without sufficient self-regulation, the rhythm can be associated with individuals who get dangerously out of control (Amighi et al., 2018). This is why the building of self-regulation is so important, for the safety of the individual and those around them.

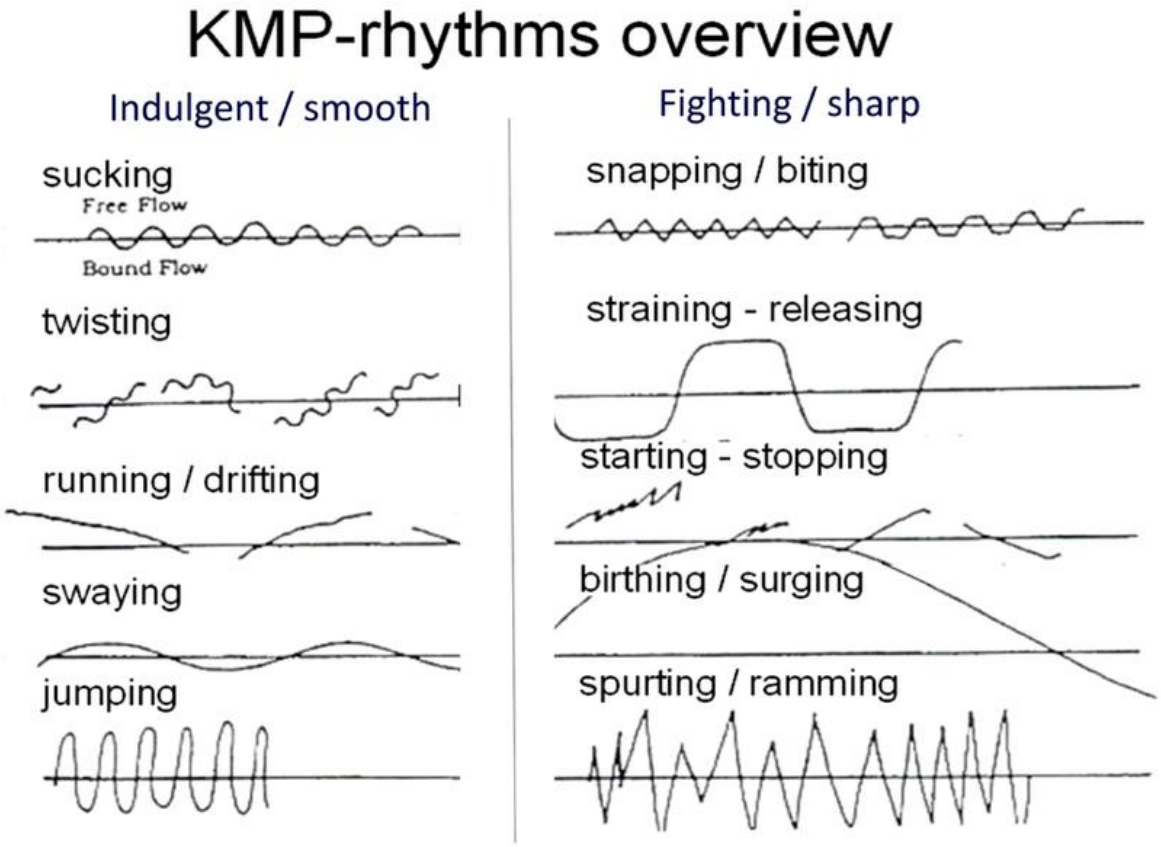

Table 2: Kestenberg tension flow rhythms scripture (Amighi et al., 2018)

Knowing how each of the rhythms appear and what function they are serving to the individual is a key element to treatment. A pattern that is seen between each developmental stage is the need for balance (Amighi et al., 2018). Too much of a calming indulging rhythm and the person can present in too much flow and openness which can put the client at risk. Too much mobilizing fighting rhythms and the system cannot regulate itself causing the stress signals of the

brain to turn on. The use of rhythms in treatment can be impactful by noticing, naming, and moving with the opposite rhythm.

Clinical implications of developmental movement

When working with children, teens and adults who have experienced childhood trauma, especially in the form of abuse/neglect, paying attention to rhythms can be beneficial for treatment. There are pure, well differentiated, and mixed rhythms, from the distribution of mixed rhythms a clinician can judge whether there is a fixation in each drive constellation (Grahm, 1992). Once the identification of the given drive is identified, the clinician can begin the work of unsticking the rhythm in the body. A person needs repetitive experiences appropriate to their developmental needs, needs that reflect the age at which they missed important stimuli or had been traumatized, not their chronological age (Perry, 2017). For example, if a child had experienced neglect or some form of trauma during the running/drifting phase where the child starts to explore a differentiation from caregiver and self but still relies on the caregiver to regulate and assist them, the child is not going to properly develop a sense of safety, attachment, and learn how running/drifting movements serve them. By meeting the child where they are at in the soothing rhythm stage, The clinician will open a nonverbal conversation of calm allowing the movement to move through into regulation. Movements such as rocking, swinging, nonnutritive sucking and breathing with slow exhalations can help promote calm states by enhancing the impact of the myelinated vagus on the heart (Pogres 2011, Stafter & Braungart 1995, Betty 2013). To help an individual unstick their body rhythms from the past, the clinician must guide the client through the phase that was lost at time of trauma. Through swaying rhythms, the body can begin to integrate that movement lesson into its repertoire.

Limitations of Kestenberg Movement Profiles

Kestenberg Movement Profiles is a technique that has helped many in developmental and long-term care. A limitation of working with Kestenberg Movement Profiles is that the dance movement therapist holds the power to assign meaning to movement. Caldwell (2013) refers to the power differential within assigning meaning to movement and invites the dance movement therapists to ask their clients what the movement means to them. This is a great approach for clients who have verbal/written capabilities and enough higher order thinking to process the meaning. More research needs to be done to see the impacts of excessive and minimal usage of developmental movement.

Indulging VS Fighting rhythms

Despite the criticisms, KMP rhythms are an important clinical tool for childhood development and trauma work. The use of rhythms has expanded and influenced clinical work with other populations as well. With the knowledge that indulging rhythms have a calming/soothing effect and fighting rhythms have a mobilizing effect to the system, the clinician can begin to explore movements that aid in up or down regulation. This can be an effective addition to treatment when working with populations who are engaging in rhythms that are not in balance. The indulging and fighting rhythms are developed to help regulate the system through change. When one rhythm is being used more than another there can be negative outcomes. Examining how rhythm's work can impact different populations and diagnoses is a critical next step.

The mobilization of fighting rhythms can be beneficial for diagnoses or people who are experiencing hypo arousal and existing in the lower levels of the autonomic nervous system. A common diagnosis that is described by these traits is depression. Symptoms of depression

include depressed mood most of the day, nearly every day, diminished interest, or pleasure in all or most of all activities, significant weight loss, insomnia, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness, diminished ability to concentrate, and recurrent thoughts of death (APA 2022). A prediction can be that clients who are in a depressive episode engage more in indulging rhythms because of the lack of structure and action in their body and daily routine. By engaging clients with a depressed mood in a form of fighting rhythms – the body may start to mobilize even if it is short term. Koch (2007) found that engaging clients with a diagnosis of depression in a dance movement therapy group that had the main movement be jumping rhythms would yield a decrease in isolative depressive symptoms. This was achieved through a warmup circle dance from Israel called Hava Nagila – "let us have joy" and followed with themes of jumping rhythms in different body parts. By engaging in a fighting rhythm that is supposed to energize the body the clients were able to notice a shift in their overall mood.

On the other hand, indulging rhythms can be beneficial in the treatment for people who have diagnoses that are characterized by hyperarousal. Manic episodes in bipolar disorder are a form of hyper arousal. Symptoms of mania include a distinct period of abnormally and persistently elevated, expansive, or irritable mood and abnormally and persistently increased activity or energy, inflated self-esteem, decreased need for sleep, more talkative than usual or pressure to keep talking, flight of ideas or subjective experience that thoughts are racing, distractibility, increase in goal-directed activity, excessive involvement in activities that have a high potential for painful consequences. This diagnosis and the qualifying symptoms show there is an abundance of fighting rhythms through the excess need to perform, the high intensity of goals, and social interactions. Betty (2013) found that working with children and teens who are experiencing high levels of emotion dysregulation, matching their intensity with the soothing

rhythm of equal phase can be helpful. Although the soothing rhythm itself may start off in a higher tempo it can gradually be moved into a slower tempo facilitating regulation through the nervous system.

Depression and mania are just two examples of how rhythms show up in symptomology and treatment. In patients with borderline personality disorder an approach with movements with sharp rhythms may cause more positive affect when they are in a state where self-harm is the goal or a means of relief (Koch 2014). As stated, an abundance of the twisting rhythm can lead to thoughts of self-harm, so engaging the client in more strain and release movements may be beneficial to help manage. On the contrary, a patient with obsessive compulsive disorder may benefit from smooth movement patterns to overcome compulsive approach actions (Koch 2014). Compulsions are the fighting rhythms means to activate and mobilize on intrusive thoughts. These examples provide a variety of ways that rhythms can be helpful in identification of symptoms, diagnosis, and treatment.

Even outside of clinical settings indulging and fighting rhythms are all around us. How we handle objects in space, interact with others, and nonverbal cues used for interactions with others are all forms of rhythms in use. During a simple embrace from a friend, loved one, or even a stranger we unconsciously use cues from the indulging and fighting rhythms. Separation is facilitated by movement qualities with sharp transitions and indulgence is facilitated by movements qualities with smooth transitions (Koch, 2016). What Koch means is that while in a hug or any embrace with physical touch the unconscious knows to let go through small but sharp fighting rhythms. The embrace is held longer and initiated when soothing rhythms are held.

Being mindful of how indulging and fighting rhythms show up is important. These rhythms can show up in big and small movements every day. The biting rhythm, for example,

can be used when focusing on a situation – which is why it is common for some to bite on their pen caps when they are trying to focus. The swaying movement can be used to help regulate in situations of high and low distress. These movements can be useful for both patients and clinicians to notice but also to notice in the clinician role as well. Rhythms can be used as small self-settling practices when working with clients. Using rhythms to coregulate with a client is an excellent way of exploring why their rhythms show up and how to move through them together.

Concluding Remarks

This literature review started by exploring the Polyvagal Theory and evolution of the autonomic nervous system. Polyvagal Theory provided information on how the autonomic nervous system operates, the levels of regulation, and possible behaviors seen within each stage. Dance/movement therapy techniques such as Kestenberg Movement Profiles were further discussed as well. The progression of developmental movement was explored and how developmental movement can play a role in adult lives. The literature showed places where possible connections between the autonomic nervous system and development movement coincided. The next step of the paper was to take the connections made and move into the clinical practice. The research started to show how using indulging/fighting rhythms could help regulate the autonomic nervous system and bring clients back into their window of tolerance. Throughout the literature review trauma informed considerations and limitations were discussed.

Discussion

Findings

The aim of this literature review was to find a connection between the phylogenetic order of the autonomic nervous system as described by Polyvagal Theory and developmental tension flow rhythms as described in the Kestenberg Movement Profiles. Both theories share similar structure style such as having levels that develop on top of the existing one, each level is not fully separated and will sometimes show up in mixed states, and both can be impacted by trauma. The findings show a connection between the autonomic nervous system and developmental movement through the range of movement a client may have access to while in different regulated levels of the nervous system. For example, when an individual is in the dorsal vagal stage of dysregulation, movement may be limited and more internal. This small, more inward movement can mimic the sucking and other lower developmental rhythms. The movements are based on survival and self-soothing which is what the nervous system is focused on accomplishing in this level. As the individual moves their nervous system into a regulated state the range of movements tends to increase and become more developed, expanding toward social connection.

The goal of the paper was to explore possible ways of using indulging and fighting rhythms to help facilitate each phase of the autonomic nervous system. The review of literature suggests that using different rhythms such as indulging and fighting in clinical settings can possibly help aid regulation and decrease negative symptoms in an array of populations/diagnosis. Working with clients to label what their body feels/looks like and what behaviors tend to show up in different levels of regulation can be impactful in multiple ways. One of the ways it can be impactful is when clients have access to the body knowledge, they may

be able to catch dysregulation before going into a state of fight or flight or dorsal shut down. When the client is unable to access the body knowledge due to trauma, clinicians can work with clients to start to explore what rhythms feel familiar and unfamiliar in their bodies and possibly why. Along with being able to identify rhythms, being able to employ the opposite rhythm to create balance may become important. This can look like using coping skills such as running (stage 3; running/drifting), picking glue (stage 2; biting), and playing the drum (stage 5; spurting/ramming) which are all fighting rhythms to help feel more energized or to displace the energy getting stuck in the body. It can also look like using coping skills such as rocking (stage 4; swaying), drinking water (Stage 1; drinking water), or moving with ribbons (stage 2; twisting) which are all indulging rhythms to help calm and soothe the over working and on guard system. By being able to help clients identify what coping skill is going to work during different levels of nervous system regulation it creates more space for the client to become independent and fully understand what being regulated can feel like.

A consideration that is important to note with all the findings is how trauma can impact the results. As clinicians having a trauma informed lens and approaching each behavior/situation/emotion with curiosity is critical to keep bias and judgements out of the therapeutic space. This includes not placing labels on what the movements observed are and instead having a dialogue with the client to have them label the movement. Trauma is a diagnosis that impacts multiple areas of the individual's life. The trauma and hardships of life may not stop but the practice of regulation may make life a bit easier to handle for the individual.

Future Research

While finding research articles on these topics it was easier to find information on the topics separately but finding them examined together was found to be difficult. There is new and forming research being done with the involvement of KMP amongst different populations, including trauma. Although the only current information that Kestenberg has with tension flow rhythms and trauma is mainly working with survivors of the holocaust and the one chapter on developmental trauma in her book. Future research should focus on Kestenberg developmental movement and how to help use the rhythms in the treatment of trauma.

The other connection that should be examined further is how using fighting and indulging systems physically impacts the autonomic nervous system with a Polyvagal lens. It has been shown through Koch (2007;2014) studies that the use of these rhythms can help decrease/increase symptoms in diagnosis such as depression and borderline personality disorder. Future research could aim to further the existing studies along with how rhythm work could influence other populations and settings.

In conclusion, it is evident that movement rhythms have significant implications for nervous system regulation. Through the literature on Polyvagal Theory, dance/movement therapy, Kestenberg Movement Profiles, and indulging/fighting rhythms it becomes clear that regulation of the nervous system can be shown and moved through movement and embodiment practices. This analysis highlights the importance of helping clients identify body states and increase nervous system regulation. Moving forward, it is crucial to continue to explore the mind body connection and an individual's own rhythmic patterns to reconnect to their inner and external worlds. Ultimately helping clients, especially those with trauma learn how to regulate

their nervous system and manage everyday stressors can positively impact the continuation of treatment, decrease diagnostic symptoms, and increase social interaction; all of which hopefully leads to people who get to live in bodies that feel fundamentally safe.

References

About. (n.d.). Www.adta.org. https://www.adta.org/about

Adler, J. (2009). Dance therapy and authentic movement : Looking for me, still looking. Expressive Media.

American Psychological Association. (2023). *APA Dictionary of Psychology*. APA Dictionary of Psychology. https://dictionary.apa.org/

American Psychiatric Association. (2022). *Diagnostic and statistical manual of mental disorders, text revision* (5th ed.). American Psychiatric Association.

Big Think. (2023, November 22). *How the body keeps the score on trauma | Bessel van der Kolk for Big Think+*. Www.youtube.com. https://www.youtube.com/watch?v=iTefkqYQz8g

Bonnie Bainbridge Cohen. (2018). *Basic neurocellular patterns : exploring developmental movement*. Burchfield Rose Publishers.

Cabeen, C. (2023). Trauma Responses in Social Choreography: Accessing Agency and Opportunities for Healing through Mindful Embodiment. *Arts*, *13*(1), 4–4. https://doi.org/10.3390/arts13010004

Caldwell, C. (2013). Diversity Issues in Movement Observation and Assessment. *American Journal of Dance Therapy*, *35*(2), 183–200. https://doi.org/10.1007/s10465-013-9159-9

Chia, M. (2011). *Karsai Nei Tsang*. Simon and Schuster.

Dana, D. A., & Dana, D. (2020). *Polyvagal Exercises for Safety and Connection: 50 Client-Centered Practices (Norton Series on Interpersonal Neurobiology)*. W. W. Norton & Company.

Damis, L. F. (2022). The Role of Implicit Memory in the Development and Recovery from Trauma-Related Disorders. *NeuroSci*, *3*(1), 63–88. https://doi.org/10.3390/neurosci3010005

Field, T., & Diego, M. (2008). Vagal activity, early growth and emotional development. *Infant Behavior and Development*, *31*(3), 361–373. https://doi.org/10.1016/j.infbeh.2007.12.008

Follow Your Own Rhythm - Personal and spiritual growth. (n.d.). Follow Your Own Rhythm. https://www.followyourownrhythm.com/

Guiles, R. A. F. (2019). *Psychophysiological Markers of Trauma: Investigating the Absence of Vagal Brake in Veterans with a History of Interpersonal Trauma* (Order No. 13427683). Available from ProQuest Central;

ProQuest Dissertations & Theses Global. (2179116588).https://ezproxyles.flo.org/login?url=https://www.proquest.com/dissertations-theses/psychophysiological-markers-trauma-investigating/docview/2179116588/se-2

Graham, S., Harris, K. R., & Reid, R. (1992). Developing Self-Regulated Learners. *Focus on Exceptional Children*, *24*(6). https://doi.org/10.17161/foec.v24i6.7539

Janet Kestenberg Amighi, Loman, S., & K Mark Sossin. (2018). *The meaning of movement : embodied developmental, clinical, and cultural perspectives of the Kestenberg Movement Profile*. Routledge.

Johnstone, L., & Boyle, M. (2018). The Power Threat Meaning Framework: An alternative nondiagnostic conceptual system. *Journal of Humanistic Psychology*, *1*(18). https://doi.org/10.1177/0022167818793289

Koch, S. C., & Rautner, H. (2017). Psychology of the Embrace: How Body Rhythms Communicate the Need to Indulge or Separate. *Behavioral Sciences (2076-328X)*, *7*(4), 80. https://doi-org.ezproxyles.flo.org/10.3390/bs7040080

Koch, Sabine C. "Rhythm is it: Effects of dynamic body feedback on affect and attitudes." Frontiers in Psychology, vol. 5, 2014, https://doi.org/10.3389/fpsyg.2014.00537.

Koch, Sabine C., et al. "The joy dance." The Arts in Psychotherapy, vol. 34, no. 4, Jan. 2007, pp. 340–349, https://doi.org/10.1016/j.aip.2007.07.001.

Levine, B., Land, H. M., & Lizano, E. L. (2019). Exploring Dance/Movement Therapy to Treat Women with Posttraumatic Stress Disorder. *Critical Social Work*, *16*(1). https://doi.org/10.22329/csw.v16i1.5915

Levine, P. A. (1997). *Waking the tiger: Healing trauma: The innate capacity to transform overwhelming experiences*. North Atlantic Books.

Maté, G. (2019). *When the body says no*. Vermillion.

McFarlane AC. The long-term costs of traumatic stress: intertwined physical and psychological consequences. World Psychiatry. 2010 Feb;9(1):3-10. doi: 10.1002/j.2051-5545.2010.tb00254.x. PMID: 20148146; PMCID: PMC2816923.

Menakem, R. (2021). *My grandmother's hands: Racialized trauma and the pathway to mending our hearts and Bodies*. Penguin Books.

Mickey Hart Quotes. (n.d.). BrainyQuote.com. Retrieved April 15, 2024, from BrainyQuote.com Web site: https://www.brainyquote.com/quotes/mickey_hart_187008

Understanding Trauma's Impact on Four Types of Memory [Infographic]. (2019, May 3). NICABM. https://www.nicabm.com/trauma-how-trauma-can-impact-memory-infographic/

Ortner, N. (2014). *The tapping solution: A revolutionary system for stress-free living*. Hay House.

Perry, B., & Szalavitz, M. (2017). *The boy who was raised as a dog : and other stories from a child psychiatrist's notebook : what traumatized children can teach us about loss, love, and healing*. Basic Books. (Original work published 2006)

Porges, S. W. (2001). The polyvagal theory: Phylogenetic substrates of a social nervous system. *International Journal of Psychophysiology*, *42*(2), 123–146. https://doi.org/10.1016/s0167-8760(01)00162-3

Ryland, S., Johnson, L. N., & Bernards, J. C. (2021). Honoring Protective Responses: Reframing Resistance in Therapy Using Polyvagal Theory. *Contemporary Family Therapy*, *44*. https://doi.org/10.1007/s10591-021-09584-8

Tortora, S. Ways of Seeing: An Early Childhood Integrated Therapeutic Approach for Parents and Babies. *Clin Soc Work J* 38, 37–50 (2010). https://doi.org/10.1007/s10615-009-0254-9

Van der Kolk, B. (2014). *The body keeps the score: Brain, mind, and body in the healing of trauma*. Penguin Books.

van Hoorn, A. C. (2020). Could affect regulation via vagal nerve self- stimulation be a maintaining factor in non-suicidal self-harm? *Medical Hypotheses*, *136*, 109498. https://doi.org/10.1016/j.mehy.2019.109498

Wilson, J. P., & DrožđekB. (2015). *Broken spirits : the treatment of traumatized asylum seekers, refugees, war, and torture victims*. Routledge, An Imprint Of The Taylor & Francis Group.

THESIS APPROVAL FORM

Lesley University
Graduate School of Arts & Social Sciences
Expressive Therapies Division
Master of Arts in Clinical Mental Health Counseling: Dance/Movement Therapy, MA

Student's Name: Elizabeth Barbera

Type of Project: Thesis

Title: Regulation Through Rhythm: A Literature Review On Dance/Movement Therapy Approachs to Nervous System Regulation

Date of Graduation: 5/18/2024

In the judgment of the following signatory this thesis meets the academic standards that have been established for the above degree.

Thesis Advisor: Wendy Allen