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Kestenberg Movement Profile and the Peabody Developmental Motor Scale – Second Edition for the Early Childhood Population: A Comparative Literature Review

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Abstract

Dance/movement therapy (DMT) and physical therapy (PT) are somatic-based interventions to improve our overall well-being. The difference between the two disciplines is that DMT is focused on the mind, body, and spiritual connection, and uses movement to foster the therapeutic healing process, whereas PT is used for rehabilitation or injury prevention. Both disciplines utilize movement assessment systems to analyze and measure physicality. In DMT, said movement assessment systems measure our preferential movement patterns, whereas, in PT, they assess physical deficits. This paper explores two movement assessment systems: the Kestenberg Movement Profile (KMP) for DMT, and the Peabody Developmental Motor Scale – Second Edition (PDMS-2) for PT. The definition, application, validity, and reliability of the two assessment systems, as well as the international applications, are explored. The overall experience of exploring the two systems is compared in the discussion section. Findings show that the KMP is a complex movement analysis tool that has the potential of unlocking the hidden meanings behind human movement patterns and preferences; however, to reach a mainstream use, the KMP must become more accessible to non-somatic-based disciplines. The PDMS-2 is a comprehensive tool to assess motor deficits of the early childhood population. Although it is accessible to a wide range of administrators, the full PDMS-2 kit is costly and only available in English. The test was not designed for children with any sort of impairments, which limits the accessibility pool. Future considerations include making the KMP materials accessible to a wider range of professions and updating the PDMS-2 kit to include multiple language options, as well as being mindful of those with diverse needs.

Keywords: Kestenberg Movement Profile, the KMP, Peabody Developmental Motor Scale – Second Edition, PDMS-2 Dance/Movement Therapy, DMT, Physical Therapy, PT

Kestenberg Movement Profile and Peabody Developmental Motor Scale – Second Edition

Introduction

Dance/movement therapy (DMT) is a therapeutic tool that uses the art of dance and movement to promote the healing process (ADTA, 2020). DMT is an alternative form of therapy offered to those who may want to explore the healing benefits of movement during their therapeutic journey. Dance/movement therapists receive extensive training through a rigorous master's program to practice and deliver effective movement-based interventions for those seeking an alternative healing experience. DMT is utilized by a wide range of populations, from pediatric to geriatric cohort. Physical therapy (PT) is a form of physical rehabilitation one can partake in after suffering an injury, illness, or disability (NHS, 2020). PT is a widely used service with a variety of populations to both prevent and mend physical trauma. Physical therapists must obtain a doctorate in PT and complete a residency to practice. PT is also utilized by a wide range of populations and can be delivered in various settings, such as hospitals, private practices, or in-home therapy. Although both DMT and PT utilize the body to promote a healing process, DMT is psychologically and social/emotionally oriented, while PT is physical rehabilitation and prevention-oriented. As the two share the physical component of healing, I explored the similarities and differences of the two disciplines, as well as an assessment system used in each discipline: the Kestenberg Movement Profile (KMP) for DMT and the Peabody Developmental Motor Scale-Second Edition (PDMS-2) for PT. The KMP is mainly utilized to analyze and map movement patterns and covers the whole lifespan; from in-utero movements to the elderly movement patterns. The KMP is a helpful tool for DMTs to keep track of the client's movements and fine-tune interventions for maximum efficacy. To become a KMP analyst, one must endure extensive and time-consuming training. The PDMS-2 measures gross and fine motor skill ability

in zero to five-year-old children. The PDMS-2 can be administered by any adult, as the PDMS-2 has a comprehensive kit, including toys, manuals, and scoring sheets. This literature review will explore the definition of the two disciplines, and the definition, domestic and global application, reliability, and validity of the assessment systems. I will then compare age-appropriate elements of the KMP to the PDMS-2 to examine any overlaps between the two systems. While I observed many strengths of both disciplines in providing relief to subjects, the outdated nature of the foundations of each discipline limits their applicability in a contemporary setting.

Literature Review

Dance/Movement Therapy

The American Dance Therapy Association (ADTA) defines dance/movement therapy (DMT) as "the therapeutic use of movement to promote social, cognitive, and physical integration of the individual, to improve health and well-being" (ADTA, 2021). DMT was born in the 1940s, created by dancers who understood the therapeutic benefits of movement. DMT is a holistic approach that utilizes the mind, body, and spirit connection to foster the healing process. Foundational concepts include viewing movement as the fundamental human language, the interconnection of the mind, body, and spirit, the use of movement as a functional, communicative, developmental, or expressive tool, and the use of movement as an assessment tool, as well as an intervention tool (ADTA, 2021). To become a DMT, one must attend an accredited graduate program accredited by the ADTA. An alternative route would be to undergo extensive study under a qualified DMT, as well as taking additional classes, such as movement observation, assessment, psychology, and fieldwork (ADTA, 2021). Upon completion of the requirements, the graduate will receive a Registered Dance/Movement Therapist (R-DMT)

accreditation through the Certification Board. An R-DMT is a basic credential, signifying an understanding of the field, as well as competence to begin a professional career. An R-DMT can apply to become a Board-Certified Dance/Movement Therapist (BC-DMT), after two years of full-time work. BC-DMT is an advanced accreditation, allowing one to open a private practice and provide supervision for the next generation of DMTs (ADTA, 2021).

Kestenberg Movement Profile

Dr. Judith Kestenberg, birth name Jehudit (Ida) Silberpfennig, was born in 1910, in Krakow, Poland, and later relocated to Tarnow, Poland (Sossin, 1999). Kestenberg trained in medicine, neurology, and psychiatry in Vienna, as her earliest interest was in movement and mind-body relations (Saxon, 1999; Sossin, 1999). In 1937, Dr. Paul Schilder invited Kestenberg to Bellevue Hospital in New York to pursue her academic interests. Kestenberg was a Professor Emeritus at New York University Medical School and "She went on to publish over 150 professional articles and seven books and served as teacher and mentor to psychiatrists, psychologists, psychoanalysts, dance and other creative arts therapists and movement specialists" (Sossin, 1999, p 53). Kestenberg is most known for her contributions to developmental psychodynamic theory, prevention, and intervention in early childhood, the co-creation of the Kestenberg Movement Profile (KMP), and her study pertaining to child survivors of the Holocaust.

Kestenberg founded the Center for Parents and Children in Long Island and was the director of Child Development Research (CDR), which ran for 18 years, studying the early development and methods of intervention. On top of the CDR, Kenstenberg, alongside her husband Milton, who sought compensation for Holocaust victims in Germany, created the International Study of the Organized Persecution of Children, and the Holocaust Child Survivor

Studies to understand the emotional state of Holocaust survivors (Saxon, 1999). Kestenberg and associates traveled around the world to collect recorded interviews with over 1,500 child survivors of the Holocaust, child survivors, and children of Nazis (Saxon, 1999). Kestenberg was fluent in English, French, German, and Polish and was said to have taught German children about the Holocaust, as well as writing two books in German (Saxon, 1999). Kestenberg's Holocaust survivor work sought out the root of hate and prejudice, in hopes of preventing a reoccurrence of racism-led genocide (Sossin, 1999). Kestenberg received numerous prestigious awards for her social justice work, including the "Eleanor Roosevelt Award from the American Jewish Congress, and the Holocaust Memorial Award from the New York Society of Clinical Psychologists" (Sossin, 1999).

Kestenberg created the Prenatal Project in the 1970s, to train expectant people and obstetric nurses on the "preferred movements of the fetus and newborn and facilitated early mother-child attachment" (Kestenberg, 1975, p 227). Kestenberg created a fetal movement notation, based on the natural attunement of expectant people and their fetuses. Pregnant people will start to notice various fetal movement patterns in-utero, which the fetal movement notation will capture in writing (Loman 2016). Through notating and understanding the fetus's movement patterns, the pregnant person will be able to replicate those movement patterns using their hands on the belly. This practice is done to increase the bond between the fetus and pregnant person, and to increase familiarity between the two when the baby is born, as "once the baby is born, most mothers will be more ready to respond to their baby's needs, to hold and give them security, based on the focused attention paid to the baby's movements and expressions already felt during the pregnancy." (Loman, 2016, p 230).

Definition and Application

Within DMT, there are a variety of movement analysis tools utilized to deepen our understanding of what movement is indicating. Among the many used, the Kestenberg Movement Profile (KMP) is utilized by those who primarily work with the early childhood population.

The Kestenberg Movement Profile (KMP) is a movement assessment system to elucidate nonverbal movement (Loman & Sossin, 2009). Kestenberg based the KMP on her extensive study of the Effort/Shape Analysis within the Laban Movement Analysis System (LBMA). With the foundational understanding of LBMA, Kestenberg originally developed the KMP utilizing Anna Freud's developmental psychoanalytic metapsychology (Freud, 1965), which has evolved since its creation (Loman & Sossin, 2009). This framework was utilized due to a realization that little information was available regarding movement analysis within the psychoanalytic paradigm. Concerns grew over the lack of research on "preverbal infants and children and sought a methodology that would apply comparable measures to the infant, child, and adult" (Loman & Sossin, 2009, p 238). The KMP was developed at the Center for Parents and Children, from 1972 through 1990, where new methods of nonverbal movement assessments were assessed on children pre-birth to four years of age, as well as on the parent-infant/child dyad and family relations (Loman & Sossin, 2009). The KMP assessments were conducted in-person, as well as through video recordings. The regular assessments granted an opportunity to "apply and clarify the diagnostic utility of the KMP in relation to clinically known adults and children" (Loman & Sossin, 2009, p 239). The KMP evolved over years of research, with findings including links between certain movement patterns with developmental and psychological phases. The primary research goal of the KMP was to create a variety of preventative methods for emotional disorders

with the foundational theory of developmental psychoanalytic theory, as well as utilizing a multitude of psychotherapeutic techniques (Loman & Sossin, 2009). In addition to assessing intrapersonal movement patterns, the KMP is also applicable to gauge the interpersonal connection between family members, as well as the dynamics between a fetus in-utero and its carrier. In the early stages of the KMP development, it was used "to evaluate congenital movement preferences, levels of developmental achievement, as well as developmental arrest or regression, and factors indicative of cognitive and social abilities" (Loman & Sossin, 2009, p 239).

The KMP is composed of nine different categories, which are categorized within two systems (Loman & Sossin, 2009). System I is categorized as developmental motor patterns, from the fetus continuing onto late adulthood, which includes tension-flow rhythms, tension-flow attributes, pre-efforts, and efforts. System II is categorized as developmentally appropriate relations to other people and objects, which include bipolar shape-flow, unipolar shape-flow, shape-flow design, shaping in directions, and shaping in planes.

Tension-flow rhythms (T-F rhythms). T-F rhythms describe developmental movement pattern preferences in accordance with the five major developmental phases; oral, anal, urethral, inner-genital, and outer-genital phases (Loman & Sossin, 2009). As people progress through the developmental phases, their movement patterns evolve to reflect the stages they are in, categorized as the 10 rhythmic patterns within the KMP: sucking, snapping/biting, twisting, strain/release, running/drifting, starting/stopping, swaying, surging/birthing, jumping, and spurting/ramming. The developmental phase and the rhythmic patterns correspond with each other, and "at the height of each phase, we expect to see the largest proportion of rhythms typical for that phase, but all of the rhythms are still available to the individual" (Loman & Sossin, 2009,

p 240). When the rhythm is in direct correspondence to the developmental stage, it is called a pure rhythm, which can be classified as a motor expression of the developmental need; for example, oral sucking is a pure rhythm, since a person can be in the oral phase developmentally, and they are directly satisfying their needs through sucking (Loman & Sossin, 2009). As stated above, although one may be in one stage of development, there may be motor manifestations that are out of the norm in terms of the 10 rhythmic patterns; this is described as mixed rhythms, which most likely indicate preferences and adaptations to specific contexts.

Tension-flow attributes (TFA). TFA are the physical manifestation of muscle tension (Loman & Sossin, 2009). Within the TFA, there are three flow attributes: bound flow, free flow, and neutral flow. Bound flow is a movement pattern when opposing muscles contract together. Free flow is a releasing movement pattern when one muscle is not counteracted by the other. Neutral flow is a movement pattern describing decreased muscle function, such as limpness or numbing, which could be an indication of poor health. The attributes aspect of the TFA describes "the tension changes along three dimensions: even or adjusting, high or low intensity, abrupt or gradual." (Loman & Sossin, 2009, p 242). Motor preferences in terms of the TFA are identifiable from birth and become stable with maturity. Said motor preferences are affected by development and temperament.

Precursors to effort (interchangeable with pre-effort). Pre-efforts are the bridge state between TFA and effort within the KMP. Pre-effort stems from the effort qualities used in LBMA and is defined as the manipulation of environments and its "motor counterparts of defense mechanisms and styles of learning" (Loman & Sossin, 2009, p 243). There are six pairs of pre-efforts: channeling vs. flexible, staining and vehemence vs. gentle, and sudden vs. hesitating. The former of the pair depicts fighting elements, while the latter of the pair describes

indulgent elements. The pre-efforts are both body-oriented, as well as reality-oriented; thus, the connection between TFA and efforts (Loman & Sossin, 2009).

Efforts. Efforts are motor manifestations of an individual's reality, in terms of space, weight, and time (Loman & Sossin, 2009). Within each element, two sub-elements are distinguishing between fighting efforts, and accommodating efforts. For space, there are direct and indirect elements; for weight, there are strength and lightness; and for time, there are accelerating and decelerating elements. A person's effort elements can be traced back to pre-efforts, or as far as their TFA, revealing their preferences of attention, intention, and decision-making (Loman & Sossin, 2009).

Bipolar shape-flow. Bipolar shape-flow encompasses the symmetrical growth and withering of the body, in relation to environmental stimuli (Loman & Sossin, 2009), much like when our bodies rise and fall while breathing. There are three dimensions within the growing and shrinking: horizontal (width), vertical (length), and sagittal (depth). Bipolar shape flow describes our affect response to the environment, driven by fighting or indulging intentions, as well as our preferences towards comfort and discomfort; "Hence, self-in-the-world feelings are conveyed through bipolar shape flow" (Loman & Sossin, 2009, p 245).

Unipolar shape-flow. Unipolar shape-flow is the asymmetrical growth and withering of the body, depicting allurement or revulsion to environmental stimuli (Loman & Sossin, 2009). Much like bipolar shape-flow, unipolar shape-flow operated within three dimensions: horizontal (lateral vs. medial), vertical (cephalad/head vs. cauda/tail), and sagittal (anterior vs. posterior). The main difference between bipolar shape-flow and unipolar shape-flow is the way the body grows, in orientation to the three dimensions. For example, in the sagittal unipolar movement, the body is growing anteriorly or posteriorly, whereas, in the sagittal bipolar

movement, the body is growing in both directions. The unipolar shape-flow movements are an evolution from unintentional actions, "and contributes to a system of extending the body in space (shaping of space in directions)" (Loman & Sossin, 2009, p 246).

Shape-flow design. Shape flow design describes movement designs created in our personal space. The movement of the shape-flow design mirrors an individual's pattern of relatedness, "influenced by cultural conditioning, congenital preferences, developmental stages, and situational factors" (Loman & Sossin, 2009, p 246). The movements are notated centrifugally (away from the body), or centripetally (towards the body), with three classifications of linearity, amplitude, and angularity (Loman & Sossin, 2009). The notation is like tension-flow, with the difference of spatial application, rather than the tension criterion.

The shaping of space in directions. Shaping of space in directions forms a defined extension of the body in a dimensional space. Said movements provide a platform between remote objects and an individual (Loman & Sossin, 2009). There are three patterns of directions in space: horizontal (movements across and sideways of the body), vertical (downward and upward movements), and sagittal (backward and forward movements). These patterns are linked to "precursors of effort, defenses against external stimuli, and environmental learning responses" (Loman & Sossin, 2009, p 246).

The shaping in space in planes. Shaping in space in planes is defined as the configuration of space created by concave and convex shapes (Loman & Sossin, 2009). There are three types of shapings: horizontal (enclosed and spread), vertical (descend or ascend), and sagittal (retreat or advance). On top of the shapings, the spatial planes consist of a principal and an accessory dimension; the horizontal plane's accessory dimension is sagittal, using the horizontal shaping qualities (enclosed and spread) in exploration. The vertical plane's accessory

dimension is horizontal; using the vertical shapings qualities (ascend and descend) for confrontation. The sagittal plane's accessory dimension is vertical, using the sagittal shaping qualities (retreat and advance) for anticipatory actions. Loman and Sossin (2009) describe "shaping of space in planes express multi-dimensional relationships with people as well as some inanimate objects linked to representational experience and their internalized images" (Loman & Sossin, 2009, p 247).

KMP phases are broken down into specific age groups: sucking and biting for the first year, twisting and strain/release rhythms for the second year, running/drifting rhythms for the third year, swaying rhythms for the fourth year, jumping rhythms for the fifth year, and spurting/ramming rhythms for the sixth year (Loman, 2016). Each rhythm indicates a developmentally typical attribute; for example, "through the sucking rhythm in the first half of the year, children learn to take in nourishment, explore objects through the mouth, and soothe themselves through thumb sucking and/or pacifiers." (Loman, 2016, p. 233). The application of KMP is illustrated through various techniques that match the child's developmental needs, such as creating an environment where the caregiver holds the child and matches their muscle tension through rocking and breath attunement, to foster a sense of support for the infant. Ultimately, KMP encourages the usage of similarity and familiarity for the child, by attunement and replicating their movements to convey presence and support from the caregiver (Loman, 2016).

To become a certified KMP analyst according to the Kestenberg Movement Profile organization (2021), one must complete various levels of training. Level One training entails acquiring foundational KMP knowledge from a certified KMP analyst, such as KMP observation, notation, scoring, diagramming, and interpretation skills. Level One takes around 90 hours of study. Upon satisfactory completion and approval from the KMP committee, Level Two

training can begin once an application has been submitted to the KMP committee. Application materials include a letter of intent, a 250-dollar fee, and an accurate KMP analysis of an adult (DVD sent from the KMP committee) including the eight diagrams and body attitude analysis as a written document (five to seven pages). The application materials will be reviewed by two KMP analysts to determine the quality of work and reliability (KMP, 2021). Level Two training requirements include a demonstration of the ability to reliably collect movement data utilizing the KMP, accurately construct diagrams, and precisely analyze the KMP diagrams and notation system.

Kestenberg's DMT Legacy: Approaches with Pregnancy, Young Children, and Caregivers

Loman (2016) illustrated the different applications of DMT and KMP throughout the early childhood years, ranging from prenatal to children five years of age. Loman compiled her experience while working at the Center for Parents and Children in Long Island, New York, as well as her work with the same population in Keene, New Hampshire. Loman (2016) illustrated the different uses of KMP, one of which is to use KMP as a diagnostic tool for those who may benefit from additional parenting courses, as the notation of the fetal movements requires empathetic attunement; and those who were not expecting a baby may have difficulty connecting with the fetus nonverbally. Other uses of KMP/DMT applications include attunement exercises for adoptive parents, as they typically do not have the opportunity to connect with their child in-utero. The use of the touch attunement exercises is encouraged for adoptive parents to recognize their child's needs, through non-verbal communication.

Loman (2016) highlighted the use of KMP and DMT applications for the early childhood population, starting from pregnancy to five years of age. Throughout the article, the vocabulary to describe those who are expecting varies; from pregnant women to expecting parents. Not all

pregnant people identify as women, and not all expecting people can keep their unborn child. Although not intentional, these types of exclusionary language may be discouraging for those who are marginalized. As for the fetal movement notation, the notation is reliant on empathetic attunement; therefore, those who are not able to keep the unborn child may experience adversity towards connecting to the fetus. Regarding the specific step of journaling while expecting, "the expectant mother was encouraged to keep a journal of her fetal movement notations, physical sensations, feelings, and dreams" (Loman, 2016, p227). This sentence alone is packed full of assumptions, such as the fact that the pregnant person identifies as a woman, that they are keeping the unborn child, and the pregnant person has the literacy skills to journal their experiences. Pregnant people may not want to be referred to as mothers or may not be able to keep the child. The fetal movement notation is completely reliant on people keeping their babies; therefore, it may not be as applicable for those who are not able to keep their unborn children. The demographic information of the pregnant people, as well as the children's ages, zero to five, are unknown.

Movement, Art, and Child Development Through the Lens of an Innovative Use of KMP

Burrill (2011) explored the use of KMP for data analysis of preschool-age children. KMP was used "to gain insight into why creative, intelligent children sometimes fail in school" (Burrill, 2011, p 112). A qualitative-emergent research design was used, where Burrill was an observer as well as a participant, where Burrill immersed themselves in the school environment. This approach was utilized to better understand and observe children in their natural environment (Burrill, 2011). The children, ages three to five, were videotaped participating in four classroom activities: morning circle time, playtime, improvisational dance, and artmaking. The KMP was utilized to observe and analyze the group movement patterns using the videotapes. The results

show “a correlation between the degree of freedom of movement and many facets of development and learning” (Burrill, 2011, p 117).

The data was analyzed and notated by Burrill, who is a trained KMP notator through the dance/movement therapy program at Antioch University New England (Burrill, 2011). An experienced KMP trainer was consulted to better understand the data. Limitations of this study include a lack of control group, lack of notator reliability, and subconscious bias of Burrill’s experience at school as well as the importance of art (Burrill, 2011). When a study lacks a control group, the data gathered cannot be compared to a stable source, which could undermine the whole study itself. Burrill mentions that “a corroborative notator for the three activity profiles would have better-served reliability” (Burrill, 2011, p 117). Burrill’s own primary school experience, as well as their personal belief on the importance of art in a child’s education, may also have influenced the data. The study does not mention the demographic information of the children observed and analyzed.

The KMP and treatment planning for nonverbal social skills in children with Down Syndrome

Gass et al. (2012) examine the use of KMP as a qualitative movement assessment tool to create a bespoke treatment plan for a non-verbal child diagnosed with down syndrome (DS). A set of six-year-old fraternal twins, one diagnosed with DS, Sasha, the other typically developing, Sara, were videotaped playing outdoors and indoors. KMP is a unique movement analysis tool that does not require a verbal component in its assessment and only focuses on the movement qualities of those who are being assessed. KMP was chosen for this study for this exact fact, alongside a quantitative assessment tool, the Vineland Adaptive Behavior Scale Second Edition (Vineland-II), as well as observing the child in their home environment (Gass et al., 2012). The

Vineland-II was utilized due to its reliability as a quantitative assessment tool for those who are developmentally delayed. A treatment plan was created for Sasha based on the KMP analysis, highlighting their dominant movement patterns as well as non-dominant patterns to strengthen their movements.

Although the study provides an in-depth analysis of Sasha's KMP scores, it omits to notify the reader of notation information, such as who gathered the data, who analyzed and notated, and whether there were any comparisons done with those who were of similar ages. As the KMP analysis provided is in detail, one can assume that the analysis was thoroughly conducted by a notator who knows what they are doing, however, we are left wondering about the legitimacy and reliability of the results. The demographic information about the twins, including how they were selected for the study, as well as their race/ethnicity and geographic location, are also absent.

Reliability and Validity of KMP

The KMP: Performance of novice raters. Koch (2002) illustrates the reliability of novice KMP raters. KMP is amongst many assessment tools utilized by DMTs, however, to ensure clinical accuracy, reliability, and validity, those administering the assessment must be trained (Koch, 2002). The generalization theory was used to test the reliability of the novice assessors, as "it allows simultaneous quantification of multiple sources of measurement error" (Koch, 2002, p 76). The participants assessed in the study were chosen through a community organization the author had access to, with the conditions that they were physically fit, and not institutionalized. The raters were five graduate DMT students and classmates with the author. The assessors were DMT students since KMP users are mostly DMTs (Koch, 2002). The raters

undertook a 45-hour training course, inclusive of lectures and discussions at the Laban Bartenieff Institute of Movement in West Chester, PA. The participants were filmed for 30 minutes, engaging in conversations. The videotape was then edited down to 12 minutes for the raters. The raters viewed the tapes individually, then created three KMP diagrams based on the tension-flow rhythms, bipolar, and unipolar shape-flow (Koch, 2002). These three KMP diagrams were chosen because they are rhythms that are present during unconscious movements. The three diagrams consist of components of the two major systems in KMP; tension-flow rhythms belong to System I and bipolar and unipolar shape-flow are part of System II" (Koch, 2002, p 78). The raters were given a standardized rating procedure handout and independently rated the videotapes. The raters came together upon completion, then entered the data into a KMP scoring software (Koch, 2002). The generalizability theory was used to analyze the results. The results indicated rating difficulties amongst the novice raters. The rating of unipolar shape-flow assessment was the most difficult for the raters to assess. A 45-hour training, in theory, is a substantial training period, however, for a complex assessment system, such as KMP, it may require a prolonged period of regular assessment for the raters to be accurate and comfortable (Koch, 2002). Koch suggests implementing the issue of reliability in the initial training period, as personal bias and inexperience could lead to unreliable ratings.

Although the recruitment information for both the participants as well as raters is present, the demographic information, such as race, ethnicity, and age, for the participants and raters, are absent, apart from the fact that they were classmates of the author and graduate-level DMT students. As the discussion states, personal bias can come into play when conducting an assessment, therefore the demographic information should be disclosed for transparency purposes. The tool of measurement used to measure the reliability of the raters was specifically

stated as the generalizability theory. The explanation of the theory was rather complicated as it relied on jargon and was not as digestible for those who are unfamiliar with the theory. The paper does not explicitly state who conducted the measurement of the reliability of the raters, and the reader is left to assume it was the author alongside another person. This is somewhat problematic, as, without the coder information, the reader is left guessing whether the data may have been influenced by coder bias or not. Some flaws in the design of the pilot study include the participant population, as well as the lack of test-retest reliability. As KMP assessments can be utilized with a wide variety of populations, ranging from in-utero to adulthood, Koch (2002) reckons that the pilot study could have benefited from rating children, rather than adults. Developmentally speaking, young children are more inclined to move around than adults and could have naturally demonstrated a broader range of movement for the raters to notate. The pilot study also lacks the test-retest reliability information. Although the study was to measure the reliability of novice raters, perhaps a comparison of novice raters throughout an extended period would have produced comparable data. To a certain extent, any person who is a novice at a particular subject is bound to make mistakes. With this basis in mind, the pilot study could have been conducted over a few months, to test the novice reliability, as well as improvement rate of said novice raters. This could have produced two sets of desirable data: one about the reliability of novice raters, as well as whether the improvement of reliability with continued practice of rating KMP.

KMP: International applications. Dvir et al. (2020) explored the efficacy of the tension-flow rhythm (TFR) within the KMP as a notation system when conducting music therapy for children diagnosed with autism spectrum disorder (ASD) in Israel. The purpose of this study is to "identify yet another possible biobehavioral mechanism between music therapists and

children with ASD, namely, the way in which muscles flow between contractions and release over time" (Dvir et al., 2020, p 3). The study utilized data from Geretsegger et al.'s (2012) study, TIME-A, which investigated the efficacy of improvisational music therapy on social communication with children diagnosed with ASD. Dvir et al. (2020) mirrored the TIME-A study and recruited 19 culturally diverse participants who participated in the TIME-A study as well. The children's ages range from four years old to six years old, all diagnosed with ASD prior to the study. The children were subjected to the Autism Diagnostic Observation Schedule (ADOS) at the beginning of the study to confirm their diagnosis status. In addition to the ADOS, the Kaufman Assessment Battery for Children (K-ABC) was used to test the children's cognitive abilities prior to the study (Dvri et al., 2020). The children attended music therapy sessions for 14 to 23 weeks, which were taped for the movement analysis component of the study. Both the children's and the music therapist's movements were analyzed based on the TFR category of the KMP. The TFR is "defined as periodic alternations in muscle tension that create discernible cyclic patterns of repetitive movement (for example finger tapping, back rocking, hand flapping, and more)" (Dvir et al., 2020, p 4). The music therapy session was recorded; five minutes at the beginning and end of the session. Two KMP analysts examined the video for movement patterns of the children, as well as the music therapist. The KMP analysts underwent 60 hours of KMP training. Above the TFR notation, the study also examined the attunement between the music therapist and child. The "Ethics Committee for the Evaluation of Research with Human Subjects of the Faculty of Social Welfare & Health Sciences, at the Haifa University, Israel" (Dvir et al., 2020, p 3) approved this study.

Results indicate there were no significant changes in attunement speed in comparison to the beginning of the study to the end and no significant changes with the ADOS scores from the

beginning of the study to the end. The attunement between the music therapist and child was measured using the TFR, and the study found that “the music therapists were significantly more attuned to the children, using body rhythmic patterns characterized by medium frequency two rhythmic cycles per second) and low intensity” (Dvir et al., 2020, p 7). The study and the use of the KMP enlightened the researchers about the use of movement, in congruence with the music rhythms could possibly improve the ability for synchronization between therapist and client (Dvir et al., 2020). Limitations of this study are the following: a small sample size, unequal representation of genders (16%), and cultural diversity. The cultural diversity prevented the generalization of the children to just a group of children with ASD (Dvir et al., 2020). Future considerations include further studies into the mechanism of attunement, as well as the use of a control group to measure the efficacy of the study; “In the future, it would be helpful to compare the attunement of children with ASD within various types of therapeutic interventions” (Dvir et al., 2020, p 8). Word choices such as “normal” describing children's development should be changed, such as to “typically developing,” as the former is exclusionary language suggesting developmentally diverse children are “abnormal”.

Physical Therapy

The American Physical Therapy Association defines physical therapy (PT) as “movement experts who improve quality of life through prescribed exercises, hands-on care, and patient education” (APTA, 2020, p 1). Physical therapists are trained to diagnose and treat all populations, ranging from infants to geriatrics. PT itself can be utilized as a rehabilitative or for preventative measures. The process begins with an assessment by a trained professional, followed by developing a treatment plan to meet the client’s goals, whether it is to increase mobility, manage pain, restore function, or prevent further injury (APTA, 2020). Physical

therapists work in various settings, such as hospitals, in or outpatient clinics, homes, schools, sports facilities, private practices, or nursing homes. Physical therapists who practice in the U.S. undergo extensive schooling and must acquire a doctorate in physical therapy from an accredited program, enroll in a residency or fellowship program, and pass a state licensure exam (APTA, 2020).

Peabody Developmental Motor Scales-Second Edition

Definition and Application

The Peabody Developmental Motor Scales-Second Edition (PDMS-2) is a widely used motor assessment tool for the pediatric population. The PDMS-2 was created by Rhonda Folio and Rebecca Fewell (2000) and was designed to assess gross and fine motor skills for ages zero to six. The test is divided into three scales: Gross Motor Quotient (GMQ), with subsets Reflexes, Stationary, Locomotion, and Object Manipulation; Fine Motor Quotient (FMQ), with subsets Grasping and Visual-Motor Integration; and Total Motor Quotient (TMQ), which measures overall motor skill ability (Folio & Fewell, 2000; Bunker et al., 2003). The administration takes 20 to 30 minutes per subset and it is recommended to administer it in a familiar setting for children, such as preschool settings or early intervention centers. The test was designed to be administered by occupational therapists, physical therapists, diagnosticians, early intervention specialists, adapted physical educators, special education teachers, and others interested in motor assessments for children (Bunker et al., 2003). The assessment does not require additional training or any specific credentials to administer, as the manual provides clear scoring criteria and its objectives. The PDMS-2 kit contains a manual, picture book, summary forms, record booklets, object kit, shape cards, and computer software for scoring, and costs around US$500

(Bunker et al., 2003). Some items needed for the assessment are not included in the kit, which could affect the standardization of the assessment (Bunker et al., 2003). The six subsets measure early motor development in young children. The Reflex subset includes eight items for a child to react to their environment. The Stationary subset measures sustainment of control and maintaining equilibrium through 20 items designed to assess those qualities. The Locomotion subset consists of 89 items pertaining to developmental movements, such as crawling, walking, running, hopping, and jumping. The Object Manipulation subset includes different activities to measure a child's object control using a ball, such as catching, throwing, and kicking. This subset is only for those 12 months or older. The Grasping subset consists of 26 items to assess a child's holding skills, ranging from one hand grasps to using two hands with controlled finger movements. The Visual-Motor Integration subset contains 72 items to measure perceptual-motor functioning, such as hand-eye coordination, with such activities as reaching and grasping building blocks, and coping designs (Folio & Fewell, 2000; Bunker et al., 2003). The scoring for the GMQ, FMQ, and TMQ is done with a mean of 100, and a standard deviation of 15, and the subsets are scored with a mean of 10, and a standard deviation of 3. The scoring information is provided in the Illustrated Guide of Administering and Scoring the PDMS-2 Items, which is included in the PDMS-2 kit. The normative sample of the PDMS-2 consists of 2,003 typically developing children from 46 states in the US and British Columbia, Canada, with data collection in winter of 1997 and spring of 1998 (Bunker et al., 2003). The normative sample population is representative of the Census data of 1997 for both age, gender, and race; however, the Hispanic population is underrepresented (Bunker et al., 2003). The test results indicate the PDMS-2 to be both reliable and valid, however, Bunker et al. (2003) recommend widening the sample pool to

include children with various developmental delays, such as speech-language delays or intellectual delays (Bunker et al., 2003).

The PDMS-2 is a sound motor assessment tool to measure the motor function of children ages zero-to-six. The drawback of the PDMS-2 is that the kit itself is costly, and the normative sample is from 1997 and did not include those with developmental delays. The PDMS-2 is due for an update, as, within the past 20 years, there have been changes demographically, and the normative population does not reflect the current Census data.

PDMS-2 performance of Low SES Preschool & Typically Developing Children

Liu et al. (2015) utilized the PDMS-2 to measure motor skill disparities of low socioeconomic (SES) children, in comparison to typically developing children of the same ages, three to five. This is a comparative study on "comprehensive motor skill investigation of children identified as low SES to their age-matched typically developing peers using PDMS-2." (Liu et al., 2020, p 3). Liu et al. (2015) hypothesized that the lower SES children would demonstrate significant motor delays in accordance with the PDMS-2, in comparison to their higher SES counterparts.

Fine and gross motor development occurs in early childhood and becomes a crucial foundation for subsequent physical development, as "early fine and gross motor skill development has been found to predict later cognitive development and is related to engagement in physical activity and perceived competence" (Liu et al., 2015 p 1). Fine and gross motor skills are not naturally acquired; rather, the development of these skills involves precise planning, repetition, optimism, and reassurance. Research suggests that low SES children are often left behind their middle-class counterparts, due to fundamental inequalities such as lack of space (both indoor and outdoor), inadequate equipment, funding deficiency, and information scarcity

regarding proper motor development (Liu et al., 2020). Unfortunately, lack of fine and gross motor skills may be a contributor to lower cognitive development, which could, in turn, decrease participation in sports and other physical activities, and reduce academic achievement.

Sixty-eight preschool children were selected from the same school district for the study sample; 34 were identified as low SES, with the remaining 34 identified as middle to high SES. The criteria for identifying as low SES "was defined as being financially disadvantaged and having limited access to facilities or environments that promote physical activity" (Liu et al., 2020, p 3). The PDMS-2 was administered by two research assistants with adequate training (one providing instructions, the other kept scores), in a gym at the local elementary school. The assistants were unaware of the hypothesis of the study to secure unbiased results. The entire PDMS-2 was administered, and five subsets were assessed: stationary, locomotion, object manipulation, grasping, and visual-motor integration skills (Liu et al., 2020). The demographic information regarding race and ethnicity was absent.

The results supported the hypothesis; low SES children presented significant motor variances in comparison to the children with middle to high SES. Specifically, the performance of locomotion, object manipulation, and visual-motor integration showed vast differences between the two economic statuses. Limitations of this study include the delicate age group of the children, as they were easily distracted or apprehensive about the test. Future considerations should be made in terms of the testing environment; the PDMS-2 manual suggests administering the test in a familiar environment for the child so additional options for testing venues might be required to reduce distractions and provide familiarity. The study often used verbiage indicating those with middle/high SES are "typically developing," whereas when referencing the low SES children, they only used their economic status as the defining factor. An argument could be made

that the language used to distinguish between participants from differing SES cohorts as "typically developing" or "lower SES" is prejudiced. Additionally, if the study were conducted in the same manner within multiple population samples throughout the country, and the hypothesis is supported repeatedly, it would be hard to argue against the existence of systemic inequalities, such as wealth and educational disparities, within the U.S.

Reliability and validity of PDMS-Second Edition

Fine motor skills are defined as manipulation and attainment skills when executing tasks using one's hands (Van Hartingveldt et al., 2005). Fine motor skills are an essential skill for a young child to possess, as, without this base skill, they may present delays in other developmental milestones. Van Hartingveldt et al. (2005) conducted a quantitative study to research the testing qualities of the Fine Motor Scale of the Peabody Developmental Motor Scales – Second Edition (PDMS-FM-2). Eighteen Dutch children ages four and five were the test subjects, meeting criteria such as mild fine motor delays that were not caused by a neurological condition such as cerebral palsy (Van Hartingveldt et al., 2005). The Checklist of Fine Motor Skills within the Movement ABC was used to determine whether the children were presenting fine motor delays. The procedure included administering the PDMS-FM-2 twice to 12 children, by administrator #1, within one week. The inter-rater reliability was determined by videotaping the 12 children partaking in the assessment administered by administrator #1 (Van Hartingveldt et al., 2005). Administrator #2 viewed the tapes and scored in random order.

Results indicate that the reliability met the criteria of the manual of the PDMS-FM-2, and the validity met the criteria of both the PDMS-FM-2 as well as the M-ABC. Van Hartingveldt et al. (2005) questions the clinical relevance of the PDMS-FM-2, as only 39% of the children tested

resulted in having fine motor difficulties according to the PDMS-FM-2, rather than the predicted 80%. This study comprehensively states relevant demographic information such as how and where the children were recruited from, as well as the relevance for the assessment. Van Hartingveldt et al. (2005) states the PDMS-FM-2 was normed on American children, which produced discrepant results of fine motor delays according to the M-ABC, which was normed on both American and Dutch children.

Measurement Properties of Fine Motor Scale of PDMS – Second Edition. Chien & Bond (2009) investigate the measurement properties of the PDMS-FM-2, using a Rasch analysis. A Rasch analysis, also known as the Rasch model, "aims to determine the extent to which the observed data satisfy the model's stringent requirements for interval level measurement" (Chien & Bond, 2009, p 377). The underlying principle is that the ability of the participants as well as the difficulty of the test determines the performance of the assessment-taker (Chien & Bond, 2009). The test participants were 419 children recruited from six different daycares and kindergartens, as well as four rehabilitation centers in Northern Taiwan. The sample size is 342 typically developing children ages birth to six. They met the criteria such as full-term births, typical birth weights, and absence of any sensorimotor deficits. The additional 77 children presented with fine motor (FM) delays, with ranging diagnoses from Down syndrome, cerebral palsy, autism, and other sensorimotor or developmental delays. All the participants were administered the PDMS-FM-2, by a trained administrator (Chien & Bond, 2009). The Rasch model was used to investigate the following: (1) the appropriateness of the three-point rating system, (2) the uni-dimensionality of the individual subsets and composite scale, and (3) possible item bias across sex and FM status (Chien & Bond, 2009, p 378). The results indicate that the three-point rating scale system could be collapsed to a dichotomous rating system, the grasping

and visual-motor subsets could be cut down in numbers, and item bias was apparent across sex and FM status (Chien & Bond, 2009).

The PDMS-2 is only available in English; therefore, the authors of the study translated the test to administer it to the children in their native tongue. The PDMS-FM-2 was normed on American children, which may have caused some discrepancies with the results. The study highlights the cultural influences that may have affected the outcome of the PDMS-FM-2, such as the advanced dexterity of East Asian children in comparison to their Western counterparts, which indicates the need for advanced test items to increase the ceiling effects (Chien & Bond, 2009). The information regarding the coder of the assessment, as well as who performed the Rasch analysis, is absent from the study.

PDMS-2: International applications.

Motor profile of Portuguese preschool children on the PDMS-2: A cross-cultural study. Saraiva et al. (2012) explored the PDMS-2 through a multicultural lens. The normed sample of the PDMS-2 was children, from birth to 71-months, who resided in the United States, across 46 states, as well as one Canadian province, at the time (Folio & Fewell, 2000). Although the PDMS-2 is a highly regarded assessment tool to measure gross and fine motor skill, the author questions: “is PDMS-2 tool considered a valid and reliable discriminative measure to evaluate children’s motor performance from a different cultural background of the normative sample?” (Saraiva et al., 2012, p 1976). Multiple cross-cultural studies indicate discrepancies when assessing children who have different cultural backgrounds (Saraiva et al., 2021). The purpose of this study is to find the following: “(1) to examine the cultural sensitivity (regional relevance) of the scales for a sample of Portuguese children aged 36–71 months; (2) to analyze

the age and sex effects on children's motor performance; (3) to characterize and compare the motor performance of Portuguese preschoolers with the US norms" (Saraiva et al., 2012, p 1967). The author tested their hypothesis on Portuguese children, as previous cultural studies have not covered this demographic. The participants were 540 children, 255 males, and 285 females, ages ranging between three to five years old, recruited from fifteen public schools in Northwest Portugal (Saraiva et al., 2012). Participant criteria include typically developing children ages 36 to 71 months. The PDMS-2 was translated into Portuguese, and the assessment was conducted in accordance with the manual guidelines. The data was collected through a videotape, which was used for observation and scoring later (Saraiva et al., 2012).

Results indicate a difference between age and sex performance, as well as the difference in motor development between Portuguese and American children. Vast discrepancies between the norm and the assessed population were found in all subsets. Saraiva et al. (2012) reckon the performance discrepancies are most likely due to cultural differences; American children may have more opportunities to promote object manipulation and locomotion skills, which are the subsets that the Portuguese children underperformed in, whereas the Portuguese children may be fine motor oriented (Saraiva et al., 2012). According to the OEDC (2012a &b), in Portugal, 70% of mothers who have children under six are employed, therefore rely on childcare services, and 73% of three-year-olds, as well as 93% of five-year-olds, are in early childhood education programs, whereas in the US, only 51% of children ages three-to-five are in early childhood education programs. As for the age and sex performance differentiation, the older children performed better than their younger counterparts, as expected (Saraiva et al., 2012). The boys and the girls performed differently despite being the same age, where the boys performed better in the gross-motor skill-oriented subsets, and the girls performed better in fine-

motor skill-oriented subsets. This could be due to gender stereotypes of children's activities and toys, different exposures to motor-oriented activities, and socio-cultural expectations of boys and girls (Saraiva et al., 2012).

This cross-cultural study of the PDMS-2 enlightened the reader regarding cultural differences between the normed population and Portuguese children. Recruitment information was present, as well as demographic information. Although the data analysis information is present, the information regarding who conducted the analysis is absent. The cultural analysis between U.S. children and Portuguese children was thorough and comprehensive. The author clearly stated the possible reasoning behind the performance differences. Although statistics may be accurate to a point, it could also lead to assumptions that may be detrimental to the study. For example, when the study mentioned the possible gender stereotypes that children in Portugal are subjected to in terms of play activities, this could only be the case for a certain number of children.

This paper illustrated the limitations of U.S.-centric assessments, which use a unilaterally normed population, to the global community. When various assessments are normed with a certain population from one country, it becomes exclusive of other cultures.

Reliability, content, and construct validity evidence for Brazilian children. Zanella et al., (2021) studied the construct validity, content, and reliability of the PDMS-2 when assessed on Brazilian children. Several assessments to detect motor delay have been developed and tested on predominantly Canadian, English, or American children, which produce invalid validity and reliability when tests are conducted on children from different cultures (Zanella et al., 2021). Although some assessments to detect motor delays were validated in Brazil, none of the assessments covered the ages 18 months to 36 months; a crucial time to detect and treat motor

impairments (Zanella et al., 2021). Hence, the PDMS-2 was selected "to investigate the validity and reliability of the PDMS-2 for assessing Brazilian children's gross and fine motor skills from zero and six years" (Zanella et al., 2021, p 2). The participants included 13 health experts and professionals, such as Ph.Ds. in human movement sciences and child development, and certified occupational therapists, and physical therapists. Six hundred and thirty-seven children were tested, of which 93 children randomly selected were re-tested to conclude the reliability. The eligibility criteria were children in an age range of 30 weeks gestational age to 5 years and 11 months. Demographic information is as follows: pre-term and full-term children, both female-identifying and male-identifying, were recruited from rural and urban areas, with ethnicities including White, Black, and Pardo populations, from varying socio-economic backgrounds (Zanella et al., 2021). Once the participatory agreement was obtained through the legal guardian, the motor assessment was conducted at the children's home or school environment, with the equipment necessary to conduct the assessment.

Results indicated the Brazilian version of the PDMS-2 has similar psychometric characteristics to the original version (Zanella et al., 2021). The health expert participants concluded the PDMS-2 as a valid motor assessment tool to measure gross-motor and fine-motor skills of Brazilian children (Zanella et al., 2021). The internal consistency, as well as the test-retest reliability, were both strong in comparison to the original assessment measurements.

Zanella et al. (2021) comprehensively examined the validity, content, and reliability of the PDMS-2 when conducted on Brazilian children. The authors provided information regarding the recruitment process, ethnicity of the children, as well as the occupational background of the adults involved in the study. The authors omitted other demographic information, such as age and race, for the adults involved in the study. As personal bias can affect study results, the

complete demographic information should be included in the method section. The article does explicitly outline ethical procedures taken to ensure proper ethical measures were taken to conduct the study, such as gaining the approval of the ethics committee, obtaining informed consent from the caregivers' children, and considering the children's wellbeing when conducting the study (Zanella et al., 2021).

Discussion

Upon examining the KMP and the PDMS-2 as a novice of both systems, my findings are as follows. The KMP is a movement analysis tool utilized mostly within the DMT field to map the movement preferences and patterns of clients. The movement notation can begin from in-utero movements, throughout the lifespan to the geriatric population. There are two systems (System I and System II), containing nine different categories measuring motor patterns and rhythm flows. As a complete beginner to the KMP system, I found that the language within the KMP is extremely niche and hard to understand. Without the guidance and expertise of a certified KMP analyst, the written materials are hard to decipher based on one's ability. To become a KMP analyst, one must undergo extensive, time-consuming, and expensive training. Once one understands the KMP, it can be utilized for various populations and professions. It is not an exclusive DMT tool and could help non-DMT's understand the potential of movement analysis. To make the KMP more accessible, I would suggest advertising the KMP in a mainstream capacity and adjust some written materials, so they are easier to understand for those who are not adequately movement analysis savvy. There are a limited number of materials regarding the KMP and its validity and/or reliability that are deemed scientific or peer-reviewed.

The PDMS-2 is a motor assessment tool utilized within the early childhood community to assess gross and fine motor deficits in children ages zero to five. The test kit includes a

comprehensive manual, toys for tests, scoring sheets, and other forms to aid the process. The test takes about 60 minutes to administer, and it is suggested to be administered in a familiar environment of the child. There are no constraints regarding who can administer the test. The PDMS-2 has three domains: gross motor quotient, fine motor quotient, and total motor quotient. Each domain has subsets to measure specific motor skills, such as reflexes, stationary, locomotion, object manipulation, grasping, and visual-motor integration. The scores are gathered for each set and calculated to a mean of 100, and the standard deviation is 15. From a novice point of view, the information regarding the measurement of the PDMS-2 was easily comprehensible. Virtually anyone can administer the PDMS-2, which makes the assessment very accessible to a wider community. The negative aspects of the PDMS-2 are that the manual and other written materials within the PDMS-2 kit are in English, which limits the user pool to English speakers only to deliver the assessment to fidelity. The entire test costs around US$500, which is costly, to say the least. The test must be administered in a familiar environment to the child, which could become a limitation. The test is not designed for children with visual, audio, and/or physical impairments, and the original normed sample did not include children with additional needs. The normed sample is reflective of the 1997 U.S. Census data, which is more than 24 years old. This may not be an accurate reflection of the population today.

For future considerations, I believe there needs to be more information regarding the scientific approach of the KMP. Whilst comparing the KMP to the PDMS-2 regarding accessibility, I found that the validity and reliability information for the PDMS-2 was easily found, whereas the same information for the KMP was finite at best. In addition, most KMP articles are written by the same three authors: Susan Loman, Mark Sossin, and Sabine Koch. As a future DMT and KMP enthusiast, I would like to see digestible and multiculturally competent

material written by many more authors to provide a wide range of expertise and knowledge to the coming generations of KMP users. Further examination into the cultural diversity of the KMP is also necessary. In terms of future considerations of the PDMS-2, the normed sample needs to be revised and updated, as there may be a shift in the test-retest reliability and validity component of the assessment. As the normed sample is U.S. based, the results may vary with different cultures; nonetheless, the PDMS-2 manual and other written information should be translated into other languages to make the test globally accessible.

Conclusion

The KMP and the PDMS-2 are motorically oriented analysis and assessment tools utilized in a wide range of communities. Both systems have many merits; the KMP analyzes and notates our movement patterns and preferences, providing a comprehensive movement map for the analyst to use as they please, and the PDMS-2 assesses motor deficits for the early childhood population to address the need for early intervention. Upon comparing the two systems from an application, validity and reliability, and global application point of view, I conclude that both systems require an update. Learning about the KMP as a beginner was a tough battle, as it relies on complex language and theories, as well as niche movement concepts. The literature written about the KMP is hard to decipher for a first-time learner; perhaps there is an element of gatekeeping in that aspect. In the future, I hope to see plentiful diverse literature regarding the KMP, written with multiculturally competent, and novice-friendly points of view. The KMP has multitudes of potential to be utilized with a variety of professions, and I look forward to continuing my education regarding the KMP. The PDMS-2 on the other hand was easily digestible in terms of administration and delivery, however, it needs updates as well. The normed sample was not inclusive of physically diverse children, and the sample pool is outdated by more

than 20 years. It would be beneficial to update the normed sample reflecting recent Census data. The PDMS-2 kit needs a multicultural update including providing non-English language options for the written components and making the test more accessible to those with diverse needs, such as visual, audio, and/or physical impairments.

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THESIS APPROVAL FORM

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

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