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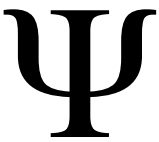

Dance as therapy:

An investigation of available evidence in the field of Dance/Movement Therapy, and plausible mechanisms behind potential effects

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Dance has always been a part of me. The idea behind this paper was a curiosity of weather something as abstract as dance could be united with the scientific field of psychology, as well as an interest in alternative treatment methods for those who are not able to engage in, or for some reason do not benefit from, verbal psychotherapy.

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Abstract

Several different treatment interventions use physical movement in order to enhance mental health. Among these is Dance/Movement Therapy. In this form of treatment, dance is used as a tool to integrate physical, cognitive, and emotional experiences. In this paper, questions are raised about whether Dance/Movement Therapy has any effect, and if so, for whom it has what effect, and what the underlying mechanisms may be. Loosely defined concepts and associations to non-scientific methods make the field rather bewildering. Nevertheless, this paper attempts to evaluate research in order to answer the questions mentioned above. Due to methodological flaws in many of the studies, no absolute conclusions can be drawn. Still, results from the reviewed research suggest that Dance/Movement Therapy might contribute to reduce anxiety and depression, enhance some aspects of physical function in certain patient groups, and possibly increase cognitive functioning among the elderly. Evidence of other effects, for instance on psychotic disorders and mental disorders among children, is not found. Various theoretical assumptions regarding underlying mechanisms are claimed among the practitioners of Dance/Movement Therapy, but minimal research is done to test these out. Despite this, possible underlying mechanisms are presented in the discussion, where the importance of more knowledge in this area is emphasized. In particular, more adaptive affect regulation is discussed as a possible mechanism through which dance therapy may enhance health.

Sammendrag

Mange ulike behandlingsmetoder benytter seg av fysisk bevegelse for å bedre mental helse. Blant disse er *danseterapi.* I denne behandlingsformen brukes dans som et verktøy til å integrere fysisk, psykisk, kognitiv, og emosjonell erfaring. Denne oppgaven tar for seg spørsmål om hvorvidt danseterapi har effekt, og i tilfelle for hvem det har hvilke effekter, og hvilke mekanismer som står bak. Løselig definerte begreper og assosiasjoner til uvitenskapelige metoder gjør feltet noe forvirrende. Denne oppgaven vil likevel evaluere tilgjengelig forskning for å forsøke å besvare de overfornevnte spørsmålene. På grunn av metodologiske problemer i mange av studiene kan ingen absolutte konklusjoner trekkes. Resultatene fra de gjennomgåtte studier kan likevel sies å gi en viss evidens for at danseterapi kan bidra til å redusere angst, minske depresjonssymptomer, bedre enkelte aspekter av den fysiske funksjonen hos noen pasientgrupper, og muligens øke kognitiv fungering blant eldre. Evidens for ytterligere effekter, på blant annet psykotiske lidelser og psykiske lidelser hos barn, er ikke funnet. Mange ulike teoretiske antakelser om bakenforliggende mekanismer er hevdet blant utøvere av danseterapi, men det er gjort lite forskning for å teste ut disse. Til tross for dette presenteres mulige bakenforliggende mekanismer i diskusjonen, hvor viktigheten av mer kunnskap på dette området vektlegges. Mer effektiv *affektregulering* drøftes videre som en mulig mekanisme som danseterapi kan virke gjennom for å ha en helsefremmende effekt.

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1.0 Introduction

It has long existed a belief that body and mind is connected, which is evident in the language. The Latin root of the word “emotion”, has a clear connection to movement. It stems from the word “movere”, *to move,* with the suffix “e”, meaning *out* (Callahan & McCollum, 2002). In spite of the deep roots that modern science has in Descartes' dualism (Devlin, 1996), there is now generally little doubt that bodily and mental processes are intricately intertwined (Damasio, 1998). Research has demonstrated a reciprocal relationship between motion and emotion as neurophysiologic correlates, whether it comes to muscular, attitudinal or psychological states (Berrol, 1992). There exist a wide array of psychotherapeutic treatments that in different ways draws on the assumption that mental states can be revealed and influenced through bodily movement. Some of these are 'character analysis' (Reich, 1972) and the closely related but wider field of 'body psychotherapy' (Stounton, 2002), 'psychodrama' (Moreno, 1946), and 'dance/movement therapy' (Ritter & Low, 1996; Stanton-Jones, 1992). This thesis will explore whether there is reason to assume that movement and dance as therapy has a positive effect on mental health. One mechanism through which these interventions might possibly work will be elaborated, this is through enhancing the ability to regulate affect. As efficient ability to regulate affect is seen as central to maintaining or achieving a good mental health (Bradley, 2003), it is reasonable to believe that any therapy that is efficient in terms of enhancing abilities to recognize and express affect, is an efficient treatment.

1.1 Characteristics of Dance

Dance is movement in a rhythmic fashion, but there are rhythmic movements that cannot be characterized as dance. For the movement to be called dance, it must be performed to express something, or convey an impression (Grönlund, 1991). In modern, western

cultures, dance is known as a performance art. However, dance is also used in all cultures, formally or informally, as a social activity. It can also have a ritual character, and has been used to celebrate for instance births, marriages, harvests, and wars (Sachs, 1937).

Literature suggests that dance can increase positive affect and decrease negative affect (Bartholomew, 2002), reduce anxiety (Leste & Rust, 1990), improve coping in cancer patients (Cohen, 1999) and relieve arthritis (Noreau, Moffet, Drolet & Parent, 1997). But little is known about which mechanisms are causing these effects. There are several important aspects in dance that separately may influence the dancer in different ways.

First of all, dance is a form of physical activity. There is evidence that physical activity not only enhances physical health and increase life expectancy, but also enhance life quality and reduce symptoms of depression and anxiety (Byrne & Byrne, 1993; Lane, 2001; Ommundsen, 2000; Stathopoulou, Powers, Berry, Smits & Otto, 2006; Taylor, 2006). Thus, research on the effects of dance will have to control for the general effect of physical activity in order to discover any additional effects.

Exercise intensity was not found to correlate with changes in affect in one study (Barthelomew, 2002). The author therefore attributes the affect to feelings of accomplishment or mastery, and claim that to master something new can enhance the sense of self, leading to a better self image, and possibly decrease negative emotions.

A central element of dance is rhythm. Rhythm is a common factor for several kinds of art therapies; music therapy, dance therapy and poetry. Research suggests that “the infant's sympathy arises from an inborn rhythmic coherence of body movement and modulation of affective expressions” (Trevarthen & Mallock, 2000). Rhythm has been believed to contribute to healing in many non-western cultures (Berrol, 1992), for instance African tribal dances (Hanna, 1978), as well as shamanic traditions among Indonesians, Australian Aboriginals,

North-American Indian, Alaskan Eskimos and South-American Indians (Moreno, 1988). Autonomic responses appear to adjust to external perception of rhythm (Snyder, 1972), and music may have a calming effect on the body (Berrol, 1992). In a study on rhythmic auditory stimulation and experience of "trance" the subjects was found to have increased levels of adrenaline, noradrenaline, and cortisol initially, only to quickly decrease below normal level. Levels of beta-endorphins were found to increase both during and after the trance experience, which might explain the reported feelings of euphoria (Goodman, 1986). Release of endorphins can help avoid pain sensation, and may also improve the immune function (Achterberg, 1985). It has further been suggested that rhythm can have a positive effect on health, being a necessary component in inducing "altered states of consciousness" (Woods, 2009), or help a person being conscious of the moment and experience "flow" (Csikszentmihalyi, 1990).

Another element common for art therapies is creativity. Creativity is associated with psychological traits such as openness, flexibility, and autonomy – traits that are seen as beneficial to one's mental health. It is suggested that increasing a person's creativity can possibly enhance mental health (Cropley, 1990). The author refers to a study by Krystal (1988) were it was found that extremely uncreative people had difficulties with self-care, and were lacking a sense of self-coherence. Some studies have tried to see whether practical creativity training in different ways can increase mental health (Schwarzkopf, 1981; Herrmann, 1987), and the results offer some support to this notion.

Last but not least, dance is often performed in groups, and can therefore include a social component as well. Synchronicity in movements may cause the dancers to experience some kind of connection, or belonging (Levy, 1988).

1.2 Dance As Therapy

Dance as therapy has its roots in dance as art, but has developed as an independent discipline (Berrol, 1992). In dance as an art form, aspects such as technique, choreography and aesthetics are important. Dancers work towards perfection in performance. In dance therapy the goal is rather to explore new ways of being and feeling, and so the focus is turned inward (Stanton-Jones, 1992). Aesthetic concerns are ignored, and the "nature [of dance] is explained in psychological, sociological and historical terms" (Payne, 1990). It is possible that dance in itself can be therapeutic, and several authors have attempted to distinguish "therapeutic dance" from "dance therapy", or "dance movement therapy" (Karkou & Sanderson, 2000; Meekums, 2002; Payne, 2006). The most important difference is the basic theory that lies behind dance therapy; namely that there is a powerful connection between motion and emotion. This principle is grounded in knowledge of child development (Payne, 1990). In therapeutic dance, choreography is used to evoke certain emotions or experiences, and aesthetic aspects can be of more or less importance, but quality of performance may be an aim as well. In dance therapy choreography is not seen as beneficial, aesthetics is ignored, and the aim is never to perform. Instructions may be given in order to promote movement with different qualities, but the degree of instructions given will in most cases be less than in therapeutic dance. In dance therapy self-initiated movement and spontaneous interaction is seen to be the key to explore and enrich the connection between physical and psycho-emotional factors.

1.3 Aim of the Paper

As mentioned above, there are several different psychotherapeutic techniques that use dance and/or movement as part of the treatment. This thesis will be narrowed to the concept of Dance Movement Therapy (DMT), as this is the approach that uses dance in the most direct manner, including all of the central characteristics of dance (movement, creativity,

rhythm, intonation). It is also a defined entity and a common term in the United States ("Dance/Movement Therapy"), and in Great Britain ("Dance Movement Therapy"); and some research has been done in order to evaluate the effect of this form of treatment. DMT was developed in the late 1940's (Grönlund, 1991), and is now being practiced with varying extent worldwide (Capello, 2008). DMT is used in many hospitals and institutions in order to enhance health in physically (Aktas and Ogce, 2005) and mentally ill patients (Pratt, 2004; Sandel, 1975), but still the approach is not clear-cut. The required amount of, and type of, education of the therapist, the structure of the sessions, and the goals for the treatment, varies a great deal. Research on the area is dominated by explorative, qualitative research, and the quantitative research that is done is often disturbed by small populations, short duration of treatment and follow-up, and lack of control over other variables.

The aim of this paper is therefore to explore what the health-enhancing mechanisms in dance therapy might be, if there are any. DMT is commonly considered to change affect, but little is known about the processes involved. Possible underlying mechanisms are therefore presented in a discussion, where the importance of knowledge in this area is emphasized. In order to narrow the scope of the discussion, one part of the paper will focus on the possible effect of DMT on *affect regulation*. Affect regulation is widely assumed to be central to mental health, and dysregulation is associated with many mental disorders (Gross, 1998). In sum, the objective of this paper is to investigate if there is any evidence available that dance as therapy can enhance the ability to regulate affect.

As mentioned above, the field consists of both qualitative and quantitative research. Qualitative studies are good methods for exploratory purposes, and for creating new hypothesis. However, for the purpose of evaluating evidence, as is the goal of this paper, quantitative studies are preferred. Hence, qualitative studies are excluded here. DMT is used

both as an individual intervention and as a group intervention. There are very few controlled studies on individual DMT. Therefore, the review will focus on quantitative research on DMT used as a group intervention.

2.0 Clarification Of Concepts

2.1 Dance Movement Therapy (DMT)

Dance movement therapy is one of the art therapies, seeking to combine the expressive and creative aspects of dance with the insights of psychotherapy (Stanton-Jones, 1992). In 1998, The American Dance Therapy Association defined Dance Movement Therapy (DMT) as «the psychotherapeutic use of movement as a process which furthers the emotional, cognitive, and physical integration of the individual» (Bojner-Horwitz, 1994). The Association for Dance Movement Therapy UK (ADMT UK) includes social integration too in their definition of «Dance Movement Psychotherapy», as well as highlighting the role of creativity. They define DMT as «the psychotherapeutic use of movement and dance through which a person can engage creatively in a process to further their emotional, cognitive, physical and social integration» (www.admt.org.uk, 2010).

DMT combines elements such as movement, emotional expression, social interaction, the use of symbol, metaphor, and narrative (Lumsden, 2006). The creative process of dancing freely is in itself seen as therapeutic.

Stanton-Jones (1992) have described the main principles of DMT, which mainly corresponds to what Karkau (2006) found reported in a survey among British DMT therapists. They can be summed as follows: **1) There is a reciprocal body-mind relationship.** How we move both influences and is influenced by how we feel. In DMT, emotional material is worked with in parallel to the physical material. Recognition of associations between the emotional and the physical is encouraged. Feelings can be identified, explored and expressed,

and pre-verbal experiences can be brought to consciousness. **2) Movement reflects aspects of personality and unconscious processes.** In this context, personality includes developmental processes, psychopathology, expressions of subjectivity and interpersonal patterns (Stanton-Jones, 1992) as well as inner conflicts (Siegel, 1995). The patients' feelings, expressed through movement, provide content and direction for the therapy, rather than the therapist laying the agenda. **3) Changes in moving facilitate changes in the state of mind.** Spontaneity and creativity enhances self-directed behaviour and choices, and may help relief habitual effort patterns. Increasing the movement vocabulary, with its corresponding psychological associations, is seen as facilitating a wider response to the environment (Payne, 1990). Free association in movement is also thought to be inherently therapeutic (Stanton-Jones, 1992). **4) The client-therapist relationship is essential.** This is true for all psychotherapy, but the way in which the relationship is established might differ. In DMT, synchronous movement is seen as an important factor in the development of the relationship (Levy, 1988). In the survey by Karkou (2006) a strong agreement (M = 4.2 on a scale from 1-5) was found among the respondents of the statement "Active interaction between two people is a key element for DMT". In group DMT, interaction between group members is also highly valued. Different dance styles are used in order to connect with different patients and different themes, or goals, in the therapy (Grönlund, 1991).

2.2 Regulation of Affect

It is hypothesized that well developed abilities to recognize, reflect on, and express one's own affect is associated with good mental health (Monsen and Monsen, 2000). These functions are viewed as necessary in order to achieve and maintain a coherent self. Information about one's affects can be used as meaningful information, and a motivating

force (Tomkins, 1979). If affect is not recognized and used as information, one will not be able to adapt to the environment in a constructive manner.

The concept of "affect regulation" is part of the broader concept of "self-regulation", and can be regarded as "a process involving reciprocal interactions between the neurophysiological, motor-expressive, and cognitive-experiential domains of emotion response system" (Taylor, Bagby & Parker, 1997, pp. 14). It includes processes on different levels, enhancing or decreasing, voluntarily or automatically, any affect experienced – positive or negative (Gross & Thompson, 2007). "Emotion regulation" is a slightly more narrow concept, and is defined by Gross (1998) as "how people influence which emotions they have, when they have them, and how they experience and express them". For the purpose of this study, the term "affect regulation" will be used. Emotion regulation is, however, seen as the most central part of affect regulation, in addition to regulation of mood.

In attachment theory, regulation of affect is assumed to "foster the emergence of self-regulation from coregulation" (Fonagy, Gyorgy, Jurist & Target, 2004). A link is suggested between affect regulation and attachment style (Cassidy, 1994), and it has been hypothesized that dysregulation is linked to psychopathology (Gross, 2007; Slade, 1999). A model has been presented of how all psychopathology has its origins in affect dysregulation (Bradley, 2003). It is argued that increasing the ability of affect regulation is one of the common factors contributing to change in all effective interventions. Different interventions deal with affect regulation in different ways, of course, but they all seek to improve the patient's capabilities to deal constructively with affect. For instance, if one knows how to deal with negative emotions, one will experience fewer prolonged states of stress, and the risk for psychopathology is lowered. In psychoanalysis affect regulation is associated with internal conflict. It is noticed by Fonagy et al. (2004) that in spite of partly different views on affect

regulation, both psychoanalysis and attachment theory sees affect regulation as a balance between positive and negative affects.

Children reporting symptoms of depression have been found to also use affect regulation strategies less, or using less beneficial affect regulating strategies, than non-depressed children (Garber, Braafladt & Weiss, 1995). The same association is found for adolescents (Kobak and Ferenz-Gilles, 1995). One of the traits characterizing persons with borderline personality disorder is emotional lability, and in treatment of these patients, increasing the ability of affect regulation is seen as an important factor (Fonagy et al., 2004).This does not necessarily mean that advantageous affect regulating strategies prevents psychopathology, or that disadvantageous strategies cause it, the associations may be more complex. However, there seem to be an association. Dysregulation of affect is in fact indicated in the descriptions of more than half of the axis 1 diagnoses in DSM-IV, and all the axis 2 diagnoses (Gross and Levenson, 1997). It is therefore reasonable to assume that increasing affect regulation in patients with various mental problems might decrease their symptoms.

3.0 Psychological Theories On Movement And Affect

The relationship between movement and emotion is relevant to several areas of psychology. In social psychology, one is concerned with non-verbal communication, and how this is used as social information (Aronson, Wilson & Akert, 2007). An important aspect of non-verbal communication is expression of emotion. Darwin studied facial expressions and hypothesized that non-verbal communication is “species-specific” and not “culture-specific”. Being able to communicate one's emotional states, as well as recognizing others' has survival value (Darwin, 1872).

It has been stated that “no-where are mind-body interactions more obvious than in the emotions” (Passer & Smith, 2000, p. 365). An emotional response, triggered by an emotional stimulus, includes a cognitive component, a physiological component and a behavioral component. These components are inseparable. Common sense is that we notice how we feel and then act according to it. James-Lange Theory of Emotion, also known as *somatic theory of emotion* (Papanicolaou, 1989) argues, on the other hand, that we know what we feel by noticing our behavior. Research do in fact show that the latter can be the case in some situations (Soussignan, 2002), although the different components are now considered to interact in a reciprocal manner. It is common to think of body posture, facial expression, and other non-verbal behaviors as consequences of a person's mental state, and so the therapist works with the mental content, hoping that the non-verbal behavior, and thereby the patient's appearance, will change along with it. Some theoretical and therapeutic approaches, however, focus on the idea that the movements, and interactions with one's environment influence mental development. Some of these, who have had an important influence on the development of DMT, will be presented briefly.

3.1 Wilhelm Reich and body-focused therapy

Wilhelm Reich expanded Freudian psychoanalysis in radical ways. In “character analysis” (1972) he describes how resistance towards therapy can appear in form of body language and physical tension as well as in verbal, spoken, information. He believed unreleased psychosexual energy could produce physical blockades in muscles and organs. Through studying the patients' psychosomatic expression, he wanted to reveal muscular tensions functioning as resistance, and break down what he called the “muscular armor”. He used breathing, and other techniques in his therapy, to mobilize body energies, and he might ask patients to change body positions and notice how that felt (Daniel, 2008). Thus, he was

working on two different levels, both the physical-muscular level and the verbal, psychoanalytic level Many body-focused therapies conducted today can be traced back to Reich, and his followers, with Alexander Lowen being the most well-known (Grönlund, 1991). Lowen's ideas of "bioenergetics" (1988) is a way of understanding personality through bodily energy and movement. The goal of the therapy is to help the patient to be in contact with his or her body. In order to achieve this, he used techniques such as breathing, movement, massage and self-expression. He believed that emotions such as stress, anger, and anxiety, as well as unconscious conflicts, are reflected in the body language. Awareness of one's muscular tensions can increase the patient's understanding of his or her emotions or conflicts, and the goal is to relive the suppressed emotions and tensions through movement. DMT therapists drew inspiration from these ideas.

3.2 Developmental Psychology

Developmental theory has had a strong influence on the development of DMT. Winnicott highlighted the importance of integrating the psyche and the body in order to acquire a true self. Play and creativity is seen as vital for a person's well-being, and for the development of the self (Winnicott, 1971). Stern described a rhythmic dialogue between the new-born and its caregiver, which is essential in order to develop empathy. Stern was inspired by research on mirror neurons and imitation, which supported his view of the infant's directedness towards intersubjectivity and the necessity for this "binding" to the caregiver for the child's emotional development (Hart & Schwartz, 2008). In DMT, the therapist seeks to create a "holding environment", or "intersubjetive room" so that the patient is free to explore and express affect, in the same way as the infant and it's caregiver. The dance is seen as a tool through which the patient can rediscover his or her "own capacity to imagine and fantasize, to generate experiences that feel deeply real, personal and meaningful" (Mitchell & Black, 1995,

p. 134). These experiences are seen as facilitating therapeutic change; just as the infant's experiences of holding, or binding to the caregiver, facilitate exploration necessary for the infant's emotional development.

4.0 DMT: Context And Applications

4.1 Art Therapies

«Expressive therapies» is defined by Cathy A. Malchiodi (2005) as «the use of art, music, dance/movement, drama, poetry/creative writing, play, and sandtray within the context of psychotherapy, counseling, rehabilitation, or health care». Thus «expressive therapies» is a slightly wider concept than «creative arts therapies», which according to the National Coalition of Creative Arts Therapies Associations (2004) only includes art, music, dance/movement, drama, and poetry/creative writing. What separates art as therapy from art in general, is whether the focus is on the product, or on the prosess in itself (Dalley, 1984). In general art the focus is on the product, while in art as therapy the focus is on the process.

The idea of using the arts as treatment is an old one (Malchiodi, 2005). It is said that the Egyptians, as early as 500 B.C. encouraged people with mental illness to engage in creative activity, such as attending concerts and dances (Fleshman and Fryrear, 1981). In the Bible, King Saul claimed finding healing in David’s harp music, and the Greeks used music and drama “to help the disturbed achieve catharsis, relieve themselves of pent up emotions, and return to balanced lives” (Gladding, 1985, pp. 2). The “catharsis theory”, however, has not been supported by empirical evidence, in fact several studies have found contradicting evidence (Bushman, 2002; Geen & Quanty, 1977; Warren & Kurlychek, 1981). But regardless of the different theories that was used to explain any effects, it is interesting that many of the ancient cultures, or their healers, “thought that there were power in the arts” (Gladding, 1992, pp. 3). In the middle of the 1900’s the term “art therapy” was used by

several health professionals to describe their work (Malchiodi, 2003). At this time there was a movement in the field of psychiatry towards giving mental patients a more humane treatment. Art therapies became an important part of "moral treatment"(Malchodi, 2005).

4.2 The History of DMT

In the beginning of the 20th century, formal dance in the western world was dominated by classical ballet, which follows a strict regime. Isadora Duncan, Martha Graham and Doris Humphrey are some of the pioneers of the early modern dance, who valued themes such as spontaneity, authenticity of expression, and body awareness (Wahlström, 1979). They in turn inspired Marion Chase, who started to use dance therapeutically in the treatment of schizophrenic patients. As Sullivan and Fromm-Reichmann's innovative ideas started to transform traditional psychiatric practice, it became possible to use dance as part of the treatment (Stanton-Jones, 1992). Marion Chace later founded The American Dance Therapy Association in 1966. Kristina Stanton-Jones stated that "DMT would have been unthinkable without the artistic and choreographic ideas that ventred on direct emotional expression and abandoned formalism" (1992, s. 12). Rudolf Laban was an Hungarian dance artist and theorist who was especially known for his work in the UK. He categorized movement in a systematic manner, so that it was possible to use movement observations for assessment and diagnostic evaluations. His theories led his students and others to promote the use of dance and movement in therapeutic contexts (Payne, 1990).

In the same time period, there were also new developments in psychotherapy, and several psychologists showed interest in nonverbal aspects of psychology and psychopathology. In Darwin's work, "The Expression of the Emotions in Man and Animals" (1872), the nature of facial and bodily expression was explored from an evolutionary point of view. Eugen Bleuler in Switzerland, Jean-Martin Charcot in France and Henry Maudsley in

England observed psychiatric patients' movements and gestures in hope that they would be able to develop clear diagnostic criteria to predict the course of these patient's diseases (Stanton-Jones, 1992). Also other disciplines than psychology, such as anthropology, linguistics, and social sciences also took up an interest for nonverbal behavior, and the work in this area has become more specific. The aspect of movement analysis that is taken as a focus in DMT is the movement's "qualitative, expressive, psychological aspect" (Stanton-Jones, 1992, p. 60).

Psychoanalytic ideas gained huge popularity in the first half of the twentieth century, and their ideas also influenced the development of DMT. Especially the notion of the unconscious material that can be discovered through dreams, free association, or slips-of-tongue, led dance therapists to hypothesize that dance and movement, as well, can be a "royal road" to the unconscious (Penfield, 1992). The humanistic psychology movement of the 1950's and 1960's also played a part in the development of DMT (Dosamantes-Alperson, 1974), as did new knowledge of group therapy.

Karkou and Sanderson (2000) interviewed dance movement therapists in UK, working in education (N=16) and elsewhere (N=25). The theoretical influences that was reported by most therapists was the work of Winnicott, development theories, object relations theory, play therapy, specific DMT traditions, Bowlby's theory of attachment, Jungian symbol work, psychoanalytic theory, humanistic approaches, and client-centered therapy. Less important influences that were reported were specific dance traditions, group analytic theory, integrative approaches, eclectic approaches, Kleinian theory, Gestalt therapy, and Behavioral therapy.

4.3 Areas of Application

The training on non-verbal attunement is extensive in DMT. Lumsden (2006) argues that this is exactly what is needed in treatment of patients with complex trauma, where the

basic affect regulation mechanisms may be deficient. It is also reasonable to assume that when a person has physical complaints and distress caused by somatic changes, a somatically-oriented approach to psychotherapy can have a positive impact (Goodill, 2006).

DMT has in fact been used in work with traumatized patients (Gray, 2001; MacDonald, 2006; Meekums, 1999; Mirro-Finer, 1999; Moore, 2006; Thulin, 1999) and physical complaints like fibromyalgia and medically unexplained symptoms (Fersh, 1982; Mannheim & Weis, 2006; Payne, 2009). It has also been used extensively in the work with elderly patients (Fersh, 1982; Grönlund, 1991; Nyström, 1999; Kindell & Amans, 2003), with psychotic and schizophrenic patients (Helgesson, 1999; Oganesian, 2008; Xia & Grant, 2010), people with eating disorders (Härkönen, 1999; Krantz, 1999), prison inmates dealing with violence and addiction issues (Goodison & Schafer, 1999; Milliken, 2008), children and adults with different kinds of developmental disabilities (Grönlund, 1991; Persson, 1999), children with behavioral and relational problems (Capello, 2008; Grönlund, 1999), child survivors of war and torture (Capello, 2008), and also with children in regular education (Harvey, 1989; Hervey & Kornblum, 2006). In the last 15 years DMT has also been used to reduce stress and anxiety associated with chronic diseases (Goodil, 2006) and cancer (Cohen and Walker, 1999; Rainbow, 2005). Because it uses non-verbal interaction it is suggested that this treatment is especially efficient for patients whose capacity to engage in a strictly verbal therapy is limited (Sandel and Johnson, 1983).

Not only has DMT been applied to a wide range of areas, but it is also practiced in several different ways. The treatment can be offered in groups, or in individual sessions. The psychotherapeutic orientation of the therapist can vary between psychodynamic, Jungian, ego-psychoanalytic, Gestalt, or humanistic (Stanton-Jones, 1992). Different kinds of dance are used in the interventions. Improvisation is most common, but other dance styles have been

used, such as ballroom dance, African dance, modern dance, and circle dance. Also, the degree of professional training varies among dance movement therapists, as does their way of structuring the treatment. Most programs include some time at the end of each session to discuss verbally the experiences the participants have had during the session. Some therapists value this as an important part of the intervention, contributing to integrate non-verbal experience with verbal knowledge. However, as there are no known standards for this, it probably varies how this part of the session is used: what is discussed, for how long, and how open the participants are encouraged to be. Most dance movement therapists uses a rather eclectic approach, adjusting the theoretical approach, the dance style, and the program, to the particular patient(s) and the current goals of the therapy (Grönlund, 1991).

4.4 What Are the Factors in DMT Treatment That Are Assumed to Promote Change?

Several factors are suggested by DMT practitioners to be responsible for positive changes due to DMT. One such factor is the relationship to the therapist, and the experience of receiving unconditional positive regard. In DMT, this experience is assumed to be induced through processes such as synchronous attuning and mirroring (Bunce, 2006). Many DMT therapists work with transference. Some also point to the containing function of the group, and the experience of acceptance from the group. Group rhythm, synchrony, and vitalization is believed to promote change (Schmais, 1985).

Furthermore, it is suggested that DMT help the patients to "create symbols that represent emotional experiences" (Bojner-Horwitz, Theorell & Anderberg, 2003, pp. 255) and that this process can bring to consciousness suppressed emotions, and help the patients deal with these. Expressing emotions is a central part of DMT, and the idea of letting go of emotional tension through cathartic experience is strong among at least some practitioners (Bernstein, 1995). The use of catharsis is often thought of as a means to give the patient an

experience of mastering overwhelming emotions (Baum, 1995). Fletcher (1979) however admits that releasing negative feelings or tension may, if it is too explosive, further disorient the patient, instead of the opposite. She therefore states that this process must be followed by therapeutic work in order to gain insight into these feelings. Verbal processing of the experiences one has while moving, is seen as a way of integrating verbal and non-verbal experiences (Levy, 1988).

The idea that movements associated with specific developmental states may evoke preverbal experiences is held by many practitioners (Karkou, 2006; Kestenberg, 1975; Siegel, 1995), and is in fact supported by research demonstrating how postures congruent with earlier autobiographic memories facilitated these memories (Dijkstra, Kaschak & Zwaan, 2007). A widespread principle in DMT work is that changes in movement patterns give new emotional experiences. Since we know that bodily feedback can influence the mental state (Berrol, 1992; Koch, Holland, Hengstler & Van Knippenberg, 2009; Reisenzein, 1983), it is not unreasonable to assume that moving in unfamiliar ways may trigger unfamiliar emotions.

It is assumed that a focus inwards will facilitate authenticity and lead to acknowledgment of ones emotions, and that experiences with awareness and breath promotes a greater sense of control over the body (Erwin-Grabner et al., 1999;). Achieving greater control over the body through DMT is assumed to be associated with less helplessness and anxiety (Bojner-Horwitz, 2004) as well as mastery (Erwin-Grabner, Goodill, Hill, & Neida, 1999; Levy, 1988).

Another way DMT is assumed to benefit patients is through increasing social skills. The theory is than that DMT gives a better understanding of non-verbal communication, which will increase social skills (Bunce, 2006). DMT also creates an atmosphere for

exploration of social interaction (Ritter & Low, 1996). Learning to take initiative and make choices in a safe environment is assumed to transfer to other arenas in life.

5.0 Research On DMT

Research on dance therapy has mostly been qualitative and exploratory clinical reports, and in some cases the researcher is also the therapist. In spite of a negative attitude toward quantitative, empirical research among some dance movement therapists, there is now an increasing acceptance for the importance of research in the field (Berrol, 2000). Although there exists a discussion about whether traditional (quantitative) research on DMT is the most appropriate methodology (Meekums & Payne, 1993), it seems to be widely accepted that research is crucial for further development of DMT: "Attention to research will allow dance/movement therapy to play a more prominent role in the multidisciplinary team dance, and to claim a greater share of health care resources" (Higgins, 2001, p. 195). Indeed, quantitative research in the area has increased in the last 30 years, and some results are, if not convincing, promising.

A meta-analysis on the effect of DMT was published by Ritter and Low (1996), where 23 studies were included. Fourteen were between-subjects designs, comparing dance therapy (DMT) treatment groups with controls, and nine were within-subjects designs, comparing pre- and post-treatment measures. The authors state that the research on DMT has plenty of methodological problems. First of all, the within-subject design is problematic, as it does not control for maturation or specific events, neither for the placebo effect. Also among the studies that was included in the meta-analysis, three studies (Boswell, 1993; Mattes et al., 1986; May, Wexler, Salkin & Schoop, 1974) used measures that had unknown reliability and validity, some did not mention whether participation was voluntary or not, and in some studies the participants probably received additional treatment. But still, the authors conclude

that the available research suggests that DMT may be an effective treatment for patients suffering from a range of symptoms. Specifically, the treatment seems to be effective for anxiety (r = .70), and the results are more optimistic for adults and adolescents than for children (r = .29). For measures on changes in self-concept (how the participants viewed themselves), they found a relatively low effect size (r = .27), and assumes therefore that DMT in itself does not affect the self-concept. Some of the studies measured effect on body awareness. The results here indicate a modest effect (r = .34), but are inconclusive, mainly because several of these studies used projective tests with low reliability (Ritter & Low, 1996).

Cruz and Sabers (1998) identified a problem with Ritter and Low's treatment of effect sizes that may have underestimated the effect of DMT. They also compared the results of the meta-analysis to meta-analysis of alternative treatment methods, like cognitive-behavioral therapy, medical meditation techniques, exercise, and medical treatment, and found that the range of the results from DMT treatment (effect sizes between .15 and .54) is quite comparable to other treatment modalities. This led Low and Ritter to publish a letter in response, taking the methodological problems into consideration and concluding that «both psychotherapy and DMT appear to produce measurable improvement in participants» (Low & Ritter, 1998, p. 107). Unfortunately, since 1996 there have been done onlt a few quantitative studies on DMT. These, plus a few of the studies included in this meta-analysis, will be reviewed thematically. All studies mentioned in this section is shown in table 1.1.

5.1 Anxiety

The effect of modern dance on anxiety in a healthy population was investigated by Leste and Rust (1990). This was one of the first studies attempting to control for alternative causes for improvement, such as physical activity. They compared the effect of attending a

modern dance group with attending a physical education group, a music group, or a mathematics group, on anxiety. Thus, the effect of exercise and music, or aesthetic appreciation, plus the placebo effect of attending a group at all, was controlled for. The participants (n=84) were students, and the courses were integral parts of their studies. They were tested with a battery of tests in the fourth week of their first term. Post-testing for anxiety was done in the middle of the second term. Analysis of variance of the pre-test scores showed no significant differences between the groups on neither state- or trait-anxiety measures. On post-test scores they found that anxiety levels in the modern dance group was reduced significantly, but not in any of the control groups. Since there was only one group in each category, what one can conclude is only that at least in these specific groups, «effects of music and physical exercise alone are less than when they are combined in dance» (p. 6). Also, one can not be sure whether preexisting differences between the groups influenced the results. The preexisting groups were measured on variables such as sex, age, attitude towards dance, previous experience with sports, dance, and relaxation, and the results indicated that the results could not be accounted for by any of these factors. Still, less obvious differences between the groups might have been influential.

One pilot study investigate the effect of DMT on test anxiety (Erwin-Grabner et al., 1999). The participants were randomly assigned to intervention group (n=11) or control group (n=10). They used Test Attitude Inventory (TAI) to measure whether self reported test anxiety was reduced in the intervention group compared to the control group, and found that it was reduced significantly ($t= -2.01$, $p= 0.030$). However, the control group in this study did not receive any treatment, so the results does not say anything about DMT treatment compared to other interventions.

A few studies on psychiatric patients have also shown reduction in anxiety due to DMT (Brooks & Stark, 1989; Kline et al., 1977). These were included in the meta-analysis by Ritter and Low (1996).

5.2 Biological markers and depression

Various outcomes of female fibromyalgia patients receiving DMT were compared with the outcomes of a control group (Bojner-Horwitz, 2004). The total number of participants was 36, and they were randomly divided in a target or a control group. The target group received DMT for six months. For both groups hormonal, emotional, and physical changes were measured. Biological markers measured were serum concentrations of hormones (prolactin, dehydroepiandrosterone sulphate, cortisol, and neuropeptide Y) in plasma and saliva. According to visual analysis and participants' self-reports, both physical and psychological function was increased in the target group during these six months and eight months later. But the groups did not differ significantly in depression as measured with Montgomery Åsberg Depression Rating Scale (MADRS; Montgomery & Åsberg, 1979), nor in the hormonal measures. The author suggests that the biological markers measured would need a longer treatment period for a significant effect to appear, with regard to the long duration of the participant's illness. However, this is an interesting study because it is the first study to include biological markers in the evaluation of outcomes from DMT.

A Korean study also included biological markers in evaluating the effect of DMT on mild depression in adolescents (Jeong, Hong, Lee & Park, 2005). In addition to self-report measurement (Symptom Check List; SCL-90-R; Derogatis, 1977), they measured plasma concentration of cortisol, serotonin and dopamine in a DMT-group (N=20) and a control group (N=20). Results showed an increase in plasma serotonin concentration and a decrease in dopamine concentration in the DMT-group, and not in the control group. Cortisol

concentration did not change significantly in any group. The results of SCL-90-R indicated improvement in negative symptoms in the DMT-group, and the authors suggest that modulation of serotonin and dopamine production might be the mechanism responsible for the reduction in depression. This study has less confounding variables than most research on DMT, as there were strict exclusion criteria, for example the fact that none of the participants could receive any parallel treatment. The treatment period was also longer and more frequent than in most studies. However, as the control group received no treatment, the expectation effect was not controlled for, as was not the effect of engaging in social activity nor physical exercise alone.

In another study, a group of depressed, older adults received ballroom dance lessons as a treatment for geriatric depression (Haboush, Floyd, Caron, LaSota & Alvarez, 2006). Participants were randomly assigned to an immediate or an delayed treatment group. Parallel treatment and comorbidity was controlled for. Results showed medium effect sizes for measures of depression, but the population was too small to detect a significant effect of the dance lessons. The authors mention being active, engaging in a new activity, and interacting with others as factors that might have caused the effect. It is noteworthy that in this study general mental health (as measured by SCL-90) was not increased as much as the measures specific to depression. This may be because depression was the main problem of the participants, or it may indicate that such a treatment has a specific effect on depression. They also found in this study that self-efficacy was a predictor for positive development, while hopelessness on the other hand predicted worse outcomes.

Classes receiving African dance or Hatha Yoga were compared in terms of changes in affect and changes in cortisol (West, Otte, Geher, Johnson & Mohr, 2004). Results indicated that both classes reduced perceived stress and negative affect, as compared to a biology class

where no change occurred. Further analysis showed that changes in cortisol and changes in positive affect was negatively correlated in yoga, but positively correlated in African dance. The participants of this study were already enrolled in their respective classes, which makes it probable that personality characteristics may have biased the choise of class and therefore the results. Still, it indicates that different body and movement focused interventions had similar psychological effects.

Thirty-one psychiatric patients with a main or additional diagnosis of depression was divided into three groups: a dance group with music, a music-only group, and a movement-only group (Koch, Morlinghaus and Fuchs, 2007). The latter used ergometer bikes, and the intensity of the exercise was the same as for the dance group. The dance group with music showed significantly less depression on the posttest, and significantly more vitality compared to the music-only group. However, it should be mentioned that dancing was not the only factor exclusive to the intervention group. The intervention group included more interaction with the rest of the group and more of a cognitive challenge than did the control groups, factors that might have affected the results. However, these factors are integral parts of DMT and can hardly be excluded.

Two pilot studies carried out by Kuettel (1982) showed that attendants in a single dance therapy session reported to experience more affect than did participants in a control group participating in regular student activities, and participants receiving group therapy. More confidence was reported, as well as less feelings of depression and anxiety, but also more feelings of inhibition, anger and somatic distress.

It can also be added here that Koch (2006) reported from the 2nd International Research Colloquium in Dance Therapy, findings by Gunther and Hölter (2006). This was an evaluation of an intensive DMT treatment for 2-3 months with 45 depressed patients, and

positive results are reported on the dimensions of movement and well-being, body- and self-perception, perception of relationships, and perception of one's biography. Details, however, unfortunately are not available as there is no known English publication of this evaluation.

5.3 Psychosis

Even though descriptive studies claim to have found improvements in hospitalized psychiatric patients due to DMT (Chace, 1953; Heber, 1993; Sandel, 1975), quantitative, controlled studies have not given the same results. Much of the research on psychiatric patients build on tests in which reliability and validity is not well documented, and are afflicted with confounding variables such as parallel treatments, medication, and heterogeneity of diagnoses, which perhaps can partly explain the results (Ritter & Low, 1996).

Brooks and Stark (1989) found statistically significant changes in depression and anxiety, as measured by Multiple Affect Adjective Check List (MAACL; Zuckerman & Lubin, 1965) in a group of psychiatric inpatients after a single session of DMT, compared to a no-treatment control group. This indicates possible psychological effects, at least temporarily, in psychiatric patients.

The mentioned meta-study by Ritter and Low (1996) included two quantitative studies evaluating the effect of DMT for schizophrenic patients. One of them, (Christup, 1974), had a population of 54 and included a control group, but used tests relying on human figure drawings (the Goodenough Scale and the Swensen Sexual Differentiation Scale) whose reliability are not very well documented (Weiner, 1966). Between-group comparisons were not statistically significant. The second study (May et al., 1974) used interview-based ratings by psychiatrists and nurses, and compared outcomes in the DMT group with outcomes in a music therapy group. This study, including 38 subjects, did not indicate improvements due to

DMT. A Cochrane review on dance therapy on schizophrenia was carried out recently (Xia & Grant, 2010), and found no evidence to neither support nor refute the effect of dance therapy with schizophrenic patients. The data were inconclusive due to a small sample.

5.4 Physical Measures

Some studies have indicated positive physical effects of DMT. One study evaluated the effect of DMT on patients with Parkinson's disease, and found improvements in speed of walking in the treatment group, but not in the exercise group which was used as a control group (Westbrook & McKibben, 1989).

A increased range of motion due to DMT is found in patients with rheumatoid arthritis (VanDeusen & Harlowe, 1987). This study compared the DMT program (n=17) to a traditional exercise and rest program (n=16) and did a follow-up four months after ended treatment. The results showed significant differences between the groups in favor of the DMT group on upper extremity range of motion on the follow-up, although the frequency of exercise was higher in the control group. Another study (n=107) also used a treatment-as-usual group as control group (Berrol, Ooi & Katz, 1997), and found indications that elderly with neurotrauma benefited from DMT, in terms of statistically significant improvement ($p = < .05$) on some aspects of physical function (such as balance while walking sideways and backwards, and one item measuring range of motion), but not in other aspects (such as spatial orientation, motor planning, and reaction time). A study with visually impaired children demonstrated significant improvement in muscle control, balance, and spatial awareness (Chin, 1988); and children with mental retardation was shown to have a significant increase in dynamic balance skills after 12 weeks of DMT compared to a traditional gross motor program (Boswell, 1993). However, a study with mentally retarded children indicated no improvement on motor performance, body awareness, or self-concept (Kavaler, 1974). The failure to

demonstrate significant changes in this study may possibly have been influenced by a "ceiling effect" (Ritter & Low, 1996).

Survivors of breast cancer were given a 12 weeks DMT intervention in order to determine its effect on life quality and shoulder function in this population (Sandel et al., 2005). A waiting list group served as control group, and there was a crossover after 12 weeks so that the control group received the same 12-week intervention from week 14 to 25. Both groups were tested in week 1, 13 and 26. The intervention group showed a significant increase in a breast-cancer-related measure of quality of life (Functional Assessment of Cancer Therapy – Breast Cancer; Brady et al., 1997) compared to the wait list control group, as well as 7° greater shoulder range of movement (ROM) than the control group. Statistical significance of the change in shoulder ROM could not be determined due to large variability. Similar improvements were found for the control group at the crossover period. At week 26, the intervention group maintained the high scores on the quality of life measure, which indicated a lasting effect. The authors still rise the question of why the improvement happened: to what degree the effect was due to actual movement, to music, to the discussion after each session, to expectations, or to having an enjoyable experience and a feeling of participation. There is no way to determine which factors are of more importance in this study and which are of less. This is a general problem which will be elaborated in a later section of this paper.

A Cochrane review on «Dance movement therapy for improving psychological and physical outcomes in cancer patients» is still on protocol stage, and will be published later this year.

5.5 DMT with Children

Research on children with mental retardation (Boswell, 1993; Kavaler, 1974), visual impairment (Chin, 1988), and a study with depressed adolescents (Jeong et al., 2005) are reviewed above. The results from the studies with children with mental retardation indicated respectively, some improvement in dynamic balance skills (Boswell, 1993), and no significant improvements in motor performance, body-awareness, or self-concept (Kavaler, 1974). The study on visual impairment found significant improvements on muscle control, balance, and spatial awareness. The study with depressed adolescents (Jeong et al., 2005) found changes in serotonin and dopamine concentration due to DMT, as well as a decrease in symptoms of depression, as measured by SCL-90-R. A study of eleven children with varying psychological and physical disturbances (Wisloshi, 1981) was included in the meta-study by Ritter and Low (1996). Significant changes in attention, participation, and relaxation, was found. Though, it is noted that the reliability of the measurement used is not reported.

Some more recent research has focused on DMT programs incorporated in schools. Two studies of which include 56 and 54 children respectively, will be reviewed here. The first is an evaluation of a DMT program designed to prevent aggression among children: "Disarming the Playground" (Kornblum, 2002). It was evaluated in a controlled study (Hervey & Kornblum, 2006) including second grade students with a high percentage of "at risk children", and children with special needs. As this is a practice-based evaluation, it studied the program as it actually was implemented, and did not select random samples. This means that a lot of environmental factors was not controlled for. But the results, however, can be said to be more generalizable to programs implemented in similar school systems. The children were assessed with Behavior Rating Index for Children (BRIC; Stiffman, Orme, Evans, Feldman & Keeney, 1984) at the beginning and in the end of the school year. Results showed statistically significant changes in the scores of 87.5% of the children, where 76.79%

of these changes refer to decreases in problematic behaviors. However, this was a specially designed program for preventing, or decreasing aggression, and the children was taught specific skills of how to deal with upsetting situations. Their parents also received monthly letters so that the children could practice the skills at home. Due to the lack of control groups, it is especially difficult to know whether the improvement in behavior was influenced by the dance and movement, or by the explicit presentation of skills, the school's focus on aggression prevention and rehearsal of the skills at home.

The second violence prevention program, called PEACE, was evaluated by Koshland, Wilson, and Wittaker (2004). This was a 12-week DMT-based program focusing on socialization and problem solving experiences. In addition to movement, children's stories and discussions were also used in order to introduce pro-social behaviors. 1st, 2nd and 3rd graders, who received DMT, was found to have a greater decrease in aggressive incidents than did 4th, 5th and 6th graders, who did not receive DMT. The fact that the control subjects was not in the same age group is problematic because one can not know whether younger children simply change more because they are more susceptible to change. Another weakness of the evaluation of the two programs is the fact that the teachers were not blind to the hypothesis, as everyone knew that the programs were directed at reducing aggression. One can imagine changes in the way the teachers behaved towards the children, as they perhaps were aware of the importance of reducing aggression. Perhaps the changes can even be attributed to the “Rosenthal effect”: The greater expectations to the students, the greater they perform.

A pilot study (Meekums, 2008) was designed to study the effect of individual DMT with children on “emotional literacy” (EL), which in this study was used as a collective term for the following aspects: Expression of emotions, self-esteem, and social function. The

author found that each child (N=6) had increased skills in at least one of the three aspects. As this was a pilot study with only a small sample and many methodological weaknesses, no conclusions can be drawn from it.

5.6 DMT in Geriatric Care

107 elderly patients with non-progressive neurotrauma received either DMT, or treatment as usual (Berrol et al., 1997). In addition to certain aspects of improved physical functions (reviewed above), the results also indicated improvements due to DMT in cognition, as measured by Cognitive Performance Scale (CPS), and in social interaction, as measured by part of the Minimal Data Set (MDS). No improvements in depression were found, but as clinical depression was non-existent in the majority of the participants, the measure used for depression, Geriatric Depression Scale (GDS), was probably not a relevant measure.

Another study (Hokkanen et al., 2008) revealed small, but significant improvements in the scores of Mini-Mental State Examination (MMSM; Folstein, Folstein & McHugh, 1975), measuring cognitive status, as well as some improvements in self-care abilities, among patients with dementia. This study included random recruiting from a nursing home, random assignment into treatment or control group, double baseline, and a follow-up. The treatment group also improved significantly at post testing in a task of visuospatial ability and planning, but not at follow up. Changes in memory were not detected. The authors conclude that the changes were small, but having effect on cognition and self-care abilities, DMT should be considered as a treatment option in treating dementia.

Patients with Parkinson's disease (PD) were recruited from a treatment center, and received either tango or physical exercise classes (Hackney, 2007). Healthy individuals in the same age group receiving the same intervention, namely tango or physical exercise, were used as controls. After 20 sessions, statistically significant differences were found between those

with PD in the tango group and those with PD in the exercise group, with those in the tango group showing more improvements in measures of falls, gait, and balance confidence.

5.7 Body Awareness, Body Image, and Self-Esteem

Body image is assumed to be shaped by representation of physical appearance and bodily experience, and thereby closely related to self-esteem (Lewis & Scannell, 1995). Movement is seen as relevant because, as one moves, shifts in body perception occurs, and it gives information about the relationship between different body parts (Schilder, 1950). Statistically significant differences were found in measures of "body scheme" between a treatment group and a non-treatment group consisting of elderly patients with neurotrauma (Berrol et al., 1997). The authors explain the concept "body scheme" as "an internal map of the body or the inner awareness of the body parts and how they move" (p. 144), and the concept is measured by the following items: Tactile Localization, Body part awareness, imitation of postures and identification of body parts. Several other studies suggest improvements in *body awareness* (McCarthy, 1973; Ohwaki, 1976) but none of them included control groups.

In a study with mentally retarded youth (Franklin, 1979) results indicated more improvement in *body image* among subjects in a DMT group than in a physical education group. Van Deusen & Harlowe (1987) compared outcomes from a DMT group with outcomes from a treatment-as-usual group, and found that the DMT group improved significantly more than the control group in terms of body image. Silver (1981) found evidence that participants saw their bodies as more graceful, fast, active, strong, and beautiful after participating in DMT. Changes in self-concept have also been measured among forensic psychiatric patients (McConnell, 1988) where a low effect size was found; and among alcoholic women (Reiland, 1990), where effect size was high, but the population very small (N=3). Many of the studies

on body image mentioned above (Franklin, 1979; McCarthy, 1973; McConnell, 1988; Ohwaki, 1976; Reiland, 1990) used projective tests, which according to Ritter and Low (1996) "often produce non-significant results due to individual variability and low reliability" (p. 257). Another study failed to statistically differentiate between changes in treatment group and control group, as both groups had an improvement in body image (Sandel et al., 2005). The subjects were cancer patients who, at least one month earlier, had undergone breast surgery. The improvement could strictly be due to post-surgery recovery.

Questionnaires were given to 112 women who had participated in creative dance movement courses for periods ranging from two weeks to 16.5 years (Lewis & Scannell, 1995). The women who had participated for five years or more, reported being more satisfied with their bodies and appearance than were the women who had participated for less than five years. There were no differences between the groups with respect to physical exercise other than dance, and differences in Body Mass Indices were not found to be clinically significant. Still, one cannot exclude the possibility that the more experienced group felt better about themselves initially. The study implies therefore nothing about cause and effect, or about the direction of the association.

Self-esteem, as measured with Rosenberg Self-Esteem Scale, was found to increase in a group of cancer patients during 6 weeks of DMT treatment (Ho, 2005). The effect size for self esteem was estimated as medium (.46), but no statistical significance was found, probably due to a small sample.

The related concept of "self-actualization" was operationalized by six aspects: inner-directedness, existentiality, feeling reactivity, spontaneity, self-acceptance and capacity for intimate contact (Dosamantes-Alperson and Merrill, 1980) and measured by Personal Orientation Inventory (POI: Shostrom, 196 6). Results showed that the two experimental

groups differed significantly on all six scales from the control groups, which consisted of a ballet group and a waiting list group. As the participants were students who volunteered for the project, there may be a self selection bias. However, the waiting list control group would control for that. Likewise, the ballet class control group would control for the effect of simply being part of a group, and of physical exercise. The fact that these two control groups did not differ significantly on either pre-test or post-test scores, as neither did the two experimental groups, increases the credibility of the results, which indicated increased self-actualization due to DMT.

6.0 Discussion

This paper has presented relevant research on DMT. It will now attempt to sum up thematically the implications of the presented studies, as well as the main tendencies in the different areas of research. Some suggestions for further research will be included.

6.1 What Does Available Evidence Suggest about Effects of DMT?

Quantitative research yields a possible effect of DMT on anxiety. But how effective this intervention is compared to other interventions or treatment methods remains unclear.

Some results for depression gives room for optimism, but they are not unambiguous. Many of the studies on depression does not control for the effect of physical exercise and engagement in a social activity, which both may be influencing mood. These factors are inherent parts of DMT, and it can be argued that isolating them makes no sense, as the purpose is to measure the effect of DMT as a integrated whole. The problem with not controlling for them is, however, that the same factors are also inherent in other activities, like regular dance or exercise classes. Therefore, controlling for these factors makes it possible to determine whether subjects benefit significantly more from DMT than they would from *any* group activity including physical activity. Some studies also failed to control for self-selection

bias, which means that the effect could be connected to preexisting characteristics in the participants. For instance, one study (Haboush et al., 2006) found indications of self-efficacy as a predictor of DMT treatment effectiveness. Further research could establish whether self-efficacy, or other factors such as motivation, are required in order for the treatment to be effective. Excluding self-selection bias is a problem for most psychotherapy research, as random sampling is both difficult to carry out, and includes ethical concerns.

There are some indications in the literature that hospitalized psychiatric patients can benefit from DMT in terms of group cohesion, release of depression or anxiety, or decrease of isolation. However, only a few studies have investigated specific groups of psychiatric patients. There are up till now no convincing evidence of symptom release for psychotic or schizophrenic patients.

When it comes to physical improvements due to DMT, positive results are found for specific aspects of physical functioning in specific patients groups. Other physical functions have not been found to improve. The positive findings therefore need to be scrutinized by testing the same specific function in several groups, or in larger samples, in order to check these results and be able to draw conclusions from them.

Research do offer some support for multimodal interventions, including DMT-based programs, for aggression-prevention in schools, but these are not yet compared to other aggression prevention programs. DMT among children with physical disabilities indicate some improvement in some aspects of physical functioning, but not in other aspects. Studies including children with psychiatric disorders have hardly been carried out at all.

Results from research on DMT in geriatric care indicate a small effect on cognitive functions, and possibly on social interaction and self-care abilities. One study (Hackney et al., 2007) also indicated physical improvements in patients with Parkinson's disease after

receiving tango classes. If future studies strengthen the results from these studies and other studies, DMT may be seen as an appropriate intervention in populations of elderly patients suffering from both physical and cognitive impairments.

There are also some evidence that DMT can promote a better body awareness, or a more realistic body image, in some patients. But the results in this area are mixed. Probably, better standardization of tests used in this research, as well as proper control groups, would make it easier to draw conclusions about the effect of DMT on body awareness and body image.

The majority of the research on DMT regarding anxiety-reduction included in this paper, have studied reasonably well-functioning individuals, like students, who probably had few additional problems (Erwin-Grabner et al., 1999; Kuettel, 1982; Leste & Rust, 1990); while most of the studies on body image used populations with psychiatric (Apter et al., McCarthy, 1973) or physical (Sandel et al., 2005; VanDeusen & Harlowe, 1987) diseases. The studies regarding anxiety found mainly positive results, while the studies regarding body image found mixed results. One explanation for this may be that positive results are easier to obtain in populations with more resources and less complex symptomatology.

6.1.1 Evaluation

In sum, it seems that DMT might contribute to reduce anxiety, decrease symptoms of depression, and enhance a feeling of well-being in participants. These effects are best documented with respect to relatively well-functioning adults and youths. There are some indications that the same effects may be present in populations with hospitalized, psychiatric patients, but evidence of DMT releasing symptoms of psychosis or other psychiatric disorders does not exist. DMT may also possibly enhance some aspects of physical functioning in various patient groups. The results regarding body awareness, body image and self esteem are

mixed, but gives reason to further research. Likewise, research on the effects of DMT on children are unclear. A few well designed studies indicate that DMT may improve cognitive function in elderly patients.

6.2. What Factors in DMT can be Assumed to Cause Effects?

As stated above, dance therapy seems to have an effect on mental health at least in a few circumstances. This paper already presented factors which are believed by DMT practitioners to cause positive effects, such as: the relationship to the therapist, receiving unconditional positive regard, the containing function of the group, group synchrony, processes bringing to consciousness suppressed emotions, letting go of emotional tension, verbal processing of non-verbal experiences, movements causing new emotional experiences, focus inward, greater control over the body, experiencing mastery, and having increased social skills. There is consensus about some theoretical perspectives, while others are more speculative. But few of these are directly tested through research. However, many of the mentioned factors are difficult to investigate scientifically. The lack of proper operationalizations for some of these concepts makes quantitative studies almost impossible. Some of the concepts are also difficult to study qualitatively, as questioning people would influence how they respond. This may explain the lack of correspondence between factors believed to be therapeutic, and the factors that have actually been scientifically investigated.

Two of the factors just mentioned is studied with regard to psychotherapy and psychological interventions in general. This is the patient-therapist relationship and the experience of mastery. In addition to these two factors, a few other factors seems essential to look into, as they are assumed to have positive health effects in other areas than DMT. These are *exercise, music, the use of creativity,* and *group cohesion*. It is essential to establish whether the effect of DMT is to be attributed to any of these mechanisms alone, or to the

specific combination of mechanisms that possibly exists only in DMT. Knowledge about these matters is necessary to be able to recommend DMT as an effective treatment or not. To attain better knowledge about the contributing factors, is also crucial. For example, if exercise intensity is an important predictor of effect, one should increase the focus on physical exercise. If group cohesion is an important predictor, commitment to a group should be stressed and perhaps more focus should be put on the composition of the group. If the effect of DMT is not greater than the effect of any of these factors mentioned, DMT cannot be recommend over other interventions including the same factors, for instance regular dance classes, other forms of exercise, or group activities. However, if the total effect of DMT is greater than the effect of these factors mentioned, there is reason to believe that this treatment technique is a valuable supplement, or alternative, to traditional treatment for certain people.

6.2.1 Exercise

Some of the studies reviewed above did control for the effect of physical exercise (Apter et al., 1978; Dosamantes-Alperson & Merrill, 1980; Franklin, 1979; Koch et al., 2007; Leste & Rust, 1990; Westbrook & Mc Kibben, 1989). As reported above, Apter et al., (1978) and Franklin (1979) found statistically significant differences between the DMT groups and the physical education groups on body image, with the DMT groups achieving more positive outcomes. In a more recent study (Koch et al. 2007), less depression was found in the DMT group than in the physical exercise group. A modern dance class was found to have more effect on anxiety than a physical exercise class (Leste & Rust, 1990), and a DMT group was reported to gain increased reactivity to their own feelings compared to a ballet class (Dosamantes-Alperson & Merrill, 1989). Westbrook & Mc Kibben (1989) used a crossover design, and found that patients with Parkinson's disease increased walking speed more after a DMT program than after simply exercising.

In total, it appears that physical exercise is not the single mechanism at work in DMT. Physical exercise alone cannot be said to explain the effect DMT appears to have on anxiety, depression, and reactivity to feelings. A focus on emotional aspects, which is present in modern dance, but mostly absent in ballet classes, seems to have a positive influence on the outcomes. As mentioned in the introduction, physical activity have a documented effect on mental health (Byrne & Byrne, 1993; Lane, 2001; Ommundsen, 2000; Stathopoulou et al., 2006; Taylor, 2006) Physical activity can therefore not be excluded as a factor contributing, or partly causing, the positive effects reported from DMT.

6.2.2 Music

The effect of music was controlled for in three studies (Koch et al., 2007; Leste & Rust, 1990; May et al., 1974). The first (Koch et al., 2007), reported less depression and more vitality in the DMT group than in the music group. The second (Leste & Rust, 1990), reported reduction in anxiety in a DMT group compared to a music group, including aesthetic sensitivity training. But the music group consisted only of 7 participants, whereas the dance group had 23, and the standard deviation was relatively large, so final conclusions cannot be drawn. Only one study (May et al., 1974) compared DMT with music therapy, and found some effect, but no significant differences between these groups. But since both music and dance therapy include music the effect could possibly be due to music alone. Trevarthen and Malloch (2000) argue that music and dance works through the same mechanisms, namely by enabling non-verbal engagement with the world and other people, evoking sympathy and promoting intersubjectivity:

> We believe that music is therapeutic because it attunes to the essential efforts that the mind makes to regulate the body, both in its inner neurochemical, hormonal and metabolic processes, and in its purposeful engagements with the objects of the world,

> and with other people. Music, with dance and all the expressive arts, offers a direct way of engaging the human need to be sympathised with – to have what is going on inside appreciated intuitively by another who may give aid and encouragement. (p.)
>
> Studies of DMT with and without music would help determine the role of playing music in therapy, but musicality will always be a part of dance and can therefore not be excluded, or controlled for. (p.11)

6.2.3 Creativity

Except from the study comparing DMT with music therapy (May et al. 1974), no studies use other creative activities as control groups. Whether expressing creativity in other ways, such as through designing, painting, acting, constructing, or writing would have the same effect, is not known.

6.2.4 Group cohesion and relationship to the therapist

Relationship to the therapist is seen as one of the main factors causing therapeutic change in psychotherapy (Lambert & Barley, 2001). Group cohesion in group psychotherapy can be seen as the analogue to the good client-therapist relationship in individual therapy (Braaten, 1991). It denotes a supportive environment where self-disclosure is made possible by an empathic, listening, and accepting group offering feedback and seeking to achieve certain goals.

Some studies compared outcomes from groups receiving DMT with outcomes from groups receiving treatment as usual (Berrol et al., 1997; Boswell, 1993; VanDeusen & Harlowe, 1987). In these cases, treatment as usual was motor programs or different activity groups, and the relationship to the trainer, coach, therapist, or group is not known. One study used controls receiving traditional group therapy (Kuettel, 1982), but only for one session. The results indicated fewer feelings of anxiety and depression, more feelings of affection and

confidence, but also more somatic distress, in the DMT group than in the group receiving group therapy. But as this was only a single session, it must be seen as a measure of immediate effects rather than the process of change. What it controls for is not a long term relationship or group cohesion developed over time, but rather the feeling of social engagement and participation in any group. One can argue that if group cohesion or relationship to the therapist was the main factor contributing to change, one should see more positive results in the studies with a long duration of intervention than the studies of short duration programs. The fact that some studies show significant changes after only a short term intervention (Erwin-Grabner et al., 1999) or a single session with DMT (Brooks & Stark, 1989; Koch et al., 2007; Kuettel, 1982; West et al., 2004), may be seen as indication that group cohesion or relationship to the therapist is not the only factor promoting change. On the other side, meeting other people and a supportive therapist, and experiencing to be accepted as part of a group, might have an effect already in the fist session.

6.2.5 Other factors suggested

One of the studies discussed above (Koch et al., 2007) builds on recent research indicating that both currently and formerly depressed patients show less vertical movement, than those who has never been clinically depressed (Michalak, Troj, Schulte & Heidenreich, 2006), and suggests that a specific effect of dance on depression may be stimulation of this missing aspect of their movement repertoire. Their intervention is therefore designed to increase movement in the vertical dimension. As reported above, the results do in fact indicate an improvement, but several factors apart from vertical movements may be responsible for this change. However, it is suggested here that specific movements, or the nature of the movements performed, are responsible for a positive effect on depression.

A feeling of accomplishment or mastery is suggested, by one author (Bartholomew, 2002), to be responsible for positive outcomes from aerobic dance, since he did not find outcomes to vary with exercise intensity. Mastery is also assumed to be as a underlying mechanism in the study by Erwin-Grabner et al. (1999), as DMT, specifically directed towards increasing feelings of self-efficacy and mastery, was found to reduce test anxiety.

To sum up, as in psychotherapy research in general, to find out *how* change happens is extremely difficult, and such research has both ethical and methodological difficulties to overcome. There is still a need for research to explore whether a theory, normally used in a different setting, can be transferred to a DMT setting. For example; does DMT lead to feelings of mastery? Does it lead to better understanding of non-verbal communication? Is the relationship to the therapist as essential in DMT as in verbal psychotherapy? Does moving in unfamiliar ways increase a person's emotional register? And if so, is this associated with positive changes? Does a person who learns to take more initiative in a DMT setting start taking more initiative in other arenas of life as well? Such questions could be answered through carefully designed studies.

6.3 Is there Any Evidence to Support the Notion that DMT can Affect Affect Regulation?

As discussed above, a number of mechanisms may be responsible for the health-enhancing effects, however small, reported in some studies on DMT. But are these direct effects, or do they work in a more indirect manner? How and why should these factors lead to better health in persons with widely different problems? As it is difficult to single out one mechanism which alone is responsible for all positive changes, it is reasonable to assume that several factors work together. One possibility is that the various factors are combined so that one factor adds to another, and the total outcome is better than if the intervention only

included one of these factors. Another possibility is that several factors, with no effect when isolated, interact, and that it is only the combination of these factors which is effective.

Expression of affect is of central concern in DMT, and DMT is assumed to influence, or change, affect (Kuettel, 1982). Differentiation, integration, and regulation of feelings are identified as central themes in DMT programs and interventions (Berrol et al., 1997; Bojner-Horwitz, 2004; Jeong et al., 2005; Koshland et al., 2004), as it is in many forms of psychotherapy. Some therapists have claimed that DMT will lead to increased reactivity to one's own feelings and greater expression of emotions (Dosamantes-Alperson & Merrill, 1974), as well as an increased physical and emotional integration (Fletcher, 1979). These are both aspects of affect regulation.

In spite of this being a central concern, there are only very few studies measuring the effect of DMT on various abilities related to regulating and dealing with affect. The pilot study by Meekums (2008), on the effect of individual DMT with children on emotional literacy (EL), indicated some improvements in skills such as expression of emotions, self-esteem, and social function. This study has an interesting objective, but should be carried out on a larger scale in order to offer any credible results. In the two pilot studies carried out by Kuettel (1982) the attendants reported to experience more affect than did those in the control group and those receiving group therapy. Those in the dance therapy group reported somewhat less feelings of depression and anxiety, and somewhat more feelings of confidence, affection, erotized affection, but also more somatic distress, anger, and inhibition. It seems odd that the same group reported both more feelings of confidence as well as more feelings of inhibition and distress. But it may indicate that dance therapy enhance the tendency in subjects to either experience, report, or detect certain affects. It is reasonable to ask whether

or not expression of affect really is beneficial. Were the subjects better off recognizing their anger? Or perhaps it would have been better not to be aware of these negative feelings?

The study on the effect of DMT on self-actualization (Dosamantes-Alperson and Merrill, 1980) is also interesting in the context of affect regulation. Self-actualization is operationalized by six aspects, and several of these has to do with regulation of affect: Inner-directedness, existentiality, feeling reactivity, spontaneity, self-acceptance and capacity for intimate contact. The authors actually conclude that the movement therapy both increased the subjects' sensitivity to their own feelings as well as their ability to express them.

An area where affect regulation seems of obvious importance is among children with behavioral problems. The evaluation of Kornblum's program for aggression prevention in schools (Hervey & Kornblum, 2006), described in section 4.5, also included qualitative interviews. The authors suggest, on the basis of these, that one of the positive outcomes of the intervention, not specifically measured quantitatively, was more effective emotional self-regulation. Children reported becoming less mad, calming down, or being in a better mood after the intervention.

More research is needed in order to establish whether DMT may increase the ability to regulate affect. Still, these few studies suggest that this may be the case, and justifies further exploration. A more adaptive affect regulation would than be a possible mechanism through which DMT could enhance mental health. As dysregulation of affect is central to a range of mental disorders, a treatment that is supported by research to have an effect on this particular ability would have a broad field of application. In addition to people with mental disorders, the treatment could also be relevant to healthy individuals who want to develop their personality, or enhance their “self-actualization” (Dosamantes-Alperson and Merrill, 1980).

7.0 Conclusion

DMT seems to have some positive effects on health for certain groups of people. It is possible that for some patients or clients, the combination of factors in group DMT, like group cohesion, musicality, physical activity, relationship to the therapist, and expression of creativity, has a total benefit which is greater than the effect of one, or a few, of these factors alone. It may be argued that some positive effects should be expected, since group DMT combines several factors that have shown effective in other contexts. If one factor adds to another, group DMT may be one of several ways to combine these efficient factors and affect health in a positive manner. Another option is that the effect of DMT is not caused by combining several factors that are common in a wide array of treatments, but that DMT offers a qualitatively different way of treating patients. However, more research is needed in order to assess both *if,* and *why* this widely defined form of treatment may result in therapeutic changes.

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9.0 Appendix: Table of quantitative studies on DMT

	N	Characteristics of participants	Design	Control group(s)	Instruments	Follow-up after ended treatment	Length of intervention	Results
Psychiatric patients								
Apter et al. (1978)*	30	Psychotic adolescent in-patients	Within-subjects + Between-subjects, random assignment into 3 groups; movement therapy individually, in groups, and control	Control group included dance and gymnastic activities	Volwiler Body Movement Analysis Scale (VBMA)	No	60 min, 3 times a week for 3 months	Stat. significant results on body image. Both individual and group therapy as effective.
Brooks & Stark (1989)*	40	20 in-patients, 20 out-patients	Pilot study, random allocation	One no-treatment group	Mutiple Affect Adjective Checklist	No	Single session	Stat. significant decrease in anxiety and depression
Christup (1974)*	54	Hospitalized, schizophrenic patients	Pretest-posttest, between-subjects	Two no intervention groups	Goodenough Scale, Swenson Differentiation Scale	No	21 sessions during 13 weeks	Females and those who were most active showed the most improvement
Kline et al. (1977)	10	Psychiatric outpatients	Within-subjects	None	Rathbone Muscle Tension Test, State-Trait Anxiety Inventory			Stat. significant decrease in trait anxiety and muscle tension
Koch et al. (2007)	31	Patients with main or additional diagnosis of depression	Between-subjects, Random assignment	One control listening to music (music only) and one moving on ergometer bike (movement only)	Heidelberger Befindlichkeitsskala (12-item state inventory)	No	Single session	Dance group showed sign. less depression than both other groups and more vitality than music group
Marek (1975)*	23	Psychiatric patients			Tennessee Self-Concept Scale, Movement Dimension Scale			
Mattes et al. (1986)*	31	Psychiatric inpatients	Within-subjects		Self-made measure			Potential confounds (medication, other forms of therapy)
May et al.	38	Chronic,	Random	Music therapy	Self-made measures (Behavioral rating	No	3 times	No improvement

(1974)*		regressed schizophrenic patients	assignment to individual treatment, group treatment or control groups	groups as control	scales by an independent psychiatrist, ratings by nurses and technicians, and evaluation by therapist), Rorschach test		weekly for 6 months	due to DMT
McCarthy (1973)*	8	Psychiatric outpatients	Within-subjects	None	Draw-a-Person			Improved body-awareness
Healthy adults								
Dosamantes (1990)*	22	Students in a Graduate DMT program	Long-term process research, within-subjects	None	D-A Expressive Movement Scale, Psych. and Object Relations Test	No	Twice a week for two years	Changes in individual and interactional movement style reported
Dosamantes-Alperson & Merrill (1980)*	52	Volunteering college students	Within-subjects and between-subjects	One ballet-class and one waiting list control group	Personal Orientation Inventory, Second-Jourard Body-Cathexis Scale, D-A Expressive Movement Scale	No	90 min twice weekly for 8 weeks	Sign. changes on measures of self-actualization and body-self acceptance
Erwin-Grabner, Goodill, Hill, & Neida, 1999)	21	Students with test anxiety	Simple outcome study, random assignment	One no-treatment group	Test Attitude Inventory (TAI)	No	35 min twice a week for 2 weeks	Stat. sign. greater reduction in TAI among target group than controls
Kuettel (1982)*	17	Female students	Between-subjects, random assignment	Control group 1 participated in regular student activities, control group 2 had a session with group therapy	Feelings Questionnaire	No	Single session	Fewer feelings of anxiety and depression, more feelings of affection, confidence and somatic distress
Leste & Rust (1990)*	84	Students, groups as part of their degrees	Within-subjects	Music group, physical education group and mathematics group	State-Trait Anxiety Inventory	No	Throughout a school year	Stat. sign. reduction in anxiety
Silver (1981)*	53	Volountary subjects			Semantic Differentiation Test			Subjects reported to see their body as more graceful, fast, active, strong and

								beautiful
West et al. (2004)	69	Collage students, already enrolled in classes of african dance, Hatha yoga or biology	Pretest-posttest	3 experimental conditions: African dance, Hatha yoga and biology class	Perceived Stress Scale (PSS), Positive Affect and Negative Affect Schedule (PANAS), saliva sample for cortisol	No	Single session, 90 min	Changes in cortisol levels and changes in positive affect was neg. correlated in yoga, but pos. correlated in african dance. Both reduced perceived stress and negative affect
Physically ill and disabled patients or patients with other problem areas								
Bojner-Horwitz (2004)	36	Female fibromyalgia patients	Random assignment	One waiting list control group	Analysis of serum concentrations of relevant hormones in plasma and saliva Montgomery Åsberg Depression Rating Scale (MADRS), Comprehensive Psychopathological Ratin Scale (CPRS), Sense of Coherence (SOC), Swedish Universities Scale of Personality (SSP), Visual Analogue Scale (VAS) and self-report on life events and general well-being Video interpretation techinique (VIT)	8 monts after ended treatment	6 months	No significant differences on MADRS, nor on hormonal measures. VIT and self- figure drawings indicated improvements on well-being, self-perception and perception of pain
Dibbell-Hope (1989)*	33	Women with breast cancer	Within-subjects		Profile of Mood States, Symptom Checklist 90.Revised, Bersheild-Walster, Bohmstedt Image Scale			Age and experience with physical activity predicted changes in body-image
Franklin (1979)*	22	Mentally retarded youth in a special school	Between-subjects + Within-subjects	One physical education group	Cratty & Sam's Body Image Test, Draw-a-Person Test	No	30 min twice a week for 10 weeks	Stat. sign. more improvements in body image in DMT group than in physical education group

Hackney et al. (2007)	38	Parkinson's disease recruited from treatment center	Blinded ratings, random assignment	One exercise group including both PD patients and controls, one tango group with PD patients and healthy adults	Activities-specific Balance Confidence (ABC) Scale, Modified Falls Efficacy Scale Philadelphia Geriatric Center Morale Scale + physiologic measures	No	20 sessions over 13 weeks	Improvements in measures of falls, gait and balance confidence in those with PD in the tango group compared with those with PD in exercise group
Ho (2005)	16	Cancer patients recruited from support center	Within-subjects	None	Pereived Stress Scale (PSS), Rosenberg Self-Esteem Scale	No	90 min once a week for 6 weeks	Scores on PSS was stat. sign. lower after DMT, with an effect size of .49. Self-esteem scores had an effect size of .46, but was not stat. sign.
McConnell (1988)*	23	Forensic adults with antisocial behavior			Tennessee Self-Concept Scale, Goodenough Draw-a-Person Test			
Ohwaki (1976)*	19	Institutionalized, severely retarded adults	Within-subjects	None	Goodenough Scale, Body-Part Test	3 weeks after ended treatment	60 min. 5 days a week for 5 weeks	Stat. sign. changes in body-image on post-test and follow-up
Reiland (1990)*	3	Alcoholic women	Within-subjects	None	Drawing of the Human Figure Test Articulation of Body Concept Scale			Indications of decreased denial and isolation, and increased abilities of articulation and self-esteem
Sandel et al. (2005)	29	Women with breast cancer	Randomized control trial with group cross-over	Waiting list control group	Functional Assessment of Cancer Therapy—Breast questionnaire, The Body Image Scale, shoulder ROM	For the interven-tion group (N=19) 14 weeks after ended treatment	18 sessions during 12 weeks	Stat. sign. improvement on quality of life in DMT group compared to cotrols. Changes in ROM, but too large variability to determine stat. sign.

								Both groups improved on body image
VanDeusen & Harlowe (1987)*	96	Patients with rheumatoid arhritis	Between-subjects	Treatment-as-usual as control group	Body Awareness Semantic, Differentiation Scale	4 months after ended treatment	8 weeks	Stat. sign. improvements in body image and range of motion in DMT compared to controls.
Elderly								
Haboush et al. (2006)	20	Depressed older adults, recruited via advertisement	Pilot study, random assignment	One delayed-treatment group	Geriatric Depression Scale (GDS), Hamilton Rating Scale for Depression (HRSD), Symptom Checklist 90, Revised (SCL-90R)	No	45 min pr week for 8 weeks	Effect sizes were in the medium range for the GDS and HRSD, and in the small range for the SCL-90R
Berrol, Ooi & Katz (1997)	107	Elderly, with non-progressive neurotrauma	Between-subjects, quasi-random assignment	Elderly receiving treatment as usual as controls	Functional Assessment of Movement and Perception (FAMP) National Institute on Aging Frailty in Injuries Cooperative Studies Intervention Techniques Battery (NIA FICSIT), Cognitive Performance Scale (CPS), Geriatric Depression Scale (GDS), and parts of two social interaction scales	Yes	No	Stat. sign. increase on some aspects of physical function, cognition (CPS) and social interaction for target group compared to controls. Not sign. results for rhythmic differentiation or depression
Duignan et al. (2009)	6	Patients in residential dementia care facilities	Pretest-posttest, within-subjects	None	Cohen-Mansfield Agitation Inventory (CMAI)	No	4 weeks	Agitation scores reduced in 4 out of 6 residents
Hokkanen et al. (2008)	29	Patients recruited from dementia nursing home	Double baseline	One no-treatment group	Mini-Mental State Examination, the Word List saving score Clock Drawing Test Cookie Theft picture description task Nurses' Observation Scale for Geriatric Patients (NOSGER)	Yes, 4 weeks after ended treatment	One session a week for 9 weeks	MMSE and measures of self-care improved slightly, but stat. significantly more in target group than

								control group. Differences between groups on CDT, but not at follow-up. No differences on word list savings, nor on total NOSGER,
Westbrook & McKibben (1989)	37	Outpatients with Parkinson's Disease (mean age approx. 71)	Crossover design	Exercise group	Beck Depression Inventory Behavioral measures (speed of walking)	No	60 min, 6 weeks	Stat. sign. larger changes in walking speed in dance group compared to exercise group. No stat. sign. improve-ments in BDI.
Children								
Boswell (1993)*	25	Children (7-10 yrs) with mental retardation, from 2 different elementary schools	Between-subjects, random assignment	Traditional gross motor program	Self-made measure	No	50 min once a week for 12 weeks	Stat. sign. increased dynamic balance skills among DMT group compared to controls.
Chin (1988)*	16	Visually impaired children			Hill Performance Test of Selected Positional Concepts			Stat. sign. improved muscle control, balance and spatial awareness
Hervey & Kornblum (2006)	56	Children in one elementary school	Pretest-posttest	None	Behavior Rating Index for Children	No	45 min per week for varying periods of time (one semester, ¾ of a year or a full schoolyear)	Stat. sign. decrease in problematic behavior.
Jeong et al. (2005)	40	Girls in middle school with mild depression,	Between-subjects, random assignment	One delayed-treatment group	Symptom Checklist 90, Revised, plasma concentration of cortisol, serotonin and dopamine	No	45 min 3 times per week for 12	Stat. sign. decrease in scores of psycholog-ical distress in DMT group compared to

		recruited from a large number.					weeks	controls. Serotonin concentration increased and dopamine concen-tration decreased in the DMT group.
Kavaler (1974)*	71	Mentally retarded children			Personal Orientation Inventory, How I Feel About Myself Test, Lincoln-Oseretsky Motor Dev. Scale, Teacher's ratings			No stat. sign. improvements on motor performance, body-awareness, or self-concept
Koshland et al. (2004)	54	Children in one elementary school	Between-subjects + within-subjects	4., 5., and 6. graders used as controls while 1., 2. and 3. graders received the intervention	Student Response Form, Behavior Incident Report Form filled out by teachers, classroom observation and the principal's log of aggressive incidents	No	50 min per week for 12 weeks	Stat. sign. larger decrease in aggression and problem behavior among target group than among controls
Meekums (2008)	6	Children referred from their teacher	Pragmatic, uncontrolled study	None	Self-made measure (techer-ratings and therapist notes)	No	Once a week for 10 weeks	Indications of links between therapist notes on movement metaphors and positive teacher-rated outcomes
Wislochi (1981)*	11	Children with varying psychological and physical disturbances	Within-subjects		The Avalon DMT Assessment			Ritter & Low (1996) analyzed raw data and found stat. sign. changes in attention, participation and relaxation

*Included in metastudy by Ritter and Low (1996).