

WHAT HAPPENS WHEN MUSIC THERAPY HAPPENS: THE DYNAMICS OF MUSIC THERAPY?

¿Qué sucede cuando hacemos musicoterapia: La dinámica de la musicoterapia?

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ABSTRACT

This paper presents a bridging theory of music therapy, intended to describe the core concepts of music therapy in an intuitive fashion that is accessible to a multi-disciplinary audience. Calling for a paradigm shift in the way that music therapy is empirically validated, it highlights the difficulty with the protocolization of music therapy for the purpose of randomized control trials. Centred around the phenomenon of entrainment, it proposes a broad definition of the iso-principle and describes what happens when music therapy happens from a dynamical systems perspective. The therapeutic alliance is described analogously to the bond between participatory sense-makers, or two entrained dynamical systems and a selection of video excerpts are used to exemplify how music therapists use the broad iso-principle to entrain with their service users and lead them from one state to another.

Keywords: music therapy, dynamical systems, therapeutic alliance, iso-principle.

RESUMEN

Este artículo presenta una teoría puente de la musicoterapia, destinada a describir los conceptos básicos de la musicoterapia de una manera intuitiva que sea accesible a una audiencia multidisciplinaria. Al hacer un llamado a un cambio de paradigma en la forma en que la musicoterapia se valida empíricamente, destaca la dificultad con la protocolización de la musicoterapia orientada a ensayos controlados aleatorios. Centrado en el fenómeno del arrastre, propone una definición amplia del principio iso y describe lo que sucede cuando la musicoterapia ocurre desde una perspectiva de sistemas dinámicos. La alianza terapéutica se describe de manera análoga al vínculo entre los creadores de sentidos participativos, o dos sistemas dinámicos arrastrados, y se utiliza una selección de extractos de vídeo para ejemplificar cómo los musicoterapeutas usan el amplio principio iso para entrenar a los usuarios de sus servicios y conducirlos de un estado a otro.

Palabras clave: musicoterapia, sistemas dinámicos, alianza terapéutica, principio iso.

BACKGROUND

Music therapy (in its modern professional incarnation) traces its origins to the aftermath of the Second World War (Davis & Hadley, 2015) and may be defined as a systematic process of intervention using musical experiences in order to help a client promote health (Bruscia, 1998 as cited in Frederiksen, 2019 p.26). Although different governing and accreditation bodies define it slightly differently around the world, common ground can be found in the 'evidence based' paradigm, the necessity of its delivery by a credentialled professional and its use of music as the primary therapeutic medium (i.e. the therapy is delivered through listening to, moving to, creating, re-creating and discussion of music and musical experiences) (Health Service Executive [Ireland], 2022; Irish Association of Creative Arts Therapists, 2024; Deutsche Musiktherapeutische Gesellschaft, 2022; British association of music therapy, 2022; American music therapy association, 2005). Music therapists work in a wide variety of

settings including schools, hospitals, care homes and private clinics and are thus often embedded in multi-disciplinary teams.

Music therapy theory

Music therapy academic theory generally instantiates in one of three flavours, indigenous, recontextualization and bridging theories (Aigen, 2005 pp. 23-28, as cited in Lauzon, 2011). Indigenous theories hold the music itself as the primary focus of analysis, solely using the academic language of music therapy, a critique of this approach is that it can prove impenetrable to other professionals in the multi-disciplinary teams in which music therapists are often embedded, as well as for policy makers (especially when these extra-professional colleagues are not musicians themselves). Recontextualization theories on the other hand, solely use the language and concepts of other disciplines to describe the music therapy process.

A critique of this approach may be that much of the information and phenomena that music therapists use to inform their practice can get lost in translation. The final flavour comes in the form of bridging theories. These theories “attempt to bridge the gap between music therapy and other disciplines using languages and concepts from music therapy and other disciplines” (Lauzon, 2011). This paper will take the form of the latter approach and rather than adopting the view of a music therapist, will attempt to utilise the transdisciplinary nature of systems science (Hieronymi, 2013) to construct a bridging theory of music therapy to behold an accessible view for a multi-disciplinary audience whilst maintaining the meaning of the core indigenous concepts and language.

The need for a paradigm shift

As an ‘evidence-based’ discipline, music therapy has been subjected to numerous randomized control trials (RCT’s) (Vink & Bruinsma, 2003), the gold standard generally being the Cochrane reviews, of which, numerous studies have returned inconclusive results (Aalbers et al., 2017; Gold et al., 2005; Gold et al., 2006; Bradt et al., 2010; Bradt & Dileo, 2010). Some researchers have pointed out that the inconclusiveness of these studies may be due to the evidence-based paradigm, as RCT’s are not applicable to the key features of dynamic psychotherapy which are subjective in nature (Shedler, 2010, 2015; Shean, 2015). Other researchers, broadly in concurrence with this view have already tried to construct theories using the language of dynamical systems (Crowe, 2003; Lauzon, 2011). However, these attempts seem to generate more confusion and jargon, as Crowe (2003) lamentingly concludes that “we can never know how and why music therapy works”. Lauzon

(2011), on the other hand, creates a complicated web of musical systems and musical states that seem to lack falsifiable predictions. The paradigm shift adopted by these researchers however will stand as our precedent and rationale for the coming attempt at providing an answer to a special case of Lauzon’s (2011) question “what happens when music happens”, that being, ‘what happens when music therapy happens’.

Core concepts of music therapy

Music therapy, being part of the creative arts branch of therapies, is generally considered to be psychotherapeutically oriented (De Witte et al., 2021) although other approaches do exist within the field, namely neurologic music therapy, which takes a neuroscientific approach (Thaut & Hoemberg, 2014) and educational music therapy (taking an educational approach, (Wilson, 1991)). The bridging theory outlined here is an attempt to describe what happens when music therapy happens regardless of the theoretical approach. Because of this, rather than focusing on theoretical orientations within the discipline, we shall examine concepts that are present independent of any given theoretical orientation. These centre around health musicking, the therapeutic alliance and the iso-principle which will be described in detail in the next sections. One final piece of housekeeping before we continue, is to differentiate between music therapy and health musicking.

Health musicking

Health musicking is defined as “the appraisal and appropriation of the health affordances of the arena, agenda, agents, activities, and artefacts of a music practice” (Stige, 2002, p. 11) and is a derivative of Small’s (1998, p. 9) original term musicking, which is “to take part, in any capacity in a musical performance, whether by performing, by listening, by rehearsing or practicing, by providing material for performance (what is called composing), or by dancing”. Although health musicking can take place in any context, when it is explicitly used by a music therapist, in a therapeutic context, we may think of it as the process of music therapy or the mechanism by which music therapy manifests (with music therapy being the overarching field).

The therapeutic alliance

The therapeutic alliance is the strongest positive indicator of outcome across the psychotherapies (De Witte et al., 2021) and may be thought of as “the specific type of relationship between the patient and therapist, which takes place in a setting oriented towards the patient’s change and development” (Frederiksen, 2019, p. 23). This can be further broken down into the “personal” and “task related” alliances

(Hougaard, 1994). De Witte et al. (2021) note that “music therapy enhances therapeutic alliance and group processes through playful musical interactions, shared musical experiences, musical attunement, musical synchronicity and musical dialogue”.

The iso-principle

The iso-principle is an indigenous music therapy term (Goldschmidt, 2020 p. 1) and may be considered to be a special case of entrainment (Kim et al., 2018). Entrainment in this context means “the formation of regular, predictable patterns in time and/or space through interactions within or between systems that manifest potential symmetries” (Collier & Burch, 2000). Regarded as “the heart of much current music therapy practice” (Bunt, 1994, p. 34) or “Principle Number One” (Donald & Pinson, 2012 as cited in Goldschmidt, 2020, p. 6), the Iso-principle can be described as “using one or more elements of music to meet a patient’s current state, then changing said musical element(s) to lead them to a different state” (Altschuler, 1954; Heiderscheit & Madson, 2015; Yinger & Lownds, 2018 as cited in Goldschmidt, 2020, p. 1).

One of the major problems associated with this term however is the way in which it is used, as “contemporary literature indicates that its definition may have become much more than its original intent” and “the current descriptions and clinical illustrations regarding its use... are scarce” (Heiderscheit & Madsen, 2015). Goldschmidt (2020, p. 2) corroborates these findings and notes “considerable disagreement amongst scholars in 1) what bodily state is/can be modified, and 2) the specific elements of music (that) drive the intended change”.

Though there are sparse empirical investigations into the iso-principle, the ones that have taken place (Starcke et al., 2021; Goldschmidt, 2020; Heiderscheit & Madsen, 2015; Lee, 2005; Shatin, 1970) report conflicting results. This may be due to the disagreement among the definitions or the difficulty in protocolizing such person-centred approaches to therapy that is common across the evidence-based therapies.

In line with our previous call for a paradigm shift, rather than attempting a randomized control trial (likely to return inconclusive results), for the remainder of this paper, we shall try to define the ‘first principle of music therapy’ and propose a natural mechanism for the phenomenon.

DYNAMICAL DYADS PARTICIPATORILY SENSE-MAKING

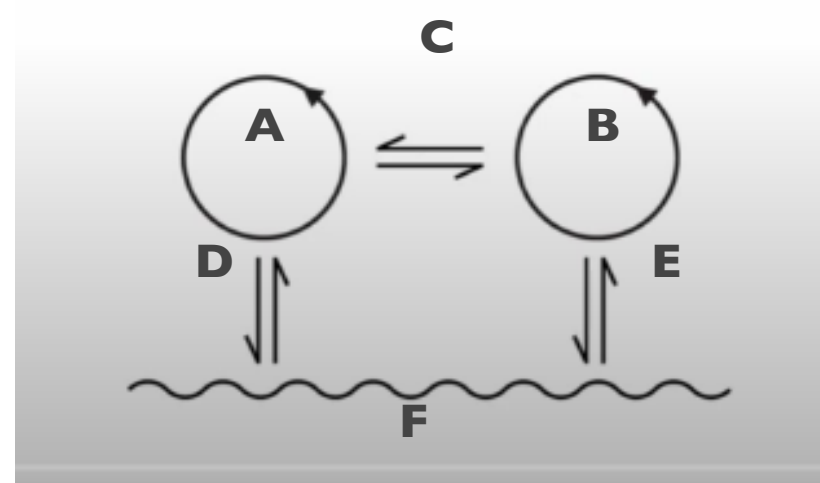
Since the publication of Varela, Thompson and Rosch’s *The embodied mind* in 1991, the 4E (embodied, enactive,

embedded & extended) turn in the study of cognition has gathered more and more steam (Newen et al., 2018, pp. 3-4). This work has been supported by the ecological psychology of Gibson (Lobo et al., 2018), *The extended mind* of Clark and Chalmers (1998) and more recently the participatory sense-making of De Jaegher and Di Paolo (2007). Drawing on this tradition and in particular, the theory of autopoiesis (Maturana & Varela, 1973), De Jaegher & Di Paolo (2007) describe an enactive account of social cognition through what they term “participatory sense-making”.

The result of which is a symbol presented in the image (Figure 1) below. It should be stressed that one need not adopt the theoretical viewpoint from 4E cognition (mentioned above) in order to adopt our view. One may also view the symbol as any two dynamical systems interacting from say, a purely mathematical perspective or from such a psychodynamic viewpoint as two persons interacting. The key here is that the symbol, here titled participatory sense-makers, can be understood independently of one’s theoretical standpoint and in that sense is transtheoretical (transtheoretical as in beyond any singular theoretical viewpoint).

Figure 1.

Participatory sense-makers.



Note: adapted from De Jaegher & Di Paolo, 2007.

‘A’ and ‘B’ in the below image, may each represent an autopoietic system, a person, or a mathematical entity (dynamical system). ‘D’ and ‘E’ may represent the two-way connection between each entity and its environment, either through perception and action or some other means of

exchange, (e.g. musical or electro-chemical). 'F' represents the larger environment into which each entity is embedded, as a cell to a body, a person to a community, or a dasein to its Umwelt. Finally, 'C' may represent the interaction between the two systems. From an enactive viewpoint, it is their participatory sense-making, from a mathematical viewpoint, the entrainment of the systems, from a psychodynamic perspective, the 'special relationship' that exists between therapist and service user, also known as the therapeutic alliance.

As we turn our gaze to the special case of 'what happens when music therapy happens', we may see that when the therapist musically engages with the service user (health musicking), if done successfully, the two systems entrain (in a musical context, we may experience this as 'groove'). The more successful the entrainment, the stronger the bond between the two entities (i.e. the stronger the therapeutic alliance). If a therapist adopts an iso-principled approach, rather than immediately (to use the language of dynamical systems) forcing the service user to entrain with their (musical) state, the therapist will try and match their music to the state of the service user and once a connection has been established (the two systems entrain), the therapist subtly changes the musical interaction to either lead the service user from one state to another or enable them to regulate, express or perceive their own state.

This change may be in the degree or quality of interaction, or it may ideally lead to a sustained phase shift in the service user, moving them into a qualitatively or quantitatively different state of health. As previously mentioned, De Witte et al. (2021) note that the therapeutic alliance ('C') is strengthened "through playful musical interactions, shared musical experiences, musical attunement, musical synchronicity and musical dialogue".

As we are taking Figure 1 to be a symbol rather than an image, we must also note that it is not this or that particular music therapy entrainment system (as Lauzon [2011] attempts to taxonomize) but rather something metaphorically akin to a fractal structure which exists at multiple levels or resolutions simultaneously (something that may have led Crowe (2003) to her conclusion "we can never prove what factor in the music therapy process does or does not impact the process").

Just as music exists on the rhythmic, harmonic and timbral levels simultaneously, through the music a music therapist may entrain with their service user on a physiological, psychologic or communicative level. This means that the description can be understood from a psychodynamic viewpoint where the states being changed are qualitative

(e.g. pain reduction or emotional expressiveness (Dimaio, 2010), and at the same time, from multiple other viewpoints which may be more quantitative in structure. For example, breath rate, pulse, or in a neurologic music therapy context, a quantitative shift in a person's gait (e.g. stride length) (Thaut & Rice, 2014) or ability to speak (Thaut, 2014).

One of the most comprehensive descriptions of the dynamic interaction we are utilising, is presented in "the self-organising origins of agency" by Kelso (2016). In this opinion piece, based on the theory of co-ordination dynamics (Kelso & Fuchs, 2016), Kelso (2016) describes how the agency of a baby comes into the world through interaction with it.

Through the now classical experimental paradigm of mobile conjugate reinforcement, a baby's leg is loosely tied to a mobile, the baby discovers that it can affect its environment through the movement of its leg, where "this igniting of agency has a eureka like, 'aha' effect; mathematically it corresponds to a bifurcation in a coupled dynamical system". This bifurcation or 'phase-shift' in the relationship between a baby and its environment is analogous to the type of 'phase-shift' that a music therapist may bring about in co-operation with their service user and can be in relation to how they express or experience their inner worlds or how they interact with their environments and the people in them.

Redefining the iso-principle

As the "considerable disagreement" (as noted by Heiderscheit & Madsen, 2015) within the profession on clear definitions of the iso-principle appears pervasive (with Goldschmidt (2020 pp. 10-13) counting 18 different definitions since 1944), part of the aim of our current exploration is to render a clear view of this process.

Whilst it should be noted that this has become "much more than its original intent" (Heiderscheit & Madsen, 2015), the field of music therapy and the technology that we may utilize to examine it with have also grown accordingly. In conducting his pioneering psychiatric work in the aftermath of WWII, Altschuler can hardly have foreseen the development of neurologic music therapy, the Nordoff-Robbins approach or the modern field of music therapy in its entirety. Altschuler's original definition being "the principle of using musical identical to the mood or mental tempo of the patient" (1944, p. 793 as cited in Goldschmidt, 2020) with Altschuler (1948) later adding:

only after one has worked himself 'musically' into the

mood or tempo of the mental patient can a shift to a different mood or tempo be made [...] the mood or tempo of the music in the beginning must be in “iso” relation with the mood or tempo of the mental patient. The ‘iso’ principle is extended also to volume and rhythm”. (p. 266, as cited in Goldschmidt, 2020)

Considering the section 2 description of the music therapy process, we may tentatively propose a broad definition of the iso-principle as thus:

The broad iso-principle is the process of purposefully entraining with an individual in their current state through health musicking (where the entrainment may be on a physiologic, psychologic or communicative level), then changing the music (the medium through which entrainment manifests) to shift said individual from one state to another in a direction that moves them towards an idealized picture of health.

MUSIC THERAPY IN PRACTICE

Given our proposed definition of the broad iso-principle, we may now turn our gaze to some specific case examples to see if our view will explain what we observe. In each of the examples presented below, the phenomenon we are observing is ‘music therapy’, the process of sharing music between therapist and user “health musicking” (specifically “the appraisal and appropriation of the health affordances of the arena, agenda, agents, activities, and artefacts of a music practice” (Stige, 2002, p. 211) and the broad iso-principle as defined above.

Case study 1

Video example 1

<https://www.youtube.com/watch?v=fbDKHGg9upQ>

In this excerpt of a neurologic music therapy session, we see how the music therapist matches the rhythm of the music to the gait of the service user. Gradually as the service user entrains the rhythm and the “groove” develops, the therapist is able to increase the rhythm which leads to an increase in the speed, distance covered per step and stability of each step (to the point where the walking aid can be taken away). This specific technique is called rhythmic auditory stimulation (Thaut & Rice, 2014) and highlights physiological and neurological levels of entrainment through music between therapist and service user, highlighting how “Rhythm... may fruitfully be defined as an affordance for the entrainment of movement” (Cummins, 2012).

Case study 2

Video example 2

https://www.youtube.com/watch?v=NLuvEwu_dew&list=PLiMwuS3pt_NKUtrXQtLUTi6AammtG2ocZ&index=3

This excerpt of the Nordoff-Robbins music therapy approach to working with children with autism spectrum disorder (Nordoff Robbins Music Therapy, 2017) highlights how the music therapist constantly augments their playing to match the state of the service user, establishing entrainment on a social and emotional level and eventually allowing for the achievement of such goals as “accept less structure and tolerate unpredictability” (4:28-6:54) and “play classical pieces with expression” (6:54-9:10). In the former piece, the music therapist matches with Kate’s state by using a piece of music that she initially brought to the session, then evolving what could have been a static piece into a “musical debate/dialogue”, we see how the therapist maintains entrainment and prolongs the engagement by increasing the tension playfully upping the key with each cycle of the song. In the latter example the therapist follows Kate’s cycling through different classical pieces with vastly different emotional motifs to the point where Kate can express herself through an emotional connection to and through the music. This emotional entrainment, which on one level may be ineffable, is evident to the point that a brief pause for composures sake is shared at 8:53 before returning to the piece with renewed vigour.

Case study 3

Video example 3

<https://www.youtube.com/watch?v=GuFGGuIS5D0>

In the first example (2:59-4:22), we see how music therapy facilitates the development of the sucking reflex in babies in a neonatal intensive care unit in much the same way that Kelso (2016) describes the development of agency. Through the use of the “pacifier activated lullaby device” (Standley et al., 2010), preterm infants who are born without a sucking reflex due to neurologic immaturity, stimulate music through non-nutritive sucking behaviour on a pacifier that has been wired to a speaker. This non-nutritive sucking then follows over to nutritive sucking which can be further re-enforced by a music therapist entraining with the baby to facilitate breathing and swallowing as seen in minute 1:00-1:40 of this other excerpt (Example video 4 <https://www.youtube.com/watch?v=bwKCK3W-96E>). Although the first excerpt does not include a strict example of the iso-principle (in the sense that the infant is entrained with a machine rather than a music therapist), we can still see how music facilitates the development of a

relationship between the infant and its environment which is then re-enforced (with an example of the broad iso-principle) in the second excerpt, facilitating sucking, swallowing and breathing.

DISCUSSION

A transtheoretical bridge for music therapy

This approach to describing what happens when music therapy happens may suffer from similar criticisms as highlighted by Jansen (2018) in his review of Cobussen (2017) book, “complexity and musical improvisation” which examines improvisation in music as a field phenomenon. The main criticisms raised being “although the case descriptions of improvisational artists are compelling, selection of the case examples suggests confirmation bias rather than a balanced systematic selection” and “if logic of the analysis remains too implicit, it becomes difficult to validate or falsify the claims empirically” (Jansen, 2018). In a pre-emptive rebuttal to this line of reasoning, although the author must admit that the case studies were selected to highlight the phenomenon we have described, they were meant to be illustrative rather than used as proof of ubiquity. One falsifiable prediction that we might make from our given viewpoint is from the field of co-ordination dynamics. We may hypothesise that when interpersonal co-ordination (the level of entrainment between therapist and service user) appears more pronounced, it will correlate with better therapeutic outcomes (with the reverse also being true).

CONCLUSION

This transtheoretical bridging theory of music therapy, it is hoped, will provide a means for music therapists to describe what happens when music therapy happens in a way that does not lose any of the nuance or concepts that are captured in indigenous theories yet at the same time, prove permeable and perhaps even intuitive for the multi-disciplinary teams and wide array of service users (and carers) that music therapists often find themselves working with. It may be a useful reference for continuous professional development courses for teachers, parents, nurses, speech and language, occupational or physical therapists or any individual who may find themselves working with music therapists or may like to implement some music therapy techniques into their own practice. It may stand as a pedagogic tool for the field of music therapy as it manages to build a link from the once ethereal concept of the iso-principle to a natural

explanation of its mechanism through the process of entrainment. It may serve to provide a useful definition “the heart of much current music therapy practice” (Bunt, 1994, p. 34) in the broad iso-principle and ideally put to rest some of the theoretical disagreements within the field. It may provide a mutually intelligible language for music therapists to communicate what it is that they are doing when music therapy happens. Finally, this view of music therapy may shed some light on the inconclusiveness of randomized control trials as it highlights the difficulty in protocolizing how to entrain with an individual as they are in any given moment. Having generated a hypothesis, we may now open the doors to new ways of experimental investigation using the toolbox of systems theory, co-ordination dynamics and 4E cognition as a whole.

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APÉNDICE

Video example 1

<https://www.youtube.com/watch?v=fbDKHGg9upQ>

Video example 2

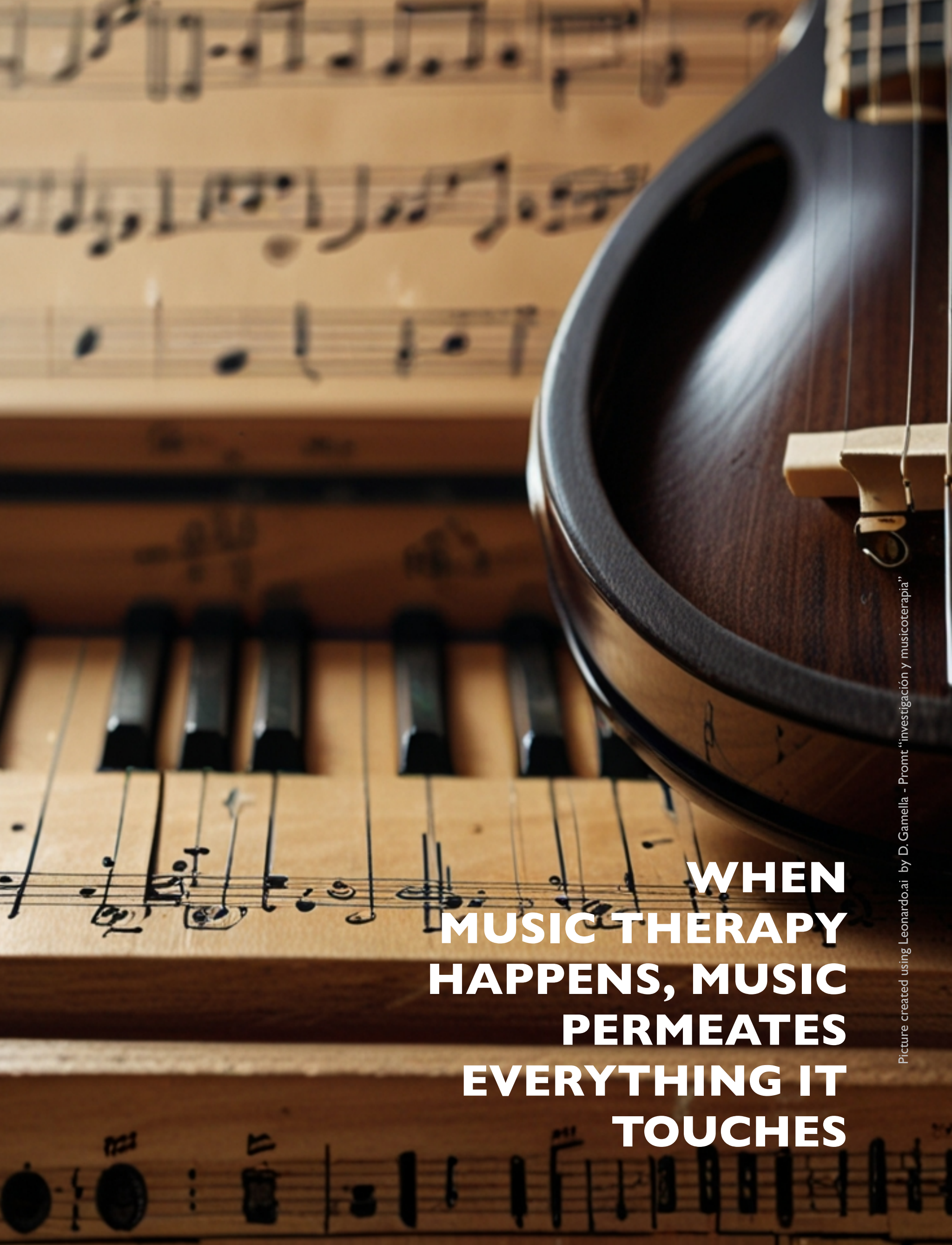
https://www.youtube.com/watch?v=NLuvEwu_dew&list=PLiMwuS3pt_NKUtRXQtLUTi6AammtG2ocZ&index=3

Video example 3

<https://www.youtube.com/watch?v=GuFGGuIS5D0>

Video example 4

<https://www.youtube.com/watch?v=bwKCK3W-96E>



**WHEN
MUSIC THERAPY
HAPPENS, MUSIC
PERMEATES
EVERYTHING IT
TOUCHES**