EXPRESSIVE THERAPY IN THE DIGITAL ERA:

A PILOT STUDY ANALYSING TEAMLAB COLLECTIONS

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Abstract

No one can deny that new technology has penetrated society and influenced human behaviour. The digital medium promises to be an important tool in the psychotherapy domain. This study aims to evaluate the feasibility of the digital medium as a basis for expressive therapeutic tools and provide possible advice for mental health professionals. This paper discusses the topic by analysing and comparing expressive therapy and a few digital art works by a world-renowned digital art company, teamLab. It first introduces pertinent background knowledge, followed by five relevant case studies. The last section will explore potential directions for future researchers and practitioners.

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Aims and Objectives

At the beginning of this year, I got a chance to work with a group of teens who have been excluded from mainstream schools based on various reasons. The task was supporting young people to engage in creative activities, which included drawing, acting, and writing. Although some of the young people were willing to participate and showed passion in their work, a high proportion tended to be distracted and easily bored. It led me to wonder, as digital media art continues to pervade culture, could this be applied in the therapeutic context? Would digital art increase the willingness among the younger generation to engage in creative activities? To date, the study of applying digital medium to expressive therapy remains inadequate, and is mostly hypothetical or theoretical research rather than practical study. Thus, it is easy to infer how rare this new media has been adopted in actual expressive therapy practice. Despite this, I have a strong feeling that using digital art for wellbeing is the future. The goal of this paper is to provide suggestions for therapists or any other mental health professionals to adopt new technology as a therapeutic medium.

Introduction

As technology advances, digital media has been used extensively in many ways (Frich et al., 2019; Garner, 2016; Kim, 2018; Malchiodi, 2018). More healthcare professionals are starting to apply digital technology in their practice (Malchiodi, 2018; Storjohann, 2019). In addition, new media art is now a museum favourite and has become a sensation in public. A Japanese artistic company, teamLab represents one of the most

successful groups in this field. The company believes that digital technology has the power to expand art expression and reform the relationship among people (teamLab, 2016a). Expressive therapy, however, as the combination of the domains of mental health and creative art, has yet adopted digital application on a wide-scale, based on a variety of obstacles. In this paper, I will try to evaluate the possibility of applying digital media in expressive therapy by analysing the collections of teamLab.

The rest of this paper is divided into three sections. The first section, *Expressive Therapy in Digital Era* is the systematic review of the topic of expressive therapy in the digital era. It unfolds the theme by introducing 3 W and 1 H questions. *What* is digital expressive therapy? *How* does digital technology influence expressive therapy? *Why* has the therapeutic community been slow to adopt digital applications? *Whom* does it benefit? The second section, *Dissecting teamLab* will explore the theme further by specifically analysing teamLab's works. Before delving into the case studies, a brief introduction of this selected art company, as well as some essential knowledge and tools for analysis, will be provided. Five selected cases are disscussed, including: 1) *Flowers Bombing*; 2) *Circle, Infinity Circle - VR*; 3) *Sketch Piston - Playing Music*; 4) *Interactive Projection Mapping at Saga Castle! Hop, Step Jump!*, and 5) *Play! Programming for Geniuses*. The five projects will firstly be anatomized respectively and then compared and discussed collectively. The last section, *Future Direction* is the prediction of possible expansion of digital application within the field.

1. Expressive Therapy in Digital Era

1.1 What?

What is digital expressive therapy? According to the online Cambridge Dictionary, the word digital indicates “using a system that can be used by a computer and other electronic equipment, in which information is sent and received in electronic form as a series of the numbers 1 and 0” (“digital,” n.d.). The following term, expressive therapy, also called expressive arts therapy, is a category of psychotherapy where advocates use a creative medium to conduct treatment. It emphasises cross mind-body integration and provides an alternative expression which is especially suitable for patients who don't feel easy in conventional talking therapy. Expressive therapy is a general term for various therapies, usually including art therapy, music therapy, drama therapy, play therapy, and dance/movement therapy. Although each field has its own expertise, much of the time they overlap; because according to the theory of poly aesthetics, “all of the sensory and communicative modalities exist within each art form...Each art form contains within it the seeds of the other arts through aesthetics and sensory perception” (Estrella, 2005, p.193, as cited in Storjohann, 2019, p.4). By combining the two definitions, digital expressive therapy represents the application of computing technology as a creative medium to conduct psychological treatment or to support communication within the therapeutic process.

Not until the recent decade have expressive therapy professions started facing the trend of digital adaptation. However, late in the last century, a small number of expressive therapists had already noticed the potential of applying the computing technique in treatment and had tried it in their practices. In 1985, merely a year after Macintosh was

introduced to the world (“Macintosh History,”n.d.), Diane Weinberg (1985) adopted the computer as a supplement in her art therapy treatment for patients with physical limitations. She noted that “computer art therapy offers an unusually novel and rapid approach to successful art experience” (Malchiodi, 2018, Chapter 1, The Twentieth Century: Computer-Mediated Art Therapy, para. 3). She also mentioned the potential benefit of computer creation in research and investigation: it allows researchers to monitor the cognitive response from patients (Malchiodi, 2018). Although the technique could now be deemed simplistic and outdated, what Weinberg observed in computer art therapy remains true today.

After Weinberg's study, the number of expressive therapists who have become interested in digital tools has increased along with the spread of new technology (Carlton, 2016; Malchiodi, 2018). However, digital application seems to face resistance within the field (Barber & Garner, 2016; Malchiodi, 2018). The following section will dissect the topic in detail.

1.2 How?

How does digital technology influence expressive therapy? Digital tools have an impact on both our cognition and behaviour (Belkofer & McNutt, 2011; Carlton, 2014, 2016; Kapitan, 2009; Malchiodi, 2018). “The current ubiquity of powerful digital devices capable of producing high-quality imagery with elemental operating skills has made it possible for people everywhere to generate expressive images” (McNiff, 2018a, Art Therapy Applications of Digital Art Media, para 3). As an art therapist, Cathy Malchiodi

(2018) noted in *The Handbook of Art Therapy and Digital Technology*, new technology could influence art therapy practice in two ways. First, it has an impact on communication. Second, it can be used as a creative tool (Malchiodi, 2018). The following paragraphs will discuss the question of *How*, using Malchiodi's approach as a starting point.

- **Digital communication**

> *"Every day, we can effortlessly connect to others and information all over the world through the many, many art therapy sites and resources that social media makes possible. Social networking has also created opportunities for connection, community, and creativity that quickly expand beyond our physical classrooms, workplaces, studios, hometowns, and countries, inspiring new ways of interactivity for art therapists."*
>
> *— Gretchen M. Miller (2017, Introduction, para 1).*

Digital connectivity has formed a new community, acting in parallel with reality (Miller, 2017). The proliferation of mobile devices offers immediate and distance-less communication (Sajnani, 2020). Utimately, technological development has influenced the way people transfer information and has changed how people socialise (Malchiodi, 2018).

Digital connectivity in the creative therapy field was first applied in the interaction between professionals in the field. In the mid-1990s, the art therapy community started to use online platforms to share information and experiences, to build connections and to discuss a variety of topics (Malchiodi, 2018; Miller, 2017). These

had the positive effect of allowing therapists to offer better treatment. At that time digital connectivity had not yet widely been used by the public. Yet, over the past two decades, online communication has become ubiquitous. Today, the territory of digital application in the mental health arena has extended from experts' interaction to practitioner-patient communication and peer support. More and more mental health professionals are dedicating themselves to the study of telehealth— applying telecommunication to promote equality of healthcare or any sort of health-related services (Malchiodi, 2018; Walls, 2018). And edgy technologies such as virtual reality (VR), augmented reality (AR) and mixed reality (MR) have been brought into the discussion (Hacmun et al., 2018).

Cyberspace, as a communication platform, enhances the immediate sensory experience through symbolic icons, but decreases actual physical engagement (Carlton, 2014; Miller, 2017). Skeptics warn that the advantages of tech-utilization in the therapeutic realm could be overwhelmed by the disadvantages or even cause damage (Carlton, 2014). At the same time, issues of ethics, confidentiality and privacy arise alongside the convenience of online connections (Carlton, 2016; Garner, 2016; Malchiodi, 2018). The ethical question of boundary setting is a long-standing topic in the mental health area that results in the inconsistent application and development of rules. The uncertain and borderless nature of cyberspace makes it even more difficult for professional boundaries to be set (Belkofer & McNutt, 2011; Carlton, 2016; Malchiodi et al., 2018). In the past, clients had to contact therapists via an intermediary organization. Now, patients can circumvent the intermediary and easily find their therapists on social media site like Facebook. The standards for online ethics have been unable to keep up with the rapidly expanding

territory and demography of social media. And this has put pressure upon therapists who have to evaluate the situation with unclear guidelines and limited support.

- **Creative tools**

The evolution of artistic expression is often influenced by technological advancements (Hacmun et al., 2018). New technology provides various novel methods for people to engage in creative expression (Malchiodi, 2018; Valer et al., 2020), and digital devices have been described as orthodox expressive tools in the 21st century (Darewych, 2018). Graphic design, for example, represents a great example of how digital technology has reformed the world of visual art (Garner, 2016). Today, almost every creative professional uses at least one type of creative software, such as Adobe Photoshop or Illustrator ("Adobe fast facts," n.d.). In fact, the name of the software has been widely used as a verb— to photoshop is "to alter (a digital image) with Photoshop software or other image-editing software" ("Photoshop," n.d.). In addition to visual art, digital technology has also changed the way music is made. The "theoretical and technical difficulty" of practising music had blocked many people from the joyful world of musical creation (Frid, 2019, p. 2). People nowadays do not have to spend ten years practising a musical instrument in order to create melody. If they sing out of tune, they can hire a virtual singer to sing for them with voice synthesiser software. As the technology of animation and face synthesis advances, it is rational to predict that, shortly, everyone can direct their own movie without a cast. All of the depictions above represent examples of creation using certain well-developed software. These programs are well designed and easy to use. Nevertheless, they somehow confine users within a specific art form.

A recently rising art movement “creative coding” has tried to break down this barrier. Creative coding indicates using “computer coding for artistic purposes” (Garner, 2016, Introduction, para 13). It touches on the core of digital creation. The creative process is based on “coding”— the language of the computer. Because creators can express themselves in computer language, they can access every field that has been digitalised. Alongside creative coding, another digital method in the modern creative community is physical computing, “an approach to computer-human interaction design that starts by considering how humans express themselves physically” (Igoe, 2018, para 2). Both creative coding and physical computing lay at the core of the selected case, teamLab, in this paper.

1.3 Why?

Why has the therapeutic community been slow to adopt digital applications? Although there seems to be a gradually increasing amount of study within the field, compared to other industries the application of digital technology to creative therapies is relatively slow (Carlton, 2014; Kim, 2018). In the field of art therapy, Natalie Carlton (2014) summarized three reasons behind the phenomenon of this digital divide. Firstly, it could be attributed to the long-lasting rivalry over the relative value of art and science (Carlton, 2014; Kapitan, 2007). Secondly, certain therapists might have a negatively emotional response toward technology. Lastly, the cost of both hardware and software installation is too high and new technology quickly becomes outdated (Carlton, 2014). Also, certain therapists are reluctant to embrace digital tools based on their concerns about its tactile qualities and therapeutic efficacy in comparison to conventional media.

- **Art vs. science**

The debate between whether arts or sciences are superior is endless. Certain mental health professionals believe that over-using a computer causes "de-evolving humankind into overly rational, socially inept" and forces people to "revere reason and eschew emotion" (Carlton, 2016, para 3).

Anti-techno is a common phenomenon in the field of art therapy. Brian Austin (2009) explained the phenomenon via a historic point of view by introducing the ideas of two scholars, Lewis Mumford (1952) and Richard Sennett (2008). Mumford stated that technology invention helps people control their surroundings and rid themselves of the unrealistic beliefs of symbols and supernatural power that may eventually lead to madness. However, over-relying on machines could cause regression of internal feelings and force people back toward pre-machine creativity. He suggested that "positioning creativity as something found only via non-technological means,...ignores technology's capacity to give form to imagination" (Austin, 2009, p. 84). About half a century after Mumford, Sennett, a sociologist, expressed his concern for the use of computers in creation. He feared that digital precision may cause artists to lose their sense of human scale. In sum, Mumford and Sennett alike declared the conflicting relationship between technology and art and thought that technology represents an obstacle to creativity (Austin, 2009). However, it has to be remembered that technology and creativity are in a complementary relationship (Kapitan, 2007). Overly prioritising the hand over the machine, which is the attitude of some art therapists, is inappropriate. People shouldn't undervalue the contribution of technology in the creative process (Austin, 2009).

- **Technophobia**

A large proportion of expressive therapy practitioners' knowledge about the potential of digital tools is limited, and they are often overwhelmed by the various digital products in the market (Malchiodi, 2018). The hesitation of applying digital applications in expressive therapy could be caused by therapists' own fear and anxiety toward new technology (Carlton, 2014; Kim, 2018). Personal experiences could sometimes foster the anti-techno attitude. Therapists may have negative feelings towards digital media and new technology due to their frustration of learning digital skills (Carlton, 2014). Currently, a huge number of expressive therapy practitioners developed their practice in the time with limited digital exposure. They had less opportunity to access digital tools during their professional training than those working today.

Indeed, learning a new skill, especially new technology, takes time and could be disheartening at the beginning. Yet, once familiar, people are usually surprised by the vivid imagination potential offered by the new tool (Garner, 2016). "What is familiar to us is comfortable and feels secure, but the disruptive nature of change is unavoidable. Rather than fearing that our work will be subsumed by technology, we need to be adaptive and open to new ways of providing care. Our work is still relevant" (Magnavita, 2018, as cited in Stone, 2020, p.3).

- **Tactile sensation of digital media**

Some of the debate focuses on that haptic feedback of digital tools (Malchiodi, 2018). Certain therapists claim that computational tools lack essential tactile qualities (Hinz, 2016), while others deem that digital tools provide different tactile features

that cannot be offered by traditional material. For instance, the tablet allows people to draw delicate pictures with either their fingers (McNiff, 2018a) or a stylus. This might influence the feeling of the creative process due to the *reflective distance* (see Section 2.2). Indeed, the sensory experiences of digital creation are fairly distinct. However, some individuals do benefit from this unique experience (Malchiodi, 2018).

In 2016, Dustin Yu, an art therapist depicted positive haptic feedback he has experienced from computers in his thesis research. He stated, “Via our hands, we are able to feel the keys through our fingertips, which are one of our most sensitive areas according to the concept of the cortical homunculus. As we type, we create a symphony of sounds and rhythm in our synchronized and coordinated tapping. As we type, we feel the “bump” of the F and J key as the default hand position, we feel the vibrations that the keyboard creates and how it reverberates into the platform we have it on, and we feel the physical warmth of the device’s heat source. Taking a personal view, I think about the oddly satisfying feeling in experiencing the space and gaps between keys. I sometimes even think about the pressure and release of how keys instantaneously bounce back” (Yu, 2016, as cited in Carlton, 2016, Sensory qualities of digital media, para 3). In addition, many wearable or hand devices, e.g. VR controllers or bodysuit, provide immediate haptic feedback (vibration) to match virtual experience to the real physical impact (Lohrius & Malchiodi, 2018; Stone, 2020).

Nevertheless, albeit the cases above describe the positive effect of tactile sensation, they overly simplify the variety of hapticity into one or two specific responses

(touching screen or vibration etc.). Perhaps, the argument that “digital creative tools lack tactile sensation” is wrong and has to be changed to “digital creative tools lack a sufficient variety of tactile sensation”. The discussion will then become “how could we diversify the tactile sensation of digital media?" rather than whether we should embrace digital tools or abandon them.

- **Therapeutic efficacy of digital tools**

  The efficacy of treatment influences practitioners decision whether to implement a specific therapeutic method. Many therapists doubt the reliability of the therapeutic effect of digital art (Garner, 2016; Kim, 2018). They worry that people may produce art by simply pressing a button (Garner, 2016). The truth is it is just different from the traditional method, and there is no evidence that “press-button art” has no therapeutic effect or has caused harm. Furthermore, it is overly simplified to equate digital tools with “pressing a button”. As previously mentioned in Section 1.2, Creative tools, there are various ways to apply digital media in creation. It could be simple as clicking the mouse to place predesigned pictures, or complex as creative coding.

  In fact, the argument over therapeutic efficacy is pointless. There is still ambiguity within the assessment of any form of mental therapeutic efficacy because the progression is nuanced and hard to measure. However, using digital tools have shown the potential of systematising the therapeutic process, which can be further applied to the evaluation of efficacy. The computational technique, such as "artificial intelligence, expert systems, computer algorithms, and statistical models" (Kim, 2018, Computer Technologies as a Solution, para 2) helps distinguish the nuance and

analyse the trend. The third section of this paper, Future Directions, will discuss this in further detail.

1.4 Whom?

Whom does it benefit? Although the answer is potentially everyone, evidence shows that patients, who are participants in digital culture, report positive experiences when therapists applied new media to the treatment (Carlton, 2014). Most mental health workers recognise the importance of honouring clients' culture (Barber & Garner, 2016; Stone, 2020). As stated by Penny Orr, "For art therapists to understand clients, they must appreciate the context of clients' everyday lives. The everyday lives of clients increasingly involve digital media and its creation of a visual culture" (Orr, 2010, as cited in Barber & Garner, 2016, para 1).

Narrowing the scope to see which age group embraces the digital culture participants most, the young people most lean into appreciating digital media and technology. This special connection was first addressed by an art therapist, Devorah Canter (1987, 1989). She found that computer communication, rather than other contexts, works well with young people with learning disabilities (as cited in Malchiodi, 2018). Young people are not only attracted by the novelty of new technology but were born and grew with them. They are the so-called "digital natives" (Prensky, 2001, as cited in Malchiodi, 2018, Chapter 1, The Twenty-First Century: Digital Art Therapy, para. 3). Certainly, as noted in the last section, there are generational divides. Yet, "If we overcome our initial discomfort with change, we will be able to explore and play with new ways to integrate

technologies that our clients, especially children and adolescents, have most likely already learned and utilized on a daily basis" (Wolf, 2014, as cited in Storjohann, 2019, p.11). Although applying digital media to treatment helps increasing young people's willingness for participation, studies have shown that overexposure to electronic screens at an early stage of development could cause long term brain damage. Scientists warn that children under 18 months should not access to any forms of electronic screens, and the screen exposure should be limited to an hour per day until the age of six (Malchiodi, 2018).

Another group with perceived benefits from the digital application is those who would not be able to access creative therapy due to certain physical difficulties. For instance, the eye-tracking system allows paralysed patients to paint (McNiff, 2018a). The neuro-technology has enabled patients with optic nerve damage to "see" by sending electronic visual signals to the cortex (Juskalian, 2020). Customized musical instruments provide unusual ways of music-making which could skip hand performance and convert brain waves directly into music (Frid, 2019; Leslie, n.d.).

A postdoc researcher specialising in digital musical instruments, Emma Frid, notes that "technology could be considered an extension of the body; a malleable tool that can be used by persons with restricted mobility or cognitive problems in order to stimulate self-expression, creative composition, and motor rehabilitation" (Frid, 2019, p.4). Outside of people with physical impairments, Frid also mentioned the capacity of applying digital expressive treatment to patients with autism spectrum disorders. Because computational tools enable partitioners to manipulate how much stimulus (colours, sounds, vibrotactile feedback etc.) are provided, it may benefit autistic patients, who have hypo- or

hypersensitivities (Frid, 2019). Interestingly, in the case of hypersensitivities, the limited tactile sensation seems to be a positive feature.

In addition to the groups above, the digital expressive therapy application has been proven successful in hospitalized patients (Barber & Garner, 2016). Unlike traditional media, digital tools are organized, tidy and easy to sanitize. And its mobile convenience has made it optimal for bedside use (Kometiani, 2018). Additionally, in most clinical settings, tech-savvy clients may expect service givers to be technologically capable and trained. Olena Darewych, an art psychotherapist, claims that it is an “ethical obligation” for practitioners and relevant agencies to “remain current with new clinical theoretical frameworks, tools, and interventions” (Darewych, 2018, Conclusion, para 1).

In sum, young people are naturally familiar with digital tools. For many of them, conducting digital expressive therapy could encourage participation and increase the feeling of understanding. The practical advantage of digital application makes it appreciated in hospital settings, and its customisable nature could potentially help patients with particular disabilities. The next chapter will focus on the selected digital art company, teamLab, which is also concerned with young people. This paper will continue to explore the potential of digital application in expressive therapy by analysing their works.

2. Dissecting teamLab

2.1 About teamLab

Established in 2001 and blooming over the following two decades, teamLab— a Japanese art collective— has become one of the most popular new media art groups in the world (British Council, n.d.; teamLab, n.d.a). Their works are part of the permanent collections of several museums and galleries in different countries (teamLab, n.d.a). In 2018, the company collaborated with an urban developer to establish its own permanent digital museum— teamLab Borderless (British Council, n.d.; Mori Building Co., Ltd. & teamLab, 2019), which is reported to be the world's first digital museum (British Council, n.d.; Esa, 2020). The site has attracted 2.3 million visitors of more than 160 different nationalities in its inaugural year (Mori Building Co., Ltd. & teamLab, 2019; Rea, 2019) and has brought 50% more tourists to the vicinity (Mori Building Co., Ltd. & teamLab, 2019). In addition, teamLab is especially appealing to the young generation; as can be validated by the data on Instagram, a popular social media application with the young. As of September 2020, there are over 229K followers on teamLab's official Instagram (teamLab, n.d.b), and the number of Instagram posts with the hashtag #teamlab is an astounding 634K ("#teamlab," n.d.), which outnumbers that of #britishmuseum (562K; "#britishmuseum," n.d.).

Alongside art exhibitions, teamLab launched a brand new idea to combine digital art with education, called Future Park. The company has observed that, within the current educational context, people tend to be individual-centric and overly emphasise one correct answer. Hence, they believe that joyful co-creation projects could facilitate cooperation and allow people to embrace diversity (teamLab, n.d.c).

According to the website of teamLab to date, the company self-presented nine main concepts as guidelines in generating new works. These include 1) digital art; 2) ultrasubjective space; 3) relationship among people; 4) digitized nature; 5) transcending boundaries; 6) body immersive; 7) time continuity; 8) co-creation and 9) body active perception (teamLab, n.d.d). TeamLab believes that digital tools have the power to expand art and to form new relationships among people (teamLab, 2001). Their works transform the common perception of the museum. Traditionally, the border between displayed art pieces and visitors is absolute. TeamLab breaks the rule by bringing creation away from the constraints of the picture frame. Visitors are able to interact with the works and become part of the creation. Kenji Yoshida, the curator of National Museum of Ethnology in Japan, comments that perhaps we should determine those who participate in the creation as “characters” instead of “visitors” (Yoshida, 2019). One of the most important reasons why this paper chose teamLab as the research target is because the company values human interactions, which is also emphasized in expressive therapy. TeamLab makes digital creation friendly to the public and a more intuitive tool for therapists to adopt Magnavita's idea of “be(ing) adaptive and open to new ways of providing care” (Magnavita, 2018, as cited in Stone, 2020, p.3).

2.2 Some Background Knowledge

Before delving into the individual cases, the expressive therapies continuum (ETC) is essential, foundational knowledge. The following are a brief introduction of ETC and certain terms and concept related to the ETC model.

Expressive Therapies Continuum

Expressive therapies continuum (ETC) is a theoretical framework which is usually used to guide art therapists in their conduct of treatment (Hinz, 2009; Lusebrink, 2010). The coming section will be largely based on this theory. ETC was first introduced by Kagin and Lusebrink in 1978 and Lusebrink had further developed it in the following years (Hinz, 2015). Integrating Piaget's theory of cognitive development, Kagin and Lusebrink classified the interaction between humans and the creative medium by information processing, and they eventually developed this hierarchical, continuous model (see Figure 1; Hinz, 2009; Kagin & Lusebrink, 1978).

Fig. 1 Expressive therapies continuum

ETC has two axes, vertical and horizontal. The vertical axis represents a simple-to-complex process, while the horizontal axis is a polarity spectrum, which Kagin and Lusebrink attributed to the function of the left/right brain hemisphere. The vertical axis is divided into four levels. The bottom-up sequences are the Kinesthetics/Sensory level, the Perceptual/ Affective level, the Cognitive/Symbolic level, and Creative level on the top. The terms in front and after the "/" indicate the left and right brain functions respectively (Hinz, 2009; Kagin & Lusebrink, 1978). Further descriptions of each level are necessary. Although today's evidence has shown that the brain connection is more complex than the simple division between left and right, the ETC model is still useful in the understanding of the creative process.

- **Kinesthetic/Sensory level**

  The Kinesthetics/Sensory level in the first level refers to the sensorimotor stage of cognitive development. In this stage, people try to control their bodies and gain information to experience the world. Thus, all their focus is on movement and the five senses (Hinz, 2009; Ray, 2011). A creative process inclined to the Kinesthetics end contains body motion with strength and rhythm, such as scribbling with crayons or tapping on clay. People may feel a sense of release and satisfaction via these kinds of activities. On the flip side, people who create on the sensory end of the spectrum find peace in immersing themselves in sensory input. The sensory activities include mixing colour with watercolour (sight), making sounds with plastic paper (hearing), or kneading clay (touch) (Hinz, 2009).

- **Perceptual/Affective level**

  The Perceptual/Affective level, the second level, corresponds to the schematic stage, which is sometimes named the pre-operational stage. In this phase, people will develop the capacity to recognise form and category (Hinz, 2009; Ray, 2011). At the same time, they become able to accept unfamiliar affection. People start to recognise structure and pattern (perceptual) and try to distinguish the emotion contained in the image (affective). Different from the Kinesthetics/Sensory level, which focuses on experiencing, creation at this level demonstrates a certain extent of expression. Although the images in this level could be somehow scattered and messy, there are certain readable elements which therapists can use as a base to uncover the underlying issue (Hinz, 2009).

- **Cognitive/Symbolic level**

  The corresponding developmental stage of the Cognitive/Symbolic level is the formal operational stage. People in this stage are able to process abstract concepts with sophisticated cognitive function (Hinz, 2009; Ray, 2011). Creation requiring complex processes usually falls into this level. And it often involves verbal explanation. The Cognitive component focuses on developing logical thinking and problem-solving abilities, while the Symbolic component is related to imagination, intuition and mythic thought. A cognitive creative process is about planning, which usually comprises classification, comparison and sequencing. This helps patients enhance rational thinking and further relate the experience to their real lives. The Symbolic component, on the other side, includes a lot of reinterpretation and reflection, which helps the individual understand personal meaning and form their own identity (Hinz, 2009).

- **Creative level**

  The Creative level represents the final stage, accomplishing a balance between all aspects. It is the synthesis of all ETC components. Although the structure of the ECT model seems to imply that the high-level components privilege the low-level ones, truthfully, they are equally important. The human needs to possess all aspects of the ETC function to pursue wholeness (Hinz, 2009).

Media Dimension Variables

About ten years before ETC was created, Kagin presented the idea of Media Dimension Variables (MDV; Kagin & Lusebrink, 1978). It could be regarded as a supplemental

concept to ETC. MDV is an exploration of the characteristics of art media and the characteristics of the creative task. Kagin defined three main effects of the process of art therapy, which are 1) Complexity; 2) Structure; 3) Physical Properties (Kagin & Graves-Alcorn, 2017; Kagin & Lusebrink, 1978; Hinz, 2009).

- **Complexity**

  The complexity in an art therapy process indicates how complex it is to execute the creative operation. It usually means how many steps an individual needs to take to accomplish his/her work (Kagin & Graves-Alcorn, 2017; Hinz, 2009). A creative process with a high level of complexity often implies that it works in an upper level of the ETC model (Cognitive/Symbolic level).

- **Structure**

  The structure in the MDV involves directives and specific responses. Operations with a high proportion of structure emphasise precision and will compress the space of free expression. However, it helps improve the capacity of cognitive function (Kagin & Graves-Alcorn, 2017; Hinz, 2009).

- **Physical Properties**

  Based on the expressivity of media, Kagin created a continuum system from resistive to fluid to categorise art materials. Watercolour, for example, is located on the fluid side, and the opposite would be a pencil. Resistive media are more likely to promote inner construction which corresponds to the left side of the ETC model while fluid media would evoke components on the right side such as affective response (Kagin & Graves-Alcorn, 2017; Hinz, 2009, 2016).

Boundary/ Quantity Determined

In 1978, Kagin and Lusebrink further extended the concept of physical properties that a media can be sorted by boundary-determined or quantity-determined. The former offers the feeling of safety while the latter facilitates affective expression (Kagin & Lusebrink, 1978; Hinz, 2009, 2016). Examples of boundary-determined media include a block of wood (for carving) or a sheet of paper. Crayons and paints, in contrast, are quantity-determined (Hinz, 2009, 2016).

Reflective Distance

Distancing in the expressive arts domain has several meanings. Physically, it refers to the effect caused by the distance between artwork and viewers. From a mental point of view, it indicates emotional detachment. Although these two implications seem to be unrelated, they are actually convergent (Furman, 1988). They both introduce cognitive engagement. The term reflective distance in art therapy indicates that creators are able to give thought during the creative process instead of completely being immersed in the creating experience. To cause reflective distance, mediators are usually required to physically distance the creators and the production. For instance, compared with barehanded creation, using tools such as a brush or a clay shaper creates more reflective distance (Hinz, 2009). Additionally, the notion of distancing is not only used for art therapy but in the field of drama therapy and is commonly called the distancing effect. It describes the effect of a certain technique which separate patients from overwhelmed emotion and enable patients to detach from their ego in an effort to observe the experience from an objective perspective (Furman, 1988).

2.3 Case Studies

The following are the analyses of five teamLab works. These works are selected to best demonstrate the connection between digital art and various therapy manners, as well as survey the diversity of teamLab's presentations. All the cases will be measured with the expressive therapies continuum (ETC) model. Meanwhile, the form of art within the projects will be dissected and collated. After these, I will juxtapose each project with current therapeutic practices to see whether there is potential for further application.

Flowers Bombing

Fig. 2 teamLab 2018. *Flowers Bombing*

Flowers Bombing is an interactive installation released in 2018. Visitors first receive a piece of colouring paper with a flower figure. After visitors finish the picture, the assistants will help to scan the painted flower, and the newly created flower will blossom on the wall by projection. Meanwhile, the projected flower becomes a new brush for creation. It blooms and dies from visitor hands (see Figure 2; teamLab, 2018).

The whole process from colouring figures to using a flower brush to create seems to be complex. However, if regarding the project as two separated parts, each of them is simple. In the first part, colouring flowers, the media provided in the actual exhibition is crayons. In the physical properties of the MDV system, crayon is located around the

middle of the resistive-fluid continuum, yet more close to the resistive side, which is theoretically related to inner construction. The paper with the flower outline is boundary-determined, which provides a sense of being contained and being safe (Hinz, 2009, 2016). While colouring, participants need to identify the boundary and maintain awareness. It presents a high level of structure. According to the information above, the first part of this project, flower colouring is low in complexity, high in structure, resistive and with a certain proportion of reflective distance (using crayons). All of these reveal that the first part should be attributed to the Perceptual component in the ETC model. The healing feature of perceptual expression is related to confining power. It helps reorganise messy and overloaded emotion by adding barrier and structure (Hinz, 2009).

The second part of the project is to scribble with the pre-designed flower brush. In the case of the structure of the MDV, scribbling on walls could be considered to be low-structured, which means participants have much more freedom for expression. Besides, the digit-visual effect of blooming colour is similar to watercolour and pastel, which could be regarded as fluid media. Interestingly, unlike watercolour which requires a brush to be rendered, participants control the flower pigment without a mediator. This implies that the reflective distance in this case is low, which may further pull the ETC functions to the right. When appearing on the wall, the gently blooming flower stimulates visitors' visual sense. As hands wave, the petals and leaves scatter in an array of lively colours. They cross each other, causing a strong visual impact. All of these introduce the Sensory component of the ETC. Sometimes, the process may move upward to the Affective component because the intense colour evokes strong emotions from the visitors. Additionally, in order to gain more visual stimulation, visitors may

amplify their motion. This then redirects the ETC process from the Sensory component toward the Kinesthetics pole (see Figure 3).

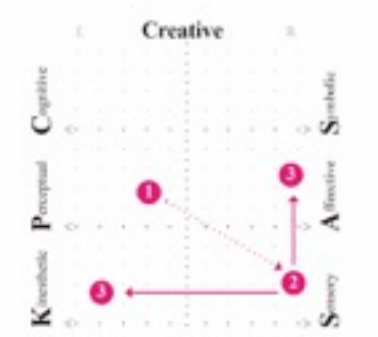

Fig. 3 Flowers Bombing (ETC)

Fig. 4 Flowers Bombing (Art Forms)

Engaging with *Flowers Bombing* could be regarded as a visual-art dominated process with a small proportion of music and movement (see Figure 4). The music is generated by the system, which is common to almost every teamLab work. Gentle melodies play once the flower appears on the wall. This is a subtle change that most of the time visitors do not even notice and regard as simply background music. However, even the background has a healing effect. Music can help distract from discomfort or fatigue and maintain attention (Gfeller, 1995). In addition, within the project, there is also a healing effect caused by the locomotion associated with drawing. Unlike conventional painting defined by a clear edge (typically a piece of paper or canvas), participants create with borderless projection. As mentioned previously, interacting with the flowers leads to outward-oriented movement. This helps physically improve constricted postures, which are often related to negative status and low self-esteem (Körner et al., 2019). Further, it takes time for the flower-animation to grow, which forces participants to slow down their movement and so ease their mood. Combining music and movement causes a multiplying effect. This is called the auditory-motor entrainment effect, which means

when the sound is repetitive in a rhythmic pattern, the activation effect will arouse the action nerve and muscle response pattern in a predictable time structure (Gfeller, 1995).

In sum, the project fits in the domain of art therapy. It first works on the perceptual side of the ETC and moves rightward to the sensory and affective side. This offers a procession from control and security to emotional and releasing expression. It is especially suitable as a starting activity for patients who feel anxious and insecure. As an art therapist, Bruce Moon (1998) said, “the hardest day in the art therapy group was their first one. They stood staring at the blank piece of paper, overwhelmed by all the possibilities and all of their insecurities. There were so many options available when the paper was untouched; the potential was endless and their feelings were chaotic” (Moon, 1998, p.216). Besides, a fundamental element of teamLab's collection is that the output looks comprehensive and aesthetically pleasing from the very beginning. This aesthetic experience will naturally guide patients to outlet their emotion and movement.

Circle, Infinity Circle - VR

Fig. 5 teamLab 2016. *Circle, Infinity Circle - VR*

Circle, Infinity Circle is a VR creation project. It is part of teamLab's Spatial Calligraphy series, which reinterprets traditional eastern calligraphy in a three-dimensional manner. Participants will experience painting in a virtual pond filled with swimming fish. Besides the virtual environment, there is a large screen simultaneously providing other visitors who are not wearing a head-mounted display (HMD) the opportunity to observe the creating process (see Figure 5; teamLab, 2016b).

In evaluating this project with the MDV, the project is low in both complexity and structure, which could be inferred to the lower level of the ETC. The physical properties of this VR media are close to the resistive side. Although it seems to mimic the characteristics of ink wash painting, the flow of ink is confined. The ink is dense and the strokes are clear. Moreover, owing to the stroke brush being controlled by a handheld device (mediator), the reflective distance is high. Both physical properties and reflective distance of VR Calligraphy point to the left side of the ETC model, and the left side of the lower level of the ETC is the Kinesthetic component. As teamLab depicted in its website, "it reconstructs Japanese calligraphy in 3 dimensional space and expresses the depth, speed and power of the brush stroke" (teamLab, 2016b).

Although the ETC process of this project is very kinesthetics-centric, in the beginning, the experience could start with the sensory function. Participants might be distracted by the immersive experience of being in the water, staring at the animated fish or listening to the sound of moving water. After getting used to the virtual environment, people enjoy waving the controller to draw and explore the kinesthetic experience (see Figure 6).

The art forms of this project contain both visual art components and dancing/movement traits (see Figure 7). The creating process is filled with rhythm and body movement. It could be seen as a 3D version of scribble drawing, which is a common art therapy method. Like the line of scribble drawing on paper representing the record of hand movement (Lu, 2016), the spatial stroke demonstrates the notational documenting of the body-motor path. People dance to draw. The virtual strokes are visually similar to ribbon dance, which is a tactic used by dance therapists to extend clients movement and arouse their imagination (Capello, 2018). As stated in the 2018 research of *The Principles of Art Therapy in Virtual Reality*, "The creation itself involves hand and/or full body movements stimulating an embodied experience. This encourages the artist to extend his expression from the typical finite canvas in front of her, to form boundless environments in 360◦ around her" (Hacmun et al., 2018, p.2).

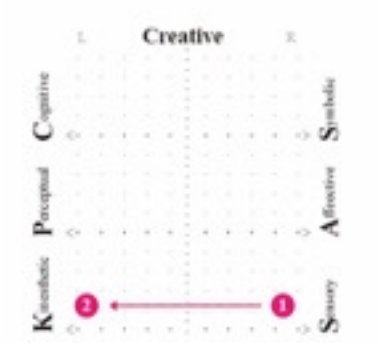

Fig. 6 Circle, Infinity Circle - VR (ETC)

Fig. 7 Circle, Infinity Circle - VR (Art Forms)

Virtual Reality (VR) is not a common element in teamLab's exhibitions. The reason for this could be attributed to the limitation of equipment, such as the imbalance between the numbers of devices and visitors, which may leave many visitors feeling excluded. However, VR creation as a combination of 2D (painting and drawing) and 3D (sculpture) ignores physical laws, such as gravity or material condition, and provides a novel expressive experience (Hacmun et al., 2018; Lohrius & Malchiodi, 2018). The

plasticity of VR creation is high and envisions future creation that the company wants to embrace.

There are several benefits of applying this sort of VR technology in the expressive therapeutic context, which stands out from conventional therapy. VR offers a new way for therapists to observe the creative process by shifting the third-person perspective to the first-person perspective (Hacmun et al., 2018; Lohrius & Malchiodi, 2018). It also enables service givers to track and to record users' interaction, behavioural response, and performance (Georgieva & Georgiev, 2019). Nevertheless, there are downsides to VR creation. First, it could become an obstacle to the treatment. Based on current technical limitations, VR creation lacks tactility. Wearing HMD blocks face to face communication and hinders the therapist-patient relationships (Hacmun et al., 2018). Second, it may cause physical illness and damage. Some participants reported cybersickness, symptoms of temporary discomfort, after being exposed to VR (Hacmun et al., 2018; Weech et al., 2019). Potential physical impacts of VR, including permanent eye disease (Rushton & Riddell, 1999), mean that practitioners have to evaluate each patient's situation cautiously.

Sketch Piston - Playing Music

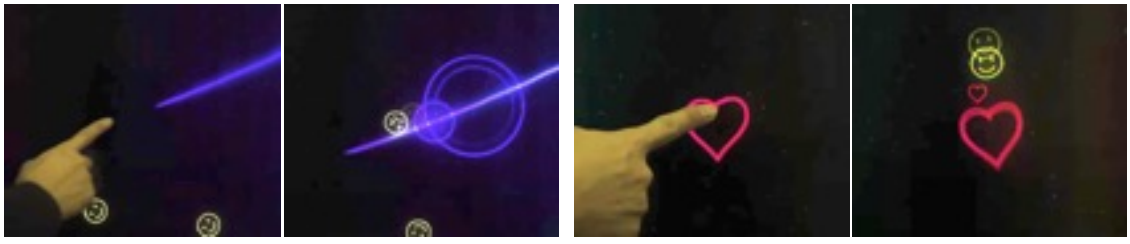

Fig. 8 teamLab 2015. *Sketch Piston - Playing Music*

In the early 20th century, Kandinsky visualised the experience of listening to music (Kennedy, 2007). A hundred years later, teamLab is visualising the process of making music. *Sketch Piston- Playing Music* is a musical-painting instrument in which people can create music by touching the screen. Participants draw lines with their fingers and place "music stamps" to make sounds. Each colour of lines represents a different timbre, and each stamp plays a unique sound effect. The screen represents not only canvas but also music staves. the higher a line placed, the higher pitch it plays while a stamp bounces on it (see Figure 8; teamLab, 2015).

In this project, visual art and music components are equally important. They are merged and support one another. Music, as well as visual art, are powerful expressive formulas which have proved beneficial for wellbeing. Traditionally, making artwork and composing music are completely separate actions. However, teamLab makes them whole; and this project demonstrates the perfect combination of the two elements (see Figure 9).

Fig. 9 Sketch Piston- Playing Music (Art Forms)

The creative process of *Sketch Piston - Playing Music* moves between low and high in complexity and structure. This means that it could function from the lowest ETC level (Kinesthetics/Sensory) to the upper levels or even to the highest level (Creative level). The Physical Properties of this project is resistive, and the reflective distance seems to be low because visitors draw with their fingers. However, touching the board, unlike interacting with traditional material, lacks tactual sensation. Hence, whether it should be identified as low or high in reflective distance demands further exploration.

The ETC route of interacting with this project is diverse because it involves every component of the ETC system. Some participants may start with a more kinesthetic approach. They may scribble randomly without paying attention to the sounds. In contrast, those who execute their work in a sensory manner notice the sounds and try to make more sounds. If these people are stuck in this Kinesthetics/Sensory level, they might be satisfied at the beginning, yet eventually feel bored by the meaninglessness of their actions. Thus, it is better to guide them to move to the next level. Interestingly, most of the participants naturally achieve the Perceptual component of ETC. They are able to recognise the pattern of sounds by themselves and eventually create a recognisable structure without instruction (see Figure 10). Moreover, with proper guidance and enough time to become acquainted, it is fairly possible to further achieve the Cognitive level (see Figure 11), because of the planning nature of musical composition. As Miendlarzewska and Trost said, “The process of music recognition requires access and selection of potential predictions in a perceptual memory system” (Miendlarzewska & Trost, 2014, p.2).

Fig. 10 teamLab 2015. creating recognisable patterns

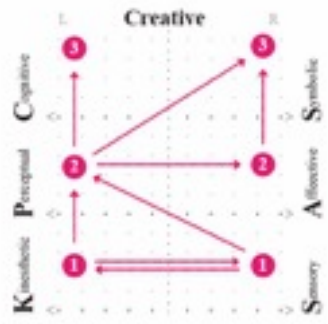

Fig. 11 Sketch Piston-Playing Music (ETC)

The psychological and neuro-scientific professions have proved the positive effect of musical training toward the development of reasoning capacity (Miendlarzewska & Trost, 2014; Overy, 1998). Music benefits an individual’s self-organization and

perceptual awareness due to its structural characteristics (Gfeller, 1995). Listening to music, unlike hearing sounds, involves several cognitive functions, such as “pitch discrimination, auditory memory, and selective attention” (Miendlarzewska & Trost, 2014, p.2). Without these functions, people are not able to understand the structure of tempo and harmony and neither to perceive the affection behind the melody (Miendlarzewska & Trost, 2014).

Music and sound are also highly associated with the right side function of the ETC. As previously mentioned, they promote sensory sensitivity. Moreover, they touch the affective and symbolic components. Music is recognised as highly associated with emotional expression, and has been called the language of emotion (Gfeller, 1995) or the language of feeling (Stone, 2020). Brain imaging study shows that music triggers regions which are related with emotion, e.g. the limbic system. Sometimes, people lack words to express their feelings but music supplements this inability (Gfeller, 1995). Paul Newham (1998) recognises the role of voice and tone in prelinguistic affective expression and notices its diminishment as language competence develops. Musical training, however, can help to regain this ability (Newham, 1998). Music interpretation relates to symbolic function because it requires personal experience, past training, culture and cognitive development. It is a personal thing that where no two people interpret certain musical stimuli absolutely the same (Gfeller, 1995).

Interactive Projection Mapping at Saga Castle! Hop, Step Jump!

Fig. 12 teamLab 2013. *Interactive Projection Mapping at Saga Castle! Hop, Step Jump! teamLabTrampolineCannon!*

This project is an outdoor interactive theatre. The theme of the show is the history of Saga Castle, and it is a projection mapping show projected on the actual historic building. The audiences are able to interact with the show by playing an artilleryman and firing virtual shells. The show is divided into several sections and the interactive sections alternate within the flow of the tale. During the interaction, there are rhythmic drum beats playing as background music. The interactive device is a play-cannon combined with a trampoline, which teamLab named teamLabTrampolineCannon. Participants control the cannon muzzles to take aim and hop to fire (see Figure 12; teamLab, 2013).

There are two effects caused by the cannon. The first one acts like a paintball (see Figure 13). When the virtual shells hit the castle, colours sprinkle on the wall. As more artillerymen fire, the castle is eventually rendered in vivid colours. Another effect is more destructive. The projection causes the illusion that the building becomes twisted and distorted while being bombarded (see Figure 14). While analysing the project under the ETC framework, both presentations contain the Kinesthetic component. Bouncing to the drumbeat is of low complexity yet highly structured because rhythm brings and reinforces rules (Gfeller, 1995). It helps participants to release their inner tension (Hinz,

Fig. 13 teamLab 2013. paintball effect

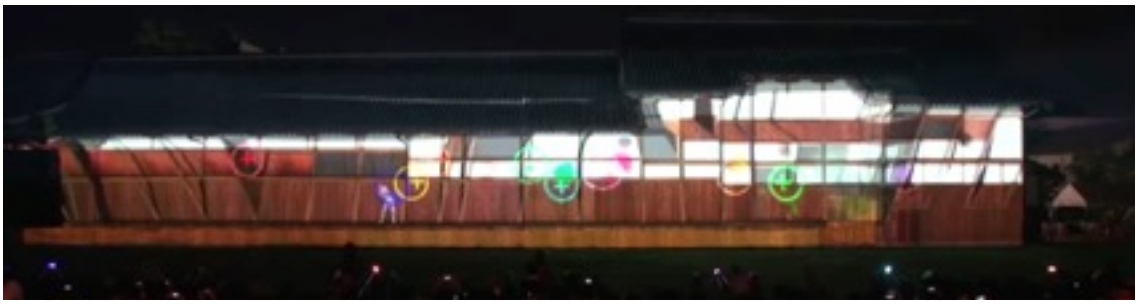

Fig. 14 teamLab 2013. destructive effect

2009). However, the two effects lead in both horizontal and vertical directions. On one hand, the splash painting image caused by the paintball effect stimulates sight sensation which horizontally connects to the Sensory end. On the other hand, the destruction might offer a mechanism to help participants recognise the structure of the building (perceptual function). Additionally, due to the aggressive nature of the activity, sometimes it may directly point toward the Affective component by eliciting the strong emotion of anger (see Figure 15).

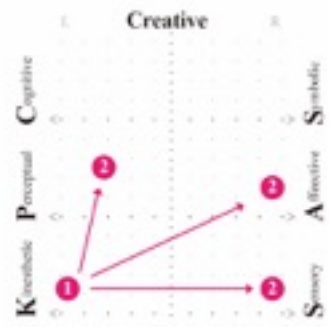

Fig. 15 Interactive Projection Mapping at Saga Castle! (ETC)

Aggressive behaviour is a common phenomenon among children. It is an essential non-verbal expression in the first years of life, and some scholars believe that normal childhood aggression will fade at the point of language development. However, adults often deem aggressive behaviour as unacceptable and will try to prevent or even inhibit it while playing with children (Landreth, 2012; Ray, 2011). Worst of all, recently, the

psychiatric domain has labelled aggressive behaviour as a criteria of mental illness (Ray, 2011). Actually, games that involve aggressive components are crucial in play therapy practice and aggressive toys are widely used by play therapists. It helps children express their compressed negative emotion, such as anger, frustration and fear (Landreth, 2012; Ray, 2011; Stone, 2020; Taylor, 2017); and children are able to explore the topic of power and control through aggressive play (Ray, 2011). Typical aggressive toys include: 1) tools to attack, for example, a toy rifle or a carnivore puppet; 2) tools that could be targeted, such as a bop bag, fluffy dolls and destructible toys (such as Mr. Potato Head). The founder of Center for Play Therapy— the world's biggest play therapy training program, Garry Landreth suggests, "every play therapy experience should contain something a child can destroy" (Landreth, 2012, p.87). *Interactive Projection Mapping at Saga Castle* contains both of these elements— a cannon to fire and a castle to destroy. Because the process of deconstructing the building is caused by the illusion of projection, it is safe and recoverable. Furthermore, there is a common belief within the play therapy domain that the energy of aggression can eventually transfer into creative and productive behaviour (Ray, 2011). And the colourful paintball effect demonstrates the complete process from attacking to creating.

Although play therapy emphasizes free expression, boundary setting is crucial. It adds structure and security to the treatment and offers children the opportunity to learn self-control (Landreth, 2012; Sweeney et al., 2014). In fact, not only play therapy, but any sort of expressive therapy has to be executed within limits, including a spatial boundary, a certain amount of time or rules concerning behaviour.

Interactive Projection Mapping at Saga Castle involves several different creative forms (see Figure 16). As mentioned above, the experience of taking part in the show is filled with playing. Yet, it is still a theatre project with certain visual art elements intertwined. In addition, hopping on the trampolines is a dynamic activity which touches upon body movement. In fact, simply bouncing on trampolines has healing effects. Rebound therapy is a sort of therapeutic exercise using trampoline to help children with profound and multiple learning disabilities (Smith & Griggs, 2009). It has been proven to cause positive change for children with autism spectrum disorder by improving motor proficiency (Lourenço, 2015). Music, in this case, although not directly about creation, promotes engagement and helps maintain muscle function (Gfeller, 1995). As stated in the first case, music alleviates fatigue and attention decline. A quote perfectly demonstrates the role of drumbeat in this project, "When listening to our favorite songs, our body betrays all the symptoms of emotional arousal. The pupils in our eyes dilate, our pulse and blood pressure rise, the electrical conductance of our skin is lowered, and the cerebellum, a brain region associated with bodily movement, becomes strongly active. Blood is even redirected to the muscles in our legs. In other words, sound stirs us at our biological roots" (Lehrer, 2011, as cited in Stone, 2020, p.63).

Fig. 16 Interactive Projection Mapping at Saga Castle! (Art Forms)

Play! Programming for Geniuses

Fig. 17 teamLab 2017. *Play! Programming for Geniuses*

Play! Programming for Geniuses is an education-oriented program which aims to teach children programming in a joyful and creative manner. It starts with creating an avatar by drawing a human figure. After scanning and naming their agents, participants can input commands on a tablet to control the avatar projected on the wall. The wall acts as a stage with a projected image of a prairie which allows multiple activities to happen. Participants can control their avatar to interact with other avatars or with observers standing in front of the wall (see Figure 17; teamLab, 2017).

The first step in participating in the project is to design your own character, which is similar to *Flowers Bombing*. There are two figures that can be chosen, a male (wearing pants) and a female (wearing a skirt). Although the action seems to be the same as colouring a flower, the human image is much more complex than a flower and involves a lot of personal meaning, which may link to the Symbolic component. In fact, the self-

portrait is often used to evoke the symbolic function (Hinz, 2009). After scanning and uploading, participants are able to start programming to command the avatars. The complexity and structure of the MDV in this stage is extremely elaborate but in order. This is a stage requiring a significant amount of planning and logical thinking. Thus, the ECT process eventually redirects leftward to the Cognitive pole (see Figure 18).

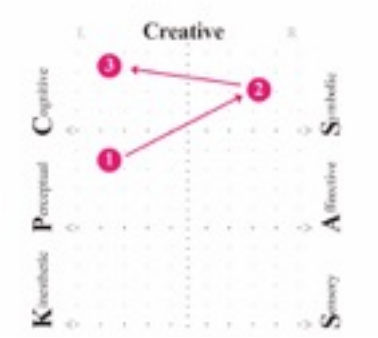

Fig. 18 Play! Programming for Geniuses (ETC)

Outside of drawing avatars, *Play! Programming for Geniuses* is full of dramatic factors. The avatar represents the character in the play and the process of programming is like writing a script. From the drama therapy perspective, people are able to re-identify themselves via role playing (Landy, 1994). The director of Drama Therapy program in New York University, Nisha Sajnani states, "Our understanding of who we are, and the extent to which we can stretch the boundaries of the roles that we play, arises from the intersubjective space between us, the gaze we impart and receive, and the images and stories that we see, hear and tell about ourselves" (Sajnani, 2020, p.4). Besides, because of the common essence between drama and play, it can be linked to play therapy (see Figure 19). However, the play feature in this project is slightly different from the last project. In the mid 20th century, Peter Slade divided the concept play into two categories— Personal Play and Projected Play. Personal Play is action related, which comprises body movements and in-person role-playing (Emunah, 1994; Landy, 1994; Slade, 1995). The aforementioned project, Interactive

Fig. 19 Play! Programming for Geniuses (Art Forms)

Projection Mapping at Saga Castle falls into this category. Projected Play, in contrast, is internally oriented. It requires lots of imagination, and all these inner-world activities are projected to the surrounding objects (Emunah, 1994; Landy, 1994; Slade, 1995). *Play! Programming for Geniuses* is attributed to this division.

Projected Play, compared with Personal Play, causes a distancing effect, which is especially suitable for those who don't know how to maintain affection or have difficulty to face their issues directly (Emunah, 1994). This technique has been widely used in drama therapy. Some practitioners called it a one-step removed tactic (Baim et al., 2002). In Play! Programming for Geniuses, the projected avatars, as the analogous of puppets and masks in conventional drama therapy, cause the effect of distancing and are able to guide patients to play the role from an objective perspective. Objective observation increases understanding, acceptance, re-evaluation and adjustment (Emunah, 1994). Participants use a tablet to command the avatar. The first step is to name the avatar. It is an important concept of coding— declaring an object. Interestingly, Naming has its special function in drama therapy; it causes the distancing effect (Emunah, 1994). One of the advantages of this project is that it allows one person to play several characters simultaneously. Participants are able not only to play various roles they create but multiple roles in the theatre context. They are either actors, directors, or audience members. This breaks through limits of conventional therapy and opens up new possibilities in the field.

2.4 Discussion

By juxtaposing the five graphs of expressive elements, we can see that teamLab's work encompasses a huge variety of art forms (see Figure 20). Participants are able to draw, swing, jump, act, play with sound, and make a story. Traditionally, each art form has its distinctive expressive process and has developed a comprehensive system from creation to presentation. Although all forms are under the same umbrella of "expressive arts" and there are certain overlaps, the technical gap between each form had caused obstacles for interdisciplinary blending. Today, digital media, as a platform, transfers each creative element into the same 0101 code which allows integration of the heterogeneous field of expressive therapy.

Fig. 20 Art Forms of Selected Cases

The creative process of the five cases touches all ETC components (see Figure 21). The digital creative process could be as simple as placing a digital stamp, or it could be as involved as coding a story. Although most of the projects begin with the left side of the ETC system— which refers to involving more analytical and logic functions, they usually are able to move rightward to functions related to emotional expression. This somehow refutes the concern raised in Section 1.3, which demonstrates the worry of digital tools overvaluing reason and devaluing emotion. Yet, the freedom of individual creativity within the five projects is somewhat confined. After all, teamLab is an artistic

company, thus the final output of their work maintains a sense of consistency within a certain artistic aesthetic.

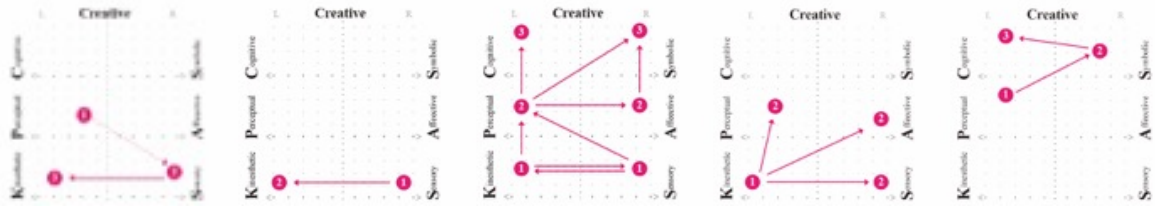

Fig. 21 ETC of Selected Cases

In addition, because the projects above are designed for the general public, the effect of these sorts of activities for people will mental conditions is unclear. All the graphs were depicted according to the author's current knowledge and there are certain elements which could not easily be categorised using the existing framework. These need to be further examined. The coming section will provide potential possibilities to overcome this flaw.

3. Future Directions

3.1 Creative Process Datalisation

In Section 1.1, a pioneer of digital expressive therapy, Diane Weinberg (1985), was mentioned. In those early times, she understood the potential of computational tools in "monitoring patients' cognitive responses". She expressed her belief that computational records contain an abundance of information about how patients "make decisions, problem-solve, and express themselves creatively", which is an advantage for research purposes (Malchiodi, 2018, Chapter 1, The Twentieth Century: Computer-Mediated Art Therapy, para. 4). Advanced technology has opened a new world for humans to understand themselves. Datalisation and body-related detecting technologies have the capacity to transform physical responses and behaviour (conscious or unconscious) into readable and analysable data. This has the potential to completely change the current ecology of both research and practice in expressive therapy.

There are several ways digital tools datalise the creating process. Some of these examples can be seen in selected teamLab cases. The movement detector in *Flowers Bombing* catches hand motion, and meanwhile is able to record changes in position and speed. Touchscreen in *Sketch Piston- Playing Music* not only remembers position and speed but the strength of strokes. VR devices offer even greater potential because of their proximity to the body. For instance, a pulse sensor can be added to the hand controller to observe the clients' heartbeat variation during creation. Or, it can be installed with other sensors, such as electromyography (EMG), to measure grip pressure and muscle tension, which are related to stress and anxiety levels. In addition to EMG, electroencephalogram (EEG) system, or brainwave sensors, could be combined with the

VR headset to document brain activity. So, how do these contribute to the field of expressive therapy?

In research, an influential phenomenon within art therapy research uncovered by Kaiser and colleagues is that educators are inclined to teach qualitative research in preference to quantitative (Kaiser et al., 2006). It is not surprising that art therapy researchers tend to prefer qualitative means because most knowledge of expressive therapy is “empirical, heuristic, and subjective” (Kim, 2018, para 1), which is difficult to be mathematically measured. However, the scientific value of qualitative research has been in doubt in the domain of health study (Johansson et al., 2003). And many therapists have noticed the necessity of quantitative approaches, which could possibly resolve “implicit ambiguity and uncertainty in art therapy” (Kim, 2018, Computer Technologies as a Solution, para 2). As noted in Section 1.3, some therapists show concern with the therapeutic efficacy of digital application in creative therapy. It is necessary for the field to have hard data for the sake of its academic sustainability and persuasiveness (Kaiser, 2006; Kim, 2018).

Similar to research, collecting data during creative therapy also helps support assessment and supervision, which enables therapists to better evaluate the situation—patients (assessment; Gfeller, 1995) and their own (supervision; Brandoff & Lombardi, 2016). Certainly, technological advance has already transformed the means of assessment and supervision to some extent. Instead of relying on text and memory, which are considered to be subjective and less reliable, digital photography and video provide handy and not expensive ways to record the actual scene of the therapy (Atkins,

2007; McNiff, 2018b; Ray, 2011). Perhaps, with those digitalising techniques, now, we can be more ambitious about our vision of future supervision and assessment.

In Chapter 2, the ETC framework was introduced to analyse the selected teamLab cases. While applying ETC to assessment, the strengths and weaknesses of information processing are uncovered and ETC points out the association between these deficiencies and superior abilities and the clients' difficult and joyful experience. In order to obtain enough information and avoid the influence of the environment or occasional situations, a series of creative activities are required (Hinz 2016). In recent years, artificial intelligence (AI) and big data have pushed data analysis to a new level. If we are able to datalise the creative processes, it is not impossible for computational algorithms to auto-generate assessment reports and graphs. Also, computers may play a role as an assistant to provide advice for possible therapeutic activities. Moreover, once the database is big enough, the flaw mentioned in Section 2.4, *Discussion* could be automatically fixed.

3.2 The Evolution From Physical to Affective Computing

Instead of supplying input for evaluation and analysis, electronic sensors could also convert data into immediate feedback during the therapeutic process. Certainly, the five case studies examined above have already employed the use of sensors, like hand movement detection in *Flowers Bombing*. Yet, most of them focus on motion detection, which is attributed to the concept of physical computing (mentioned in Section 1.2-*Creative tools*). In order to become a more effective comprehensive tool for mental health, instead of focusing on only external physical movement, these new digital

approaches should involve affect, which links up with the burgeoning concept of affective computing.

According to the Chair of Affective Computing Group at the MIT Media Lab, affective computing indicates “computing that relates to, arises from, or influences emotions (Picard, 1995, p 1). Along with the individual development of emotional-sensing technology and artificial emotional intelligence, combining these techniques into creative processes may enhance emotional expression and awareness.

The affective computational inputs could be used as a creative element or, could become a supplement of therapeutic responses. One of the pities of *Play! Programming for Geniuses* is that, although the body motion of the avatars is controllable, the facial expression is static. If combined with facial detecting system, the avatars would be able to reflect the clients’ immediate facial expression. Again, sensing technology may act as a therapist's assistant. By detecting bio-responses, computers are able to automatically analyse the results and convert them into certain responses based on therapeutic influences. For instance, the AI may recognise attention alleviation signals by the input of the eye-tracking system, and then automatically change the rhythm of music or the colour of the digital pigment to recall attention. In 2019, Leslie and colleagues, introduce a music system which detects participants respiratory rate to produce music and eventually invite a state of calmness (Leslie et al., 2019). Moreover, as people nowadays recognise the importance of brain study in mental health, brain-related sensors may be preferred for future therapeutic creation because, “the information in the nervous system is the same information that’s in an electrical device” (Eduardo Fernandez, personal communication, n.d., as cited in Juskalian, 2020).

3.3 The Need for Tactility

As mentioned in Chapter 1, one of the biggest concerns of digital expressive therapy is its disconnection with reality caused by a lack of tactility and a sense of scale. In fact, many scientists have acknowledged this issue and are trying to bring about tangible sensation into the digital world.

In the case of computer-manipulated tactility, there are already a number of released or on-going cases. Some researchers focus on studying using wearable devices to mimic haptic responses, which has been mentioned in Section 1.3. An interactive designer and researcher, Christine Würth, has done a serial experiment studying haptic body augmentation devices (Würth, n.d.), and in 2018, eventually published a proposed use of haptic communication directly to the neocortex (Würth, 2018).

Outside of these sophisticated examples, there are methods to achieve haptic perception by common tools. In fact, teamLab has given a hint for possible solutions in the project of *Sketch Animals Papercraft* (teamLab, 2016c), a side project of *Sketch Animals in ZOORASIA* (teamLab, 2016d). Similar to *Play! Programming for Geniuses*, participants colour their animals in 2D and the computer turns them into 3D animations. The interesting part of this project is that the animal is not only shown by projection, but it could also be printed as a paper craft (see Figure 22). By doing this, the virtualised 3D animals become tangible. Excepting paper craft, 3D printing could transform virtual items into real-world objects. Furthermore, fabricating technology, such as CNC and robotic arm, could be an option. In 2016, Syuko Kato Westby launched a project to fabricate choreography movement by bending metal tubes with robotic arms and eventually creating a large scale sculpture (see Figure 23; Kato Westby, 2016; Kato

Westby & Glynn, 2017). Because the metal tubes are constructed during the performance, an interesting interaction between the fabricated motor path and present movement is formed.

Fig. 22 teamLab 2016. *Sketch Animals Papercraft*

Fig. 23 Syuko Kato Westby 2016. *Fabricating Performance*

3.4 Mobility and Virtualisation

Expressive therapy in the virtual medium could solve the inconvenience of real-world limitations. The recent COVID-19 pandemic has forced people to operate while isolated, and so does the expressive therapy (Sajnani, 2020). In addition to accessing clients with mobility difficulties, at-home treatment has unique advantages that are not offered in conventional therapeutic spaces. It allows both clients and therapists to work in their most familiar environment, which provides a sense of safety. It also offers the opportunity for patients to face their issues in their specific living environment. Play therapy, as an example, is a useful tool for children with issues to learn how to better communicate and express themselves. However, there is often a split between the achievement in the therapy room and the application in daily life (Watanabe et al., 2015).

Although all of the selected cases are on-site exhibition, they can possible be operated remotely. Surprisingly, just as this paper is written, teamLab released the at-home version of *Flowers Bombing*, where anyone can create their own version of the digital flower at home by downloading the drawing paper and uploading it to the online canvas. Then people all over the world can see the flowers tinting via youTube live video (teamLab, n.d.e). This is a world-scale co-creation.

Digitalisation could also resolve the inconvenience brought by tangible materials and props. Unlike talking psychotherapy, most expressive therapy requires supplemental tools and materials in treatment. In the case of art therapy, ideally, the more diverse material patients can choose, the more they can feel the freedom of expression. However, it is cumbersome to bring multiple materials from site to site. Additionally, virtualising expressive therapy has some economic benefits. On one hand, it helps to save the expenditure on renewing material. On the other hand, it can eliminate the cost of setting up therapy rooms. Traditionally, each therapy room has its unique design in the sake of the form of treatment, and not every agency can afford setting up comprehensive rooms for each type of therapy. This has become an obstacle for promoting expressive therapy. By virtualising the setting, expressive therapy can be operated in almost any spatial condition. From this point of view, the previously mentioned argument over the cost of digital equipment can be refuted.

Conclusion

No one can deny that new technology is ubiquitous in the modern era. It has not only affected information transfer but also caused a profound impact on creative expression. Expressive therapy, as a treatment laying on creative communication, can not avoid evolving alongside. Moreover, the newest generation has largely been influenced by digital media, and there will be always the next generation familiar with novel inventions. It is crucial for therapists to constantly reposition their approach to "speaking-the-client's-language" (Stone, 2020, p. 2). There are several advantages of applying digital media to expressive therapy. Online network simplifies the communication between professionals and helps service users build a feeling of social connection; digital software makes artistic expression more approachable for everyone (McNiff, 2018a). However, for every social progression, there is always corresponding skepticism, and it is essential to reflect on the related impact. Throughout history, civilization has advanced via push-and-pull.

By dissecting teamLab's works with the ETC model, a preliminary image of how digital media could be applied to the current expressive therapy system has been shown. Yet, in terms of the expressiveness of digital media which are beyond physical constraints, further evaluation is required. In the case of clarifying the art form within teamLab's works, the five case studies demonstrate the diversity of digital expressiveness and therefore should not be thought of as a single form of material.

Although the potential is strong, challenges persist. It is essential for therapists to understand the material they use because "each material has a stimulus potential, or capacity to activate a unique response in the user" (Hinz, 2016, p.136), and sometimes

inappropriate material could lead to harm (physical or mental). More empirical studies are required to establish lasting guidelines. Another challenge of promoting digital expressive therapy is in the developing phase. Each sort of expressive therapy is interdisciplinary. It requires practitioners to have at least one form of expressive arts experience and mental health expertise. New media art is also interdisciplinary. Extensive cross-field collaboration needs to be done.

Conceivably, in the coming future, a digital expressive therapy system will be established. It will enable researchers to collect and analyse data in practice. It can also play a role as assistance for therapists during the treatment. As technology advances, new devices will be able to provide more accurate haptic feedback. And digitalisation makes the service more accessible than before.

Lastly, the field must bear in mind the world of the Chair of Interactive Telecommunications Program (ITP) at New York University, Red Burns, who said, “Technology is not enough. Consider the technology as a tool which, in itself, could do nothing. Treat the technology as something that everyone on the team could learn, understand, and explore freely” (Burns, n.d., as cited in Shiffman, n.d., para 1).

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