## Therapeutic Computational Creativity: Co-Creativity for Well-being

Paul Bodily Computer Science Department

Idaho State University Pocatello, ID 83209 USA bodipaul@isu.edu

## Abstract

An open question in co-creativity research is "What positive behaviors and outcomes are observed in humans as they engage in human-computer cocreativity?". The effective design of co-creative systems to achieve these behaviors and outcomes represents an area of great untapped potential for the HCCC field that merits further consideration. We define Therapeutic Computational Creativity (TCC) as the study, design, engineering, and application of Computational Creative systems that fundamentally engage humans in a co-creative enterprise for the purpose of improving the mental or physical health of human participants.

## Introduction

The field of Computational Creativity (CC) has accomplished great feats across numerous domains of creativity; and yet numerous challenges persist to the relevance and value of this research. Whereas people have broadly welcomed AI, there seems to be greater resistance to allowing computers to encroach on what many view as a fundamentally human endeavor (Bodily and Ventura 2020). Does CC have a legitimate contribution to make to human society or is the field destined to remain a sidelined curiosity?

In 2019, Cheatley et al. published "Opportunities for Computational Creativity in a Therapeutic Context" in which they suggest that one hitherto community of untargeted creativity stakeholder includes "those for whom the creative process and outcome can have therapeutic value". Independent from this work, our own research trajectory has tended towards a similar conclusion. We define Therapeutic Computational Creativity (TCC) as the study, design, engineering, and application of Computational Creative systems that fundamentally engage humans in a co-creative enterprise for the purpose of improving the mental or physical health of human participants. We propose that this emergent subfield represents a significant opportunity for the growth and relevance of CC as a whole and merits a serious discussion within the CC community, particularly within the HCCC community.

Creativity in general can be used therapeutically in at least two primary methods: *appreciating* the creativity exhibited by others and *engaging* personally in the creative process. Although both methods bring about therapeutic benefits to humans, it is particularly the *engaging* of humans in the creative process that has been found to produce the most positive results. Engaging people in creativity has been an effective treatment with autism (Torrance 2018), childhood cancer (Pulham et al. 2019), mental health (Benjamin 2018), well-being in higher education (Hughes and Wilson 2017), dementia (Hannemann 2006), refugees (Alayarian 2007), couples therapy (Shub 1999), and bipolarity (Fodor and Laird 2004), to name a few.

TCC has begun to be discussed in varying communities and to varying extents in recent years. Cheatley et al. (2019) collected data to present preliminary research on design recommendations for a CC bereavement support tool to aid those struggling with the loss of a loved one. Their findings suggested that among those struggling with this issue, the majority reported a positive interest in a CC support tool. Much other work has examined how human-computer cocreativity can be used to foster greater human creativity, for example in classroom activities (Schmoelz 2017) and in promoting lateral thinking and creative emotive reasoning (Liapis et al. 2016). Unique benefits derive from collaborative creativity (Mamykina, Candy, and Edmonds 2002).

As a concrete example of TCC, we invite consideration of a TCC musical metacreative system autonomously capable of composing short lyrical songs in response to particular themes or moods. We envision developing this system as a mobile application capable of creating and/or co-creating music with the goal of responding to and improving the mental well-being of the user (see Figure 1). The success of such a system hinges both on the inherent creative capabilities of the system *and* engaging the human co-creator in order to provide a therapeutic benefit.

We hypothesize that the field of CC may yet find its greatest relevance in *Therapeutic* Computational Creativity. There is ever-increasing demand for solutions to global challenges of physical and mental health, many of which are ironically being driven by computational systems themselves in the form of addictive and isolating technologies. Significant funding resources exist for this type of research. Our community is well-positioned to make an impact in this arena. We suggest that community discussion devoted to this theme is necessary to fostering networking, collaboration, and innovation that will position our community to take a leading role in this emerging subfield.



Figure 1: A hypothetical TCC system for creating or cocreating music with the goal of responding to and improving the mental well-being of the user.

## References

Alayarian, A. 2007. Trauma, resilience and creativity: Examining our therapeutic approach in working with refugees. *European Journal of Psychotherapy and Counselling* 9(3):313–324.

Benjamin, E. 2018. The creative artists support group: a therapeutic environment to promote creativity and mental health through person-centered facilitation. *Person-Centered & Experiential Psychotherapies* 17(2):111–131.

Bodily, P., and Ventura, D. 2020. What happens when a computer joins the group? *Proceedings of the Eleventh International Conference on Computational Creativity*.

Cheatley, L.; Moncur, W.; and Pease, A. 2019. Opportunities for computational creativity in a therapeutic context. In *Proceedings of the Tenth International Conference on Computational Creativity*, 341–345. Association for Computational Creativity.

Fodor, E. M., and Laird, B. A. 2004. Therapeutic interven-

tion, bipolar inclination, and literary creativity. *Creativity Research Journal* 16(2-3):149–161.

Hannemann, B. T. 2006. Creativity with dementia patients. *Gerontology* 52(1):59–65.

Hughes, G., and Wilson, C. 2017. From Transcendence to General Maintenance: Creativity and Wellbeing in Higher Education.

Liapis, A.; Yannakakis, G. N.; Alexopoulos, C.; and Lopes, P. 2016. Can computers foster human users' creativity? theory and praxis of mixed-initiative co-creativity. *Digital Culture & Education*.

Mamykina, L.; Candy, L.; and Edmonds, E. 2002. Collaborative creativity. *Communications of the ACM* 45(10):96–99.

Pulham, R. A.; Alia, D.; Marshall, L.; and Lambert, D. 2019. Using therapeutic documents: A story of creativity tricks and living after childhood cancer. In *Clinical Psychology Forum*, volume 320, 22–27.

Schmoelz, A. 2017. On co-creativity in playful classroom activities. *Creativity. Theories–Research-Applications* 4(1):25–64.

Shub, N. 1999. Stretching–developing therapeutic creativity in work with couples. *Journal of Couples Therapy* 8(1):35–51.

Torrance, J. 2018. *Therapeutic Adventures with Autistic Children: Connecting Through Movement, Play and Creativity.* Jessica Kingsley Publishers.