
Leveraging Background Game Audio for Wellbeing

Katja Rogers

Institute of Media Informatics
Ulm University
Ulm, Germany
katja.rogers@uni-ulm.de

Abstract

Mental health issues have severe consequences for individuals and society as a whole. One major risk factor for these issues consists of exposure to high-stress environments; as such, many preventative measures have been explored to avoid and ease effects of stress. Games have been explored as a preventative measure in recent years, while music listening has been used in this context for centuries. This position paper serves as an outline of background audio in games acting as a potential mediator in positive effects on wellbeing. Through our support of this research direction, we hope that this factor can be explored and potentially leveraged for games to provide more effective stress management and facilitate players' wellbeing.

CCS Concepts

•**Human-centered computing** → **Auditory feedback**;
•**Applied computing** → **Computer games**; •**Software and its engineering** → **Interactive games**;

Author Keywords

Game audio; background music; mental health; wellbeing.

Introduction

Although historically dismissed and stigmatized in comparison to physical health concerns, in recent years, awareness seems to have grown of mental health as a social

issue [15]. Partly this can be ascribed to efforts by institutions such as the World Health Organization, and partly to an upswing in research on effects of mental health issues. The adverse effects include burnout and depression, itself with severe consequences for both individuals and society. However mental health issues are also linked to physical illnesses (e.g., cancer and cardiovascular disease), which further increase the economic cost of mental health issues [11]. Current research and involved organizations are increasingly advocating preventative measures against stress, as exposure to stressful environments is one of the main risk factors of mental health issues [10, 17, 11].

Video games have been discussed in the context of mental health for many years, and has often been mentioned in a negative light. However, more recent literature has increasingly found positive effects of gaming on wellbeing, through its function as stress relief and fulfilling human needs outlined by self-determination theory. However, as proposed in a recent workshop paper [13], there may be a further mediator through which games can support wellbeing: their background music. Music listening outside of games has numerous positive effects on mental health, and has an extensive history of use in clinical settings.

This position paper discusses the potential link between game audio and mental health. We first summarize current research on the interrelationship of gaming and mental health, and show that it has thus far mostly explored games as a whole. We then focus on the role of music listening in mental health, and discuss how game audio—background music, in particular, and players' myriad replacements thereof—may have similar effects.

Games and Mental Health

Games have a mixed reputation in the media, and can have negative effects on mental health. However, this is generally linked to problematic use and immersion motivations [6]. Games also have the capacity to improve wellbeing [19]. They have also been used to improve outcomes in clinical settings, ranging in application from psychological and physical therapy, to pain distraction [12, 20]. Game interventions also improve standard care for depression [8].

There are several theories on the origin of these positive effects on wellbeing. One consists of games' aptness in fulfilling individuals' needs as outlined by self-determination theory: autonomy, competence, and relatedness [2, 19]. Another theory sees games helping players to manage negative emotions through relaxation and cognitive distraction [8]. Both seem consistent with one of the main definitions of wellbeing as a state occurring at the balance between individuals' challenges, and the availability of resources to deal with them [3]. However, all of these previous works have focused on effects of gameplay as a whole, or particular games and/or genres. In this paper, I support the need for research into individual components of games, foremost among them, audio.

Music Listening and Mental Health

Outside the context of games, music listening has been connected to positive effects on health and wellbeing for many centuries, and across cultures [1]. Music listening facilitates emotion regulation and stress reduction in everyday life, and many people indeed use it for the express purposes of relaxation and mood regulation [7, 16, 18]. In terms of therapeutic application, music therapy improves wellbeing after stressful experiences [4], and like games, music improves standard care for depression [9]. It is also used in clinical settings for relaxation and pain relief [1].

Impact of Background Music in Games

Given the prevalence of background music in games, it would be interesting to explore how much of the positive impact of video games on mental health can be attributed to their background music. Further, how can the background music be designed to leverage these positive effects for stress relief most effectively? Merely adding relaxing music likely will not suffice, considering that people play very diverse games for stress relief, and thematic and stylistic fit should be considered. For example, players would probably dislike very slow, relaxing music in a fast-paced, gritty first-person shooter.

In a recent survey on players' audio habits, participants revealed a wide variety of stances toward background music in games¹. Game soundtracks are loved by many to the extent that they listen to them outside of game playing as well. Other players ignore background music and turn it off, or replace it—again, with a wide variety of other audio sources. Given that people already self-regulate emotions and reduce stress through music listening, and playing games, perhaps they also already choose the kind of background audio that best facilitates relaxation for them. On the other hand, facilitating stress reduction may consist of encouraging or offering specific types of background audio in games. Further, there is evidence to suggest that effects of background music on player experience can be overshadowed by sensory or physiological distractions; future researchers and developers may have to consider this in the design of background music, particularly in virtual/mixed reality games or exergames [5, 14].

Mental health is an issue of increasing societal and financial importance, and prevention strategies include helping individuals to reduce and manage stress in everyday life.

¹Analysis ongoing.

In this paper, we elaborate on research areas exploring the effects on wellbeing of music listening and playing games, respectively. We further discuss games which are considered relaxing and point out research directions for exploring the role of game audio in improving player wellbeing, and through stress reduction, also helping to prevent mental health issues. With this paper, we hope to spark a discussion and on the role of audio in game design for wellbeing, as well as prompt potential collaborations to further this research direction.

Conclusion

Background music may be a mediator of the positive effects of gaming on mental health. We suggest that exploring this research question may enable us to increase these effects by designing or encouraging game audio for stress relief, to facilitate the prevention of mental health issues. We aim to spark discussion on this aspect of research at the intersection of games and mental health, and through participation in this forum, we hope to invite collaboration and feedback for planned future work.

REFERENCES

1. Francis C Biley. 2000. The effects on patient well-being of music listening as a nursing intervention: a review of the literature. *Journal of Clinical Nursing* 9, 5 (2000), 668–677.
2. Edward L Deci and Richard M Ryan. 2011. Self-determination theory. *Handbook of Theories of Social Psychology* 1 (2011), 416–433.
3. Rachel Dodge, Annette P Daly, Jan Huyton, and Lalage D Sanders. 2012. The challenge of defining wellbeing. *International Journal of Wellbeing* 2, 3 (2012).

4. Eri Hirokawa and Hideki Ohira. 2003. The effects of music listening after a stressful task on immune functions, neuroendocrine responses, and emotional states in college students. *Journal of Music Therapy* 40, 3 (2003), 189–211.
5. Costas I Karageorghis and David-Lee Priest. 2012. Music in the exercise domain: a review and synthesis (Part I). *International Review of Sport and Exercise Psychology* 5, 1 (2012), 44–66.
6. Amy Kirby, Chris Jones, and Alex Copello. 2014. The impact of massively multiplayer online role playing games (MMORPGs) on psychological wellbeing and the role of play motivations and problematic use. *International Journal of Mental Health and Addiction* 12, 1 (2014), 36–51.
7. Petri Laukka. 2007. Uses of music and psychological well-being among the elderly. *Journal of Happiness Studies* 8, 2 (2007), 215–241.
8. Jinhui Li, Yin-Leng Theng, and Schubert Foo. 2014. Game-based digital interventions for depression therapy: a systematic review and meta-analysis. *Cyberpsychology, Behavior, and Social Networking* 17, 8 (2014), 519–527.
9. Anna Maratos, Christian Gold, Xu Wang, and Mike Crawford. 2008. Music therapy for depression. *The Cochrane Library* (2008).
10. Christina Maslach and Julie Goldberg. 1998. Prevention of burnout: New perspectives. *Applied and preventive psychology* 7, 1 (1998), 63–74.
11. World Health Organization. 2013. Mental health action plan 2013 – 2020. (2013). http://www.who.int/mental_health/publications/action_plan/en/.
12. Brian A Primack, Mary V Carroll, Megan McNamara, Mary Lou Klem, Brandy King, Michael Rich, Chun W Chan, and Smita Nayak. 2012. Role of video games in improving health-related outcomes: a systematic review. *American journal of preventive medicine* 42, 6 (2012), 630–638.
13. Katja Rogers and Lennart Nacke. 2017. Exploring the Potential of Game Audio for Wellbeing. In *Positive Gaming: Workshop on Gamification and Games for Wellbeing*.
14. Katja Rogers, Giovanni Ribeiro, Rina R Wehbe, Michael Weber, and Lennart E Nacke. 2018. Vanishing Importance: Studying Immersive Effects of Game Audio Perception on Player Experiences in Virtual Reality. In *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. ACM, 328.
15. Nicolas Rüsçh, Matthias C Angermeyer, and Patrick W Corrigan. 2005. Mental illness stigma: concepts, consequences, and initiatives to reduce stigma. *European psychiatry* 20, 8 (2005), 529–539.
16. Suvi Saarikallio and Jaakko Erkkilä. 2007. The role of music in adolescents' mood regulation. *Psychology of music* 35, 1 (2007), 88–109.
17. Sabine Sonnentag and Charlotte Fritz. 2007. The Recovery Experience Questionnaire: development and validation of a measure for assessing recuperation and unwinding from work. *Journal of Occupational Health Psychology* 12, 3 (2007), 204.
18. Daniel Västfjäll, Patrik N Juslin, and Terry Hartig. 2012. Music, subjective wellbeing, and health: The role of everyday emotions. *Music, Health, and Wellbeing* (2012), 405–423.

19. Kellie Vella, Daniel Johnson, and Leanne Hides. 2013. Positively playful: when videogames lead to player wellbeing. In *Proceedings of the First International Conference on Gameful Design, Research, and Applications*. ACM, 99–102.
20. Nathan Wilkinson, Rebecca P Ang, and Dion H Goh. 2008. Online video game therapy for mental health concerns: a review. *International journal of social psychiatry* 54, 4 (2008), 370–382.