

Table 1: Evidence based table of publications not included in the referenced reviews

Author	Study Question	Population	Study Method	Findings
Akerman et al 2023	To investigate the mechanism underlying ear worms in order find more effective ways of suppressing them	35 normal volunteers	Participants asked to listen to a catchy tune and then complete the stop-signal task. They were then assigned to inhibition or no-inhibition conditions and then monitored on line for earworm emergence after 3, 6 and 24 hours	Participants assigned to the inhibitory condition reported earworms significantly less than those in the no-inhibition condition
Akerman-Nathan et al 2024	To study involuntary musical imagery as a model for intrusiveness without negative content	1200 participants	Fill in questionnaires to assess aspects of intrusiveness and affective states including depression, anxiety, stress and rumination	Intrusiveness shared variance with the negative experience of involuntary musical imagery but not with frequency while increased ruminative thinking was found to increase both the frequency and negative perception of earworms
Beaty et al 2013	To further study the phenomenology of involuntary and voluntary musical imagery	190 undergraduates, mean age 19	Retrospective study to assess the importance of music to a particular individual and then an experience sampling design to assess the phenomenology of musical imagery over a one week period using a cell phone based interactive response	Most participants found earworms pleasurable and meaningful. Those in whom music played an important part in their lives tended to have an increased frequency but reported fewer episodes of deliberately induced images
Corti et al 2020	Case report of a 30 year old patient with stuck song syndrome and obsessional compulsive disorder	N equals 1	Narrative case report	In contrast to earworms the continuous involuntary musical imagery was distressing and had been present since 18. Patient used avoidance techniques such as staying at home all day, meditation and ear phones to reduce the discomfort
Cotter 2020	A viewpoint on the mental control mechanisms involved with musical imagery	No patients	Review of knowledge on lab-based auditory imagery, involuntary musical imagery, mental rehearsal and composition, and ecological musical imagery	Mental control of musical imagery can be considered best in two separate components initiation (factors involved in its appearance) and management (factors which can influence it once it has occurred)
Cotter et al 2019	Experience sampling survey to investigate the diversity of musical imagery	132 musicians and members of university community	Use of smart phone app to obtain data on experiences of musical imagery in relation to 5 dimensions: valence, repetitiveness, vividness, length, and mental control	The findings revealed marked heterogeneity in musical imagery and indicate that mental control over musical imagery is both common and multifaceted
Floridou et al 2023	An investigation of the internal and external experience of involuntary music imagery repetition	6 musical composers	Semi-structured interviews	Music that comes to the mind spontaneously and repetitively occurs more commonly in certain specific mental and physical states and. is usually experienced positively and often with a sense of familiarity
Jalbert et al 2023	To determine whether all intrusive thoughts are related to traumatic experiences	153 undergraduate students median age 20 years	Participants listened to catchy popular song clips expected to trigger earworms and in a second experiment cued to recall their autobiographical memories	Songs and autobiographical memories replaying mentally felt more intrusive when they were incongruent with the current task, cued repeatedly, and had negative emotional content. intrusiveness was context-

				dependent and influenced by many features
Killingly et al 2023	To investigate whether the engagement of working memory by earworms is moderated by prior exposure to music and familiarity	4 participants recruited from community via social media adverts	Exposure to four novel song choruses between one and four times to manipulate exposure followed 24 hours later by serial recall testing during and following presentation of each song. Ratings related to familiarity, enjoyments and catchiness also done	Increased exposure to novel songs on the first day tended to result in greater interference on task performance during and following their presentation on the second day, yet the effect varied depending on the song
Kubit and Janata 2023	To investigate whether earworms and music evoked remembering aid in the consolidation of events with which music becomes associated	25 university undergraduates	Exposure to novel musical loops during tasks that varied in attentional and sensorimotor demand then one week later using the loops as soundtracks for unfamiliar movies, details of which had to be later recalled	Replay of musical sequence memories during episodes of INMI serves as a consolidation mechanism both for the music and for associated episodic information
Negishi K and Sekiguchi T 2020	Investigation of individual traits that influence the frequency of involuntary musical imagery and the emotional valence of these occurrences	101 university students	Use of the experience sampling method that measures earworms in daily life at the moment they occur. The effects of non-clinical obsessive-compulsive (OC) tendencies, personality traits, and musical expertise were also analysed	Obsessional traits and intrusive thoughts and musical expertise were related to involuntary musical imagery. Compulsive washing was linked to negative appreciation of earworms
Reuman et al 2020	To characterise the experience of earworms and associations including obsessive beliefs	240 undergraduate psychology students	Online survey of musical obsessions	Experiential avoidance is a predictor of earworm related distress
Scullin et al 2020	To investigate whether listening to music affects sleep by inducing earworms	50 participants mean age 21	Each participant asked to randomly listen to lyrical or instrumental-only versions of popular songs before bed in a laboratory with EEG recordings	Instrumental music can disrupt night-time sleep by inducing long-lasting earworms that are perpetuated by spontaneous memory-reactivation processes
Schubert et al 2023	An evaluation of a subclass of involuntary musical imagery referred to as Involuntary, Limited, and Contiguously Repeating Musical Imagery	No participants	Examination of extant data and contemporary theory of cognition and memory	Involuntary limited and contiguously repeating musical imagery is common. Recommendation of further empirical study
Taylor et al 2022	An evaluation of whether formation of earworms is influenced by musical tempo, level of musical training and engagement and the presence of lyrics	80 participants in study 2, students and visitors	Experiments to test the effects of tempo (fast or slow) and the presence of lyrics (instrumental or vocal) earworm retrieval and duration	Earworms are an idiosyncratic habit primed by the music listening and musical engagement of the individual
Wahl et al 2022	To examine the possible factors leading to musical obsessions and test Taylor's 2 factor model	291 student participants without obsessive compulsive disorder and 81 with a lifetime diagnosis of obsessive compulsive disorder	Online questionnaires	The less involuntary musical imagery occurred, the stronger was the positive relationship between dysfunctional interpretations and severity

References:

Akerman, A, Naftalovich H, Kalanthroff E

Inhibiting the emergence of involuntary musical imagery: Implications for improving our understanding of intrusive thoughts. *Cognitive Therapy and Research*. Vol.44,(4), 2020, pp. 885-891.

Akerman-Nathan A, Naftalovich H, Kalanthroff E. The aversiveness of intrusiveness: Evidence from involuntary musical imagery. *J Clin Psychol*. 2024 Jan;80(1):110-126.

Beaty RE, Burgin CJ, Nusbaum EC, Kwapil TR, Hodges DA, Silvia PJ. Music to the inner ears: exploring individual differences in musical imagery. *Conscious Cogn*. 2013 Dec;22(4):1163-73.

Corti G, Bellotti J, Granatto S, Toniolo G. Rare case of earworms: etiology and treatment. *European Psychiatry*. 2020;63:S175 Rare case of earworms: etiology and treatment. *European Psychiatry*, [s. l.], v. 63, p. S175, 2020

Cotter KN. Mental Control in Musical Imagery: A Dual Component Model. *Front Psychol*. 2019 Aug 21;10:1904.

Cotter, K.N.; Christensen, A.P; Silvia, P. J . Understanding inner music: A dimensional approach to musical imagery. *Psychology of Aesthetics, Creativity, and the Arts*. Vol.13,(4), 2019, pp. 489-503.

Floridou, G. A., Mencke, I., Caprini, F., & Müllensiefen, D. (2023). The Genesis of a Tune in the Mind: An Interview Study About Novel Involuntary Musical Imagery Repetition. *Music & Science*, 6.

Jalbert MC (Hyman IE Jr, Blythe JS, Staugaard SR. Investigating features that contribute to evaluations of intrusiveness for thoughts and memories. *Conscious Cogn*. 2023 Apr;110:103507.

Killingly C, Lacherez P. The song that never ends: The effect of repeated exposure on the development of an earworm. *Q J Exp Psychol (Hove)*. 2023 Nov;76(11):2535-2545.

Kubit BM, Janata P. Spontaneous mental replay of music improves memory for musical sequence knowledge. *J Exp Psychol Learn Mem Cogn*. 2023 Jul;49(7):1068-1090.

Negishi K, Sekiguchi T. Individual traits that influence the frequency and emotional characteristics of involuntary musical imagery: An experience sampling study. *PLoS One*. 2020 Jun 4;15(6):e0234111. doi: 10.1371/journal.pone.0234111.

Reuman L, Buchholz J, Abramowitz J. Stuck in my head: Musical obsessions and experiential avoidance. *Bull Menninger Clin*. 2020 Oct;84(Supplement A):48-62.

Schubert, E. Involuntary, Limited, and Contiguously Repeating Musical Imagery (InLaCREMI): Reconciling Theory and Data on the Musical Material Acquired by Earworms. *Music & Science*, Volume 6.

Taylor, A.L., Omigie, D. and Floridou, G.A. The Idiosyncrasy of Involuntary Musical Imagery Repetition (IMIR) Experiences: The Role of Tempo and Lyrics. *Music Perception* (2022) 39 (3): 320–338.

Wahl, K., Meyer, A.H., Heinzl, C.V. et al. Testing the Two-Factor Model of Musical Obsessions: Can They Be Predicted by the Interaction Between Frequency and Dysfunctional Interpretations of Common Earworms?. *J Cogn Ther* 15, 304–320 (2022).