

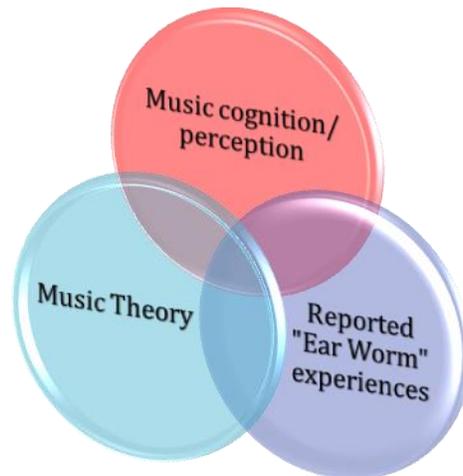


MUSICAL COGNITION, EMOTION AND IMAGERY: EAR WORMS

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ABSTRACT

Ever have a song stuck in your head that won't go away? That's an "ear worm," also known as **Involuntary Musical Imagery (INMI)**. Over ninety percent of people experience ear worms weekly; many experience them several times daily. Why do ear worms happen? Why does the perception of music persist long after hearing it? Why is INMI an ideal subject for scholarly examination and



documentation? Ear worms offer a valuable window to a richer understanding of the human relationship to music, allowing us to examine how sensory input, emotion and brain processes create (and re-create) a perceptual experience. **While scholars have studied "INMI onset" for several years (Williamson et al, 2011), this 2014-15 study considers the question of why ear worms persist as a perceptual experience.** This interdisciplinary project examines INMI from the perspectives of music theory, perceptual/cognitive science and the "reported ear worm experience", plus the creation of a compelling PBS-style documentary film.

Interdisciplinary Model, 2014-15 INMI Research

Background: Ear worms allow us to examine how sensory input, emotion and brain processes create (and re-create) a perceptual experience. They are a particularly salient outcome of the interaction of input structure and processing, involving not just the recall of information, but persistent (often involuntary) *re-experiencing of musical perception* without recurring external sensory input. These perceptual recurrences may be related to recent research in auditory neuroscience, suggesting the importance of neural oscillations and “neural loops” between the brainstem and cortex in the perception of complex sounds such as music and speech. In the present study, several questions guide our efforts: Does the frequency or severity of INMI in specific individuals likewise correlate with musical/emotional sensitivity or perceptual abilities? Are “ear worms” simply an annoying, obsessive occurrence, or instead a “working out” of emotional or cognitive issues on an entirely different level? What are the reported commonalities of this experience among a diverse group of subjects?

Interdisciplinary Methodology: Our study’s interdisciplinary approach grows from the inherently interdisciplinary nature of the question. One must accurately describe the structure of different musical passages, measuring the variety of personal experiences with music and differences in hearing/cognitive processing, and documenting the results in a way that can be broadly accessed by both scholars and lay persons.

Our study includes the following:

- On-line surveys to gather demographic and experiential data from subjects experiencing INMI
- Laboratory assessments of subjects’ music perceptual abilities
- An examination of musical elements – melody, harmony, form, rhythm – which may be particularly “ear worm-worthy”
- Structured interviews examining the subjective experience of INMI
- A documentary film (presented with this paper) to support community outreach on a subject of wide interest to scholars and music lovers in general

Outcomes: The project’s unique vision is to examine the ways in which these divergent perspectives intersect with one another, and to develop unique insights regarding the experience of INMI that may be of value to cognitive/perceptual scientists, and to music theorists, educators and therapists. [The author can be reached at krused@email.arizona.edu]