

RECALLED MUSIC: EARWORMS, APPLICATIONS, AND IMPLICATIONS

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BACKGROUND

- Earworms are types of recalled music, or the pieces of music that get stuck in your head
- They occur without trying and are generally repeated
- Earworms have been reported to be anything from a single line of a song to an entire symphony
- They are different than general recalled music as they are brought to mind without meaning to and they cannot be stopped on one's own accord
- The pool of existing research on earworms is very small and is focused on classifying musical imagery in general
- The research behind this study was focused on earworms and musical imagery as well as music, psychology, and education and advertising.

PURPOSE AND PROJECT GOALS

- Some research has been done on how to classify and categorize earworms among other types of recalled music, and some researchers have collected earworms, but there is little to no research published on the specific characteristics of an earworm with the goal of being able to fabricate one
- With knowledge of this sort, anyone would be able to produce a piece of music that would be easily memorized
- This would be a powerful tool because it would provide people with the ability to have information stuck in their heads without putting in the effort of actually memorizing it
- This is the overarching goal of researching what makes up an earworm. Thus, the purpose of this study is to identify specific characteristics that make an earworm different than a regular piece of music.

METHODS

Online Survey

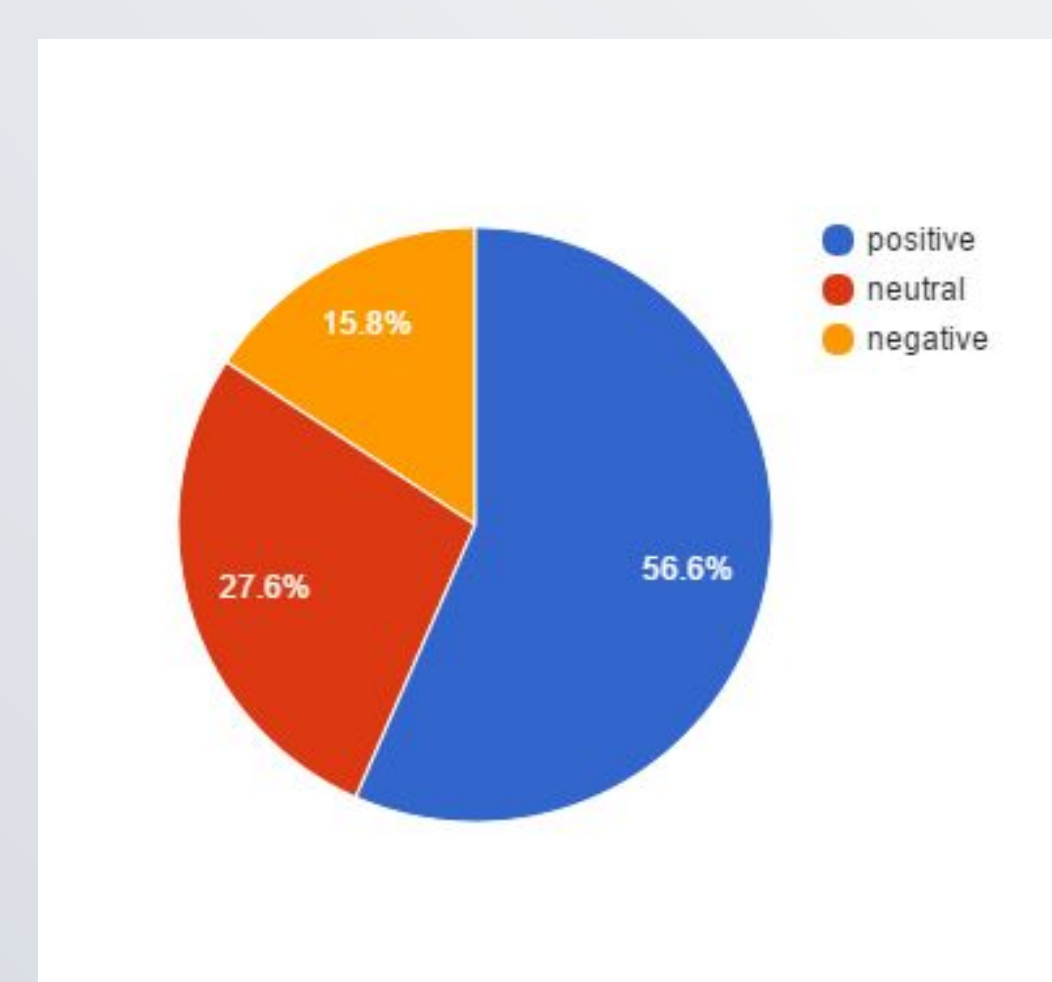
The data for this study was gathered using two methods, each providing different characteristics of earworms to test for commonalities. The first was an online survey sent out through social media, email, and text messages. It received 140 responses. The surveys were sent out to no particular sample population, as the purpose of the study was to find commonalities among all earworms. This means that there would be no difference in the conclusions whether multiple genres of music were tested, or if just one was tested. Some examples of the questions on the survey are as follows:

- Songs get stuck in my head after I listen to them: always, frequently, sometimes, rarely, never (select one)
- I notice songs getting stuck in my head when I feel: stressed, calm, happy, sad, angry, tired, energized, I do not notice a connection to my mood.
- The songs that get stuck in my head have a specific memory or emotional connection attached to them: strongly agree, agree, neutral, disagree, strongly disagree
- Are there any songs you notice getting stuck in your head frequently?

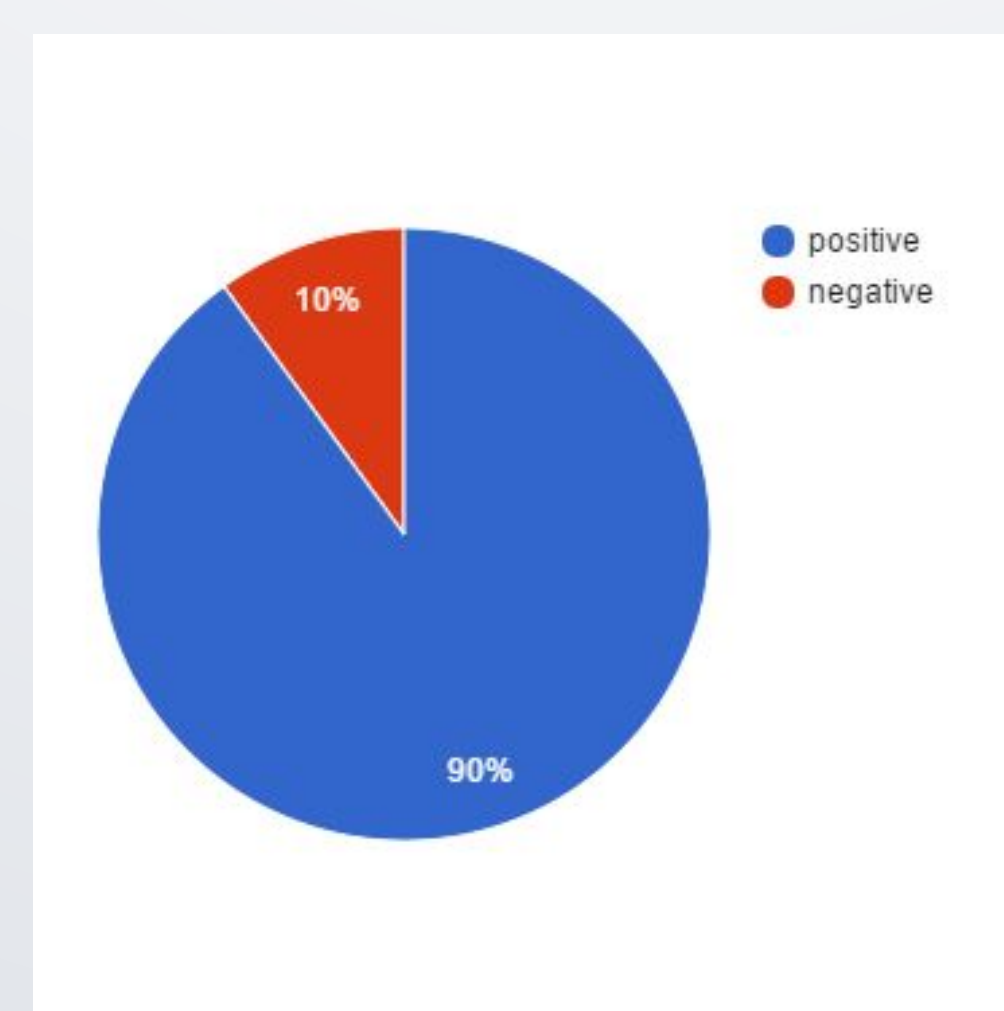
Earworm Diary

The other part of this study was a two week earworm diary. Thirty volunteers wrote down some details about their music experience and training and how much time they spend listening to music daily, and each time a song got stuck in their head for two weeks, they wrote it down along with some other notes. Participants were selected on a volunteer basis to ensure participation. If the participants had been selected and asked to participate, they may not have any interest in providing detailed responses. Once again, no particular sample population was used as the earworms should be universal no matter who they came from. Examples of questions from the earworm diaries are as follows:

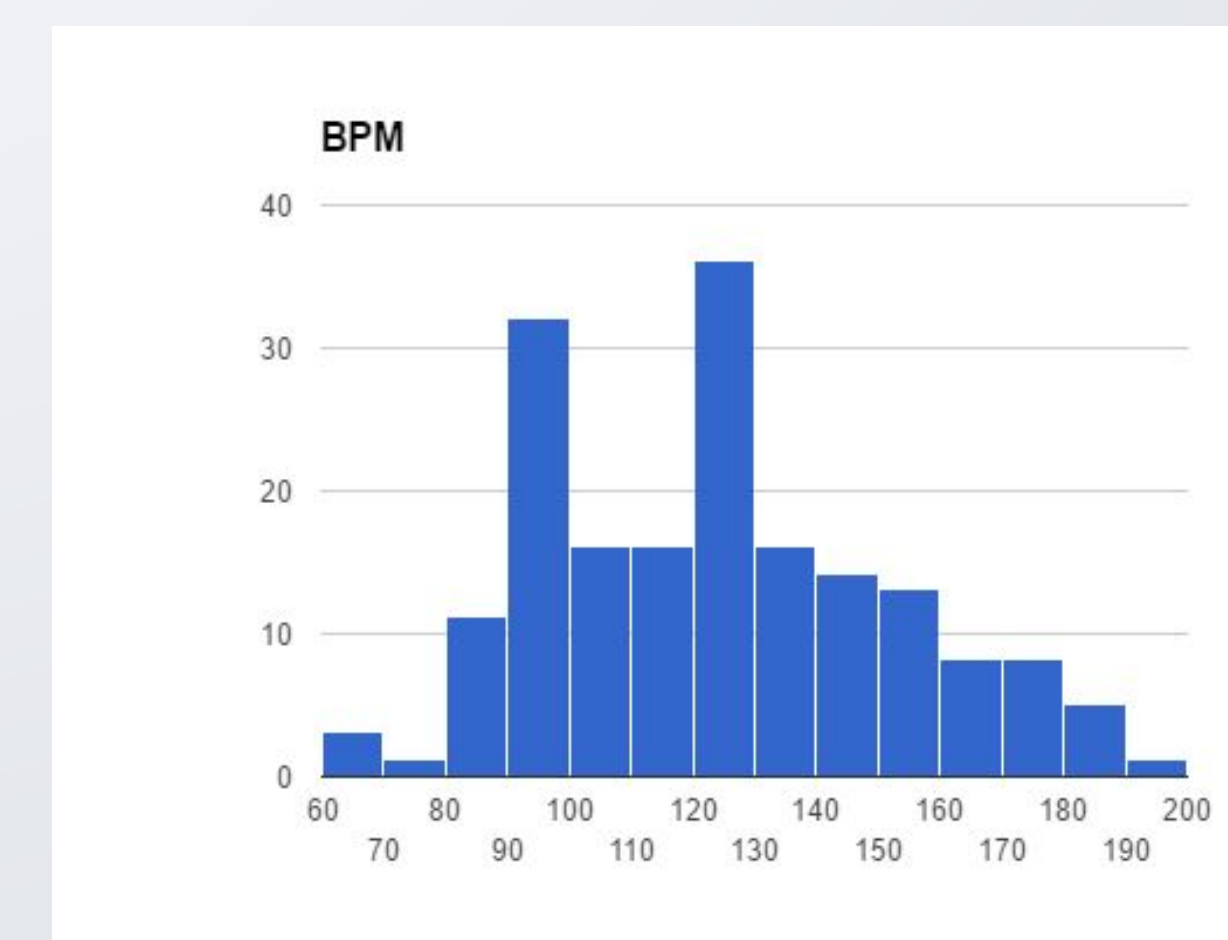
- Song title and author
- Mood during earworm occurrence
- Opinion of song
- Stress level
- Memory triggers? (someone said something that reminded you of it, you have an experience related to it, etc):
- Years of musical training (school band, choir, etc.)



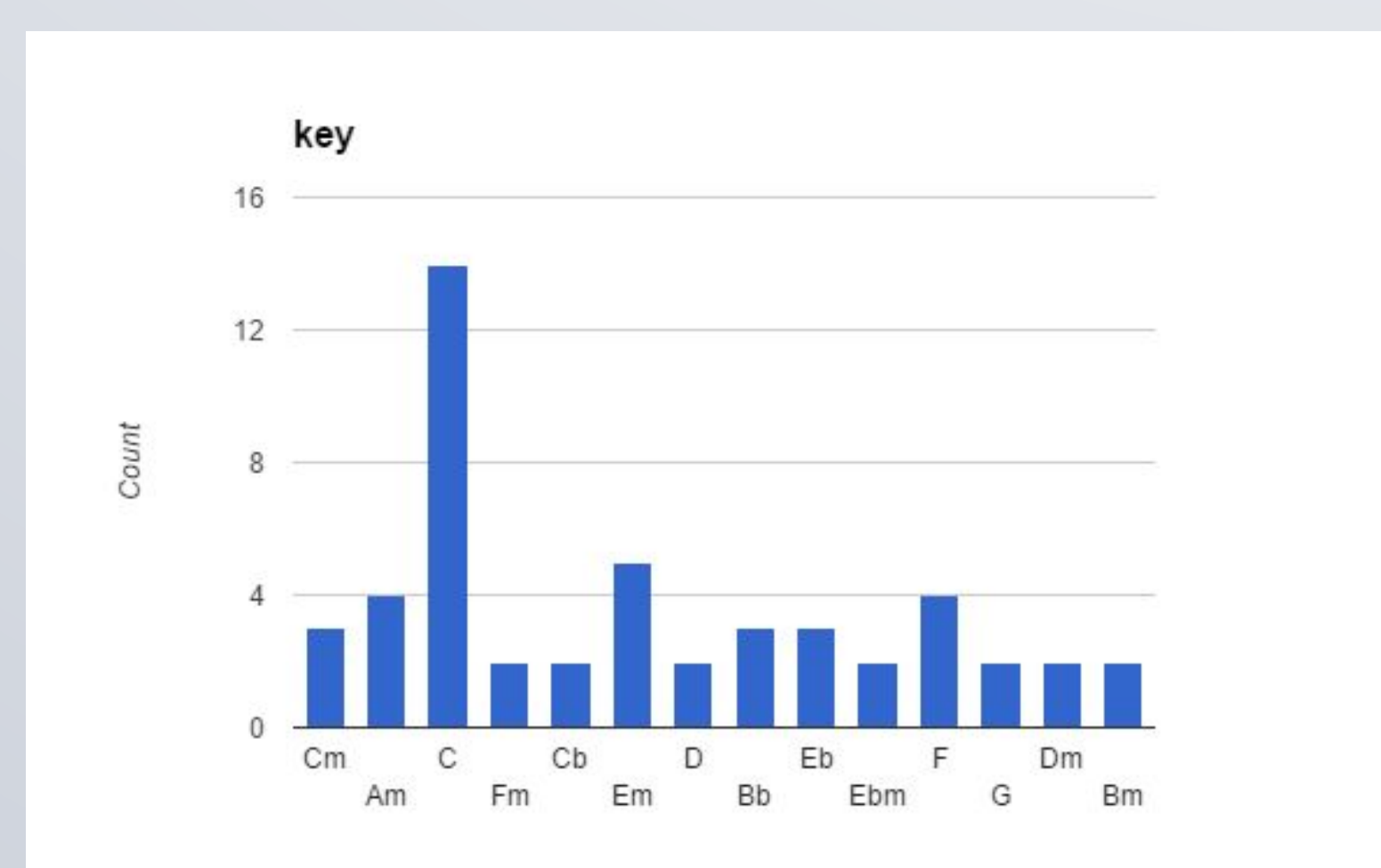
MOOD



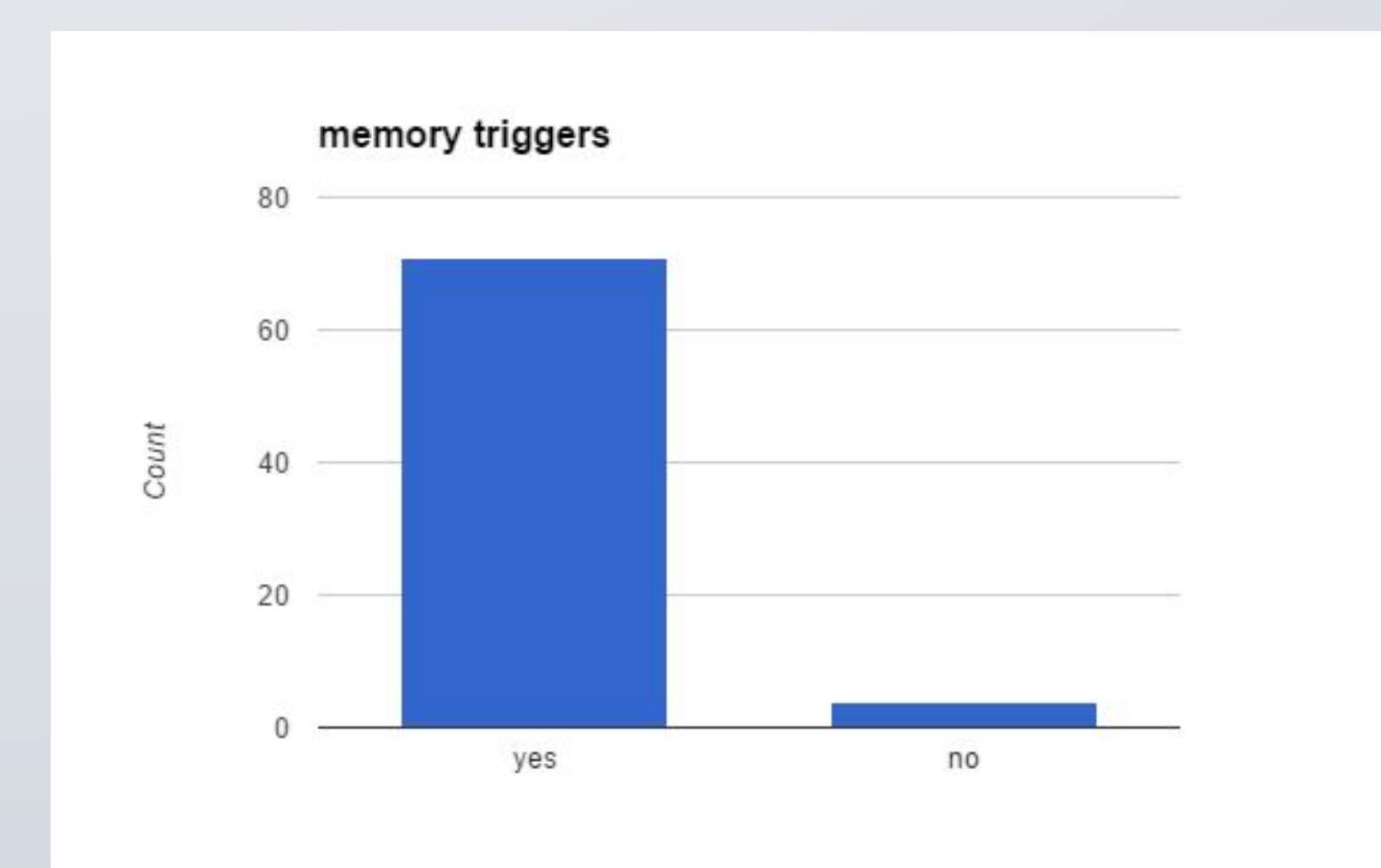
OPINION OF SONG



BPM



KEY



MEMORY TRIGGERS

RESULTS

- Once data from the studies had been placed in spreadsheets and analyzed, trends began appearing in the data. It was found that mood, participants' opinions of the song, beats per minute, key, and the presence of memory triggers had an effect on the earworms. Stress level and music training did not have common results among the earworm participants.
- Stress Level: reported 1-10 (1 being no stress, 10 being extreme stress), with no outliers. All levels were within the same range.
- Music Training: there was no amount of years of music training that caused a different amount or type of earworm, meaning there was no trend
- Mood: earworms occur most often during positive moods
- Opinion of song: earworms are usually songs the person enjoys
- BPM: most earworms had a BPM range of 90-100 or 120-130
- Key: most earworms were in the key of C
- Memory triggers: most earworms occurred following a memory trigger (reading a line from the song, someone saying something that reminded you of it, etc)

CONCLUSIONS

- The perfect earworm would be in the key of C, have a BPM of 90-100 or 120-130, the listener would enjoy the song, it would occur following a memory trigger, and it would occur during a positive mood.
- The ability to produce earworms could be beneficial in the advertising and education fields. In addition to using the key of C and BPM 90-100 or 120-130:
 - using a pre-existing popular song ensures people will enjoy the song
 - introducing the song during a stress-free school day or playing it during a happy or funny t.v. program makes a positive mood more likely

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ACKNOWLEDGEMENTS

THANKS TO DR. SWANSON, DR. MICHAEL HICKS, AND MR. RICK BUTLER FOR ALL THEIR HELP