The Influence of Music-Induced Emotional Frameworks on Moral Decision-Making

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Abstract

This study examined how music-induced emotional states influence moral decision-making in the context of the trolley problem. Building on prior research that links music to emotional regulation and cognitive processing, the experiment tested whether suspenseful (intense-positive), calm (calm-negative), or no music affected participants' likelihood of making active versus passive moral choices. Seventy-eight participants were randomly assigned to one of the three music conditions and completed pre- and post-video surveys measuring emotional state and ethical judgment. Decisions were rated on a 5-point scale, indicating the likelihood of pulling a lever in a life-or-death scenario. Chi-square tests revealed no statistically significant association between music condition and decision outcome, though participants across conditions tended to favor an active response. These findings suggest that while music may influence emotional state, its effect on moral decision-making in this context was insignificant. Implications for emotion-based decision theory and future experimental design are discussed.

The Influence of Music-Induced Emotional Frameworks on Moral Decision-Making

Research demonstrates that musical exposure modifies neural responses in the prefrontal cortex, hippocampus, and amygdala, which control executive functions, emotional regulation, and attention processing (Dan et al., 2025). Since musical reactions reveal covert influences on ethical choices, research should explore the connection between emotional reactions to music and moral decision-making.

The trolley problem is an important moral decision-making thought experiment that challenges people to make tough ethical decisions. While the experiment changes between the scenario and human/animal victims, participants find themselves beside train tracks, watching an out-of-control trolley heading toward five people who will die if it stays on its current path. Participants can operate a lever that will redirect the train to a side track where it will strike a single person instead of five people. The moral conundrum requires people to decide whether to remain inactive and let harm happen or to intervene and choose who will be harmed. This experiment has been widely studied in moral psychology to understand how people make ethical decisions under pressure (Wark & Krebs, 2000). However, little research has examined whether emotional states, particularly music-induced, can shift how people approach such dilemmas.

Music has been shown to influence cognitive biases, emotional responses, and decision-making tendencies (Liu et al., 2022; Perez Santangelo et al., 2022). Individuals may be more likely to take decisive action in moral dilemmas if certain musical stimuli evoke intense and positive emotions. When individuals experience a calm yet negative emotional state, this condition can result in passive behavior, which stops them from taking action. The investigation analyzes music's impact on decision-making during moral dilemmas such as the trolley problem

to determine if it guides people toward active or passive moral reasoning without their conscious awareness. The knowledge about these effects extends to practical ethical decision-making scenarios like leadership roles and policy creation in law enforcement, where emotions heavily affect significant decisions.

Emotional Frameworks, Music, and Moral Choices

Research evidence indicates emotions significantly influence decision-making processes, particularly in moral dilemmas, according to Wark and Krebs (2000). Moral judgments depend on mental analysis and emotional reactions since different emotional conditions produce diverse results in decision-making. According to Zhao and Zhou (2024), positive emotions result in optimistic expectations for decision results, demonstrating how mood affects moral judgment. Similarly, Liu et al. (2022) found that music can induce emotional rewards that strengthen perceptions of fairness and demonstrate that musical interventions can influence ethical thinking.

Recent research into music's influence on cognitive functions has reinforced its importance in decision-making processes. Perez Santangelo et al. (2022) found that background music changes decision-making because fast music generates swift, confident choices, and slow music encourages careful contemplation. Additionally, Nikoulina et al. (2020) showed that music can increase impulsive behavior during risky decision-making when certain conditions are present. The tempo and emotional tone of music can prepare people to make either active or passive decisions.

Research has established a basic understanding of how emotions and music affect decision-making but still lacks comprehensive studies connecting these elements with moral

dilemmas. The 2021 study by Colverson et al. demonstrated how musical experiences can enhance emotional sensitivity and affect ethical decision-making through empathic processes. Studies have not yet investigated how different emotional structures created through musical experiences affect whether people make active or passive moral decisions. The research by Wu, Wang, and Zhou (2025) emphasizes how music-induced emotions generate prosocial responses, which supports the idea that emotional valence significantly affects ethical decision-making processes. This research examines the influence of emotional frameworks on moral decision-making through a focused analysis of their effects on moral dilemmas such as the trolley problem.

Bridging Musical Influence and Ethical Reasoning

Building upon previous findings, this study investigates whether music-induced emotional states influence active versus passive moral decision-making. Specifically, participants are exposed to different music clips designed to elicit intense-positive (suspenseful) or calm-negative emotional states before responding to classic moral dilemmas. The study expands upon existing work by isolating the emotional impact of music and examining its role in ethical reasoning. While previous research has shown that mood influences decision-making, this study will determine whether specific emotional frameworks drive individuals toward action-oriented or passive moral choices.

Hypothesis and Study Design

Research into how music influences emotions and moral choices helps reveal hidden factors affecting ethical behavior. The study predicts suspenseful music-induced intense-positive emotions will stimulate active moral decision-making, whereas calm music-induced calm-

negative emotions will result in more passive choices. This hypothesis aligns with existing

findings on music's effects on cognition and decision-making (Perez Santangelo et al., 2022;

Zhao & Zhou, 2024). The study employs a survey methodology where participants listen to

music clips and respond to moral dilemmas, analyzing the effects of music-induced emotional

states. The independent variable (IV) is the music/emotional framework (suspenseful vs. calm vs.

no music control). In contrast, the dependent variable (DV) is the nature of the moral decision

(active vs. passive). A validated mood scale is used pre- and post-video to test the emotional

manipulation. By addressing gaps in prior research, this study contributes to a deeper

understanding of how emotional frameworks shape ethical reasoning.

Methods

Participants

The study included 78 participants. It collected participants via convenience sampling

from college students and individuals who were the research team's family members, friends, or

acquaintances. The study consisted of volunteers who participated without receiving any form of

financial incentives.

Participants ranged in age from 18 to over 65 years, with the most significant proportion

being between 18 and 24 years old (48.7%, $N = 38$). This was followed by those aged 25–34

(17.9%, $N = 14$), 45–54 (11.5%, $N = 9$), 55–64 (7.7%, $N = 6$), 65 and older (7.7%, $N = 6$), and

35–44 (6.4%, $N = 5$). Precise average age calculation was impossible because the data contained

age ranges instead of exact numbers, even though the sample demonstrated adult diversity with

most younger adults.

The gender identity distribution consisted of 47 females (60.3%) and 28 males (35.9%), along with two individuals identifying as non-binary or third gender (2.6%) and one participant who chose not to share their gender identity (1.3%). Participants identified as Caucasian/White (51.3%, $N = 40$), African American/Black (21.8%, $N = 17$), Asian (15.4%, $N = 12$), Hispanic or Latino (9.0%, $N = 7$), Other (1.3%, $N = 1$), or preferred not to say (1.3%, $N = 1$).

Educational backgrounds varied across the sample. Among the study's participants, 35 individuals (44.9%) completed some college courses, while 15 participants (19.2%) held bachelor's degrees, 14 participants (17.9%) had only high school education or less, and another 14 participants (17.9%) accomplished graduate or professional education.

All participants provided informed consent before participating. The informed consent process occurred twice, with participants first consenting at the survey start and then before watching the experimental video and finishing the questionnaire. The research team selected participants who gave informed consent to join the study, but the research did not employ random selection methods.

Materials

The Trolley Problem. Three versions of a short video were created using WeVideo, an online platform used for advanced video editing, and the videos contained instructions regarding the Trolley Problem. The Trolley Problem is a thought experiment well known in philosophy, forcing participants to make a high-stakes moral decision. In this scenario, a high-speed trolley is about to hit five people. If the participant pulls a nearby lever, they can redirect the trolley onto another track, where the trolley will hit one person instead of five. As such, the participant is

faced with a dilemma: do they pull the lever to save five people, or do they let the trolley run its course so that they don't kill the other person?

The three videos were all created using the same narration, railroad clips, and images, but they had different soundtracks playing over them. The first video included the second movement of Vivaldi's *Winter*, the second video included a suspense track taken from the WeVideo library, and the third video had no soundtrack. Participants were given a survey through Qualtrics, and following the demographic and pre-study questions, each person was randomly assigned one of the three videos. Participants could take the survey on any device, but were told to use headphones for the best experience.

Each survey featured the same set of questions before and after the video and in the same order. Pre-study questions assessed a person's state of ease and willingness to make a decision that caused harm to one individual for the greater good. Post-study questions assessed a person's inclination to pull (or not pull) the lever, reasoning, confidence level in their decision, and emotional state.

Design and Procedure

Design. In this experiment, we used a three-group, between-groups experimental design. We tested the independent variable of different types of music and how that affects our judgment in moral decisions utilizing the trolley problem. The trolley problem is as follows: a train is headed on its current path and is about to hit five people on the tracks; you (the person watching the video and taking the survey) can change the train's course. However, by pulling the lever and guiding the train on the second track, it will hit one person. What should one do in this situation?

Each participant received a music that was either suspenseful, calm or no music (control group) on their trolley problem video to see how music might influence our dependent variable (active or passive decision making). We used no music as our control group to see if music makes any difference in our participants' decisions. We used Qualtrics to do this randomization. Qualtrics would randomly assign each person who clicked on our survey link one of the three options, which allowed us to keep our number of recipients in each music category even.

We were able to operationalize our experiment by asking questions such as "Do you primarily listen to music for emotional regulation?" to see if music even influences our participants. We also asked, at the beginning and end of the survey, what the participants' current emotional state was to see to what degree the different types of music had on their moral decisions.

The dependent variable is the participants' response to the trolley problem, given their music type. We looked at how likely participants were to pull the lever and switch up the direction of the train to hit one person instead of five, given their music type. We had them rank their decision on a scale of 1–5, 1 being that they would not pull the lever and 5 being that they definitely would pull the lever. This was used to see if the type of music they listened to would make them act actively or passively in accordance with whether to pull the lever or not. To operationalize this, we used levels 1–5 to give our participants more room to make their decision more accurately instead of having them answer yes or no to pulling the lever.

Procedure. This study was conducted online using the Qualtrics survey platform on participants' computers. Before beginning the study, participants were presented with consent information and had to indicate their agreement to proceed.

Our study utilized a three-group experimental design, a research method where participants are randomly assigned to one of three distinct conditions to compare their effects. Participants were assigned to one of three conditions: the intense-positive music condition, the calm-negative music condition, or a neutral music condition (silence), which served as a control group. The neutral music condition allowed us to assess the impact of emotionally charged music relative to a baseline condition. Each music condition was paired with the same trolley problem video simulation for the participants to watch with the music in the background.

Before participating, participants completed a pre-experiment survey to establish their current emotional state. Following this, they listened to a music clip corresponding to their assigned condition. The music was specifically selected to induce the targeted emotional state or, in the case of the neutral condition, to maintain emotional neutrality.

After the video with the music exposure, participants had to decide between an active moral choice (e.g., pulling a lever to redirect the trolley) and a passive moral choice (e.g., not intervening). Their decisions were recorded and coded numerically on a scale of 1 to 5 (1 being a confident passive decision and 5 being a confident, active decision) for statistical analysis.

To ensure the emotional manipulation was effective, participants were asked to complete a post-experiment mood assessment using a validated mood scale (1 to 5) immediately after responding to the moral dilemmas.

After the study, participants were provided with a debriefing that explained the purpose of the study and the nature of the experimental conditions. Their participation was relevant to understanding the relationship between music-induced emotions and moral decision-making to disclose any (necessary) deception in the study.

Results

Primary Analysis

Our primary hypothesis was that those who had suspenseful music would be more active in decision-making. In contrast, those who had calm music would act more passively when responding to the trolley problem. Before conducting our primary analysis, a bar plot was created to visualize response patterns across the three music types and five decision choices in the trolley problem. Although the plot allowed us to observe distribution patterns, it is important to note that visualizations do not assess statistical assumptions such as normality—nor is normality required for chi-square analyses.

We conducted a chi-square test of independence to test whether the type of music influenced participants' decisions. Results indicated that participants did favor a particular choice, showing more inclination to pull the lever in both the calm and suspenseful music conditions, while those in the silent condition were more unsure; $\chi^2(8, N = 78) = 12.8, p = .118$. Due to the high p-value, the result is not statistically significant, as participants most commonly chose level 4 (feeling more inclined to pull the lever) regardless of the type of music that was presented.

Other Inferential Statistics

We conducted a chi-square goodness of fit analysis to determine whether participants differed in the reasoning behind their decisions. The response options included feeling responsible for pulling the lever, preserving more lives, or selecting "other," which required participants to specify their reasoning.

Results indicated that participants did not significantly favor any particular reasoning; $\chi^2(4, N = 78) = 2.05$, $p = .726$. Due to the high p-value, the result is not statistically significant. This suggests that regardless of whether calm, suspenseful, or no music was presented, participants were similarly likely to justify their decision-making in the trolley problem using any of the reasoning options provided.
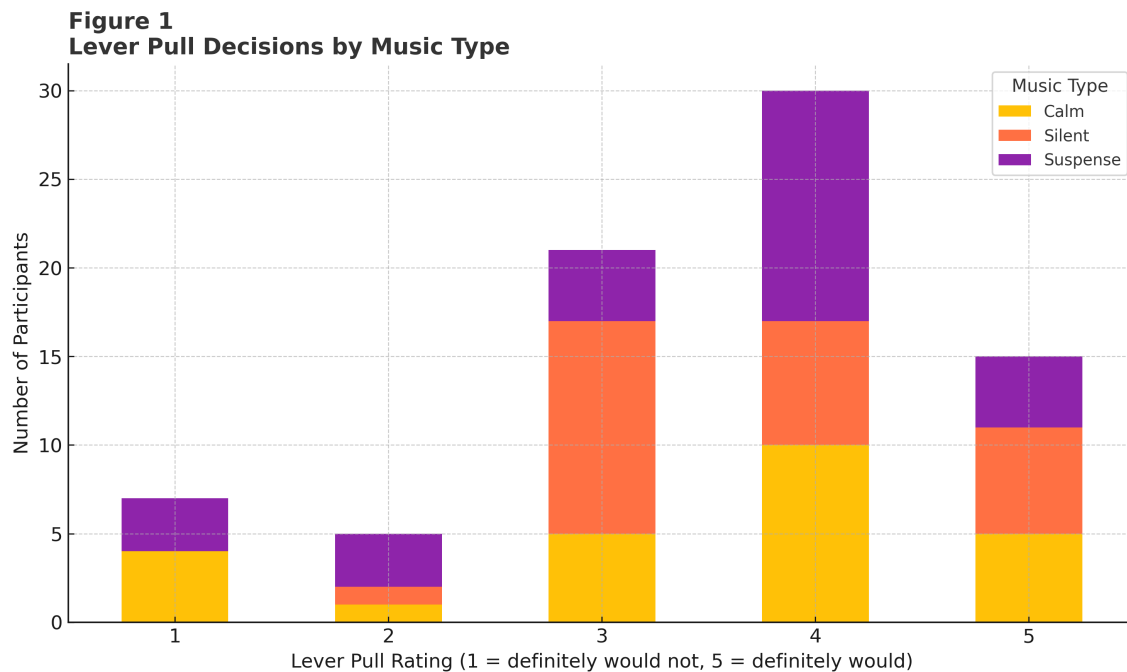
Figure 1
Lever Pull Decisions by Music Type

Figure 1. *Lever Pull Decisions by Music Type.* This stacked bar chart displays participant ratings (1–5) of their likelihood to pull the lever in a trolley problem scenario, grouped by music condition (calm, silent, suspenseful). Although suspenseful and calm music conditions showed higher frequencies at rating 4, a chi-square test revealed no statistically significant differences across conditions, $\chi^2(8, N = 78) = 12.8$, $p = .118$.
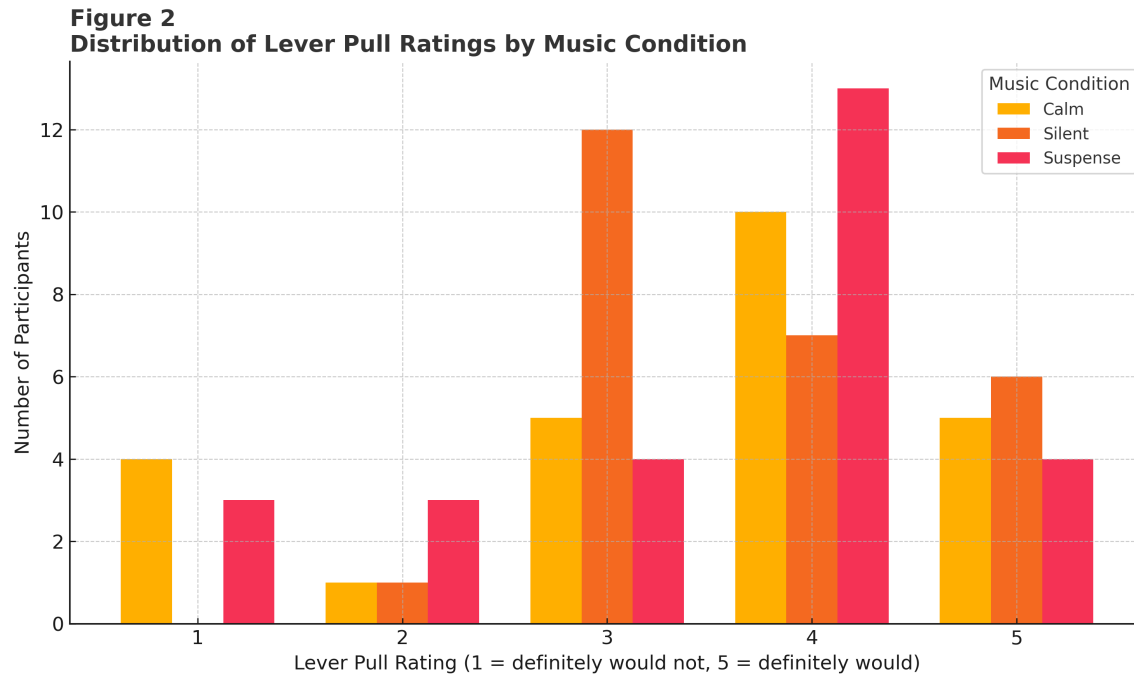
Figure 2
Distribution of Lever Pull Ratings by Music Condition

Figure 2. *Distribution of Lever Pull Ratings by Music Condition*. This grouped bar chart illustrates how participants across three music conditions (Calm, Silent, Suspenseful) responded to the trolley problem using a 5-point lever-pull scale. Although suspenseful music showed the highest number of active responses (rating 4), the overall pattern across conditions did not significantly differ, $\chi^2(8, N = 78) = 12.8, p = .118$.

Discussion

In this study, participants watched a trolley problem video paired with either suspenseful, calm or no music to explore how music-induced emotional states might influence moral decision-making. Participants completed pre- and post-surveys to assess their emotional state and their likelihood of making an active moral choice—specifically, whether to pull a lever to redirect a trolley. Decisions were rated on a 1–5 scale and analyzed using chi-square tests.

It was hypothesized that participants exposed to suspenseful (intense-positive) music would be more likely to make active moral choices. In contrast, those who heard calm (calm-negative) music would respond more passively. However, the results did not support this hypothesis. Although a trend showed that more participants leaned toward pulling the lever (i.e., making an active choice), there was no statistically significant relationship between music type and decision outcome. Participants' reasoning for their decisions didn't vary significantly across music conditions.

These findings partly contrast with earlier research. Studies like Perez Santangelo et al. (2022) and Liu et al. (2022) showed that background music can shape decision-making speed, confidence, and fairness. Other studies have suggested that music-induced emotions might enhance empathic thinking and prosocial behavior (Colverson et al., 2021; Wu et al., 2025). Our findings don't align with those results—possibly because the emotional impact of the music wasn't strong enough to override participants' baseline responses to a moral dilemma. It could also be that the trolley problem itself evokes stable, ingrained moral reasoning that's harder to shift with temporary mood changes.

Even though the results weren't statistically significant, this study still has some important takeaways. It adds to the growing research on how unconscious emotional cues—like music—might shape our ethical decisions. While we didn't find strong evidence that music influenced people's moral reasoning, this study still raises useful questions about how external environments might impact high-stakes choices. People working in law, leadership, or emergency response fields could benefit from understanding these subtle influences.

That said, there were some clear limitations. The study didn't include a direct manipulation check to confirm that the music produced our intended emotional responses. Although we asked participants to rate their emotions before and after the video, those responses weren't closely analyzed. Without that emotional confirmation, it's tough to say whether the music had any real effect. Also, the hypothetical nature of the trolley problem might not have triggered strong emotional reactions, which could explain why the music didn't make a difference.

Subsequent studies must incorporate a validated emotional manipulation check to confirm that the music effectively creates the intended mood. Research using music in realistic settings that are personal to participants could benefit from investigating moral decision-making. Additionally, recording participants' physiological responses, such as heart rate and skin conductance during decisions, would provide researchers with insights into their emotional engagement.

The study explored the impact of music-induced emotional states on moral choices using the trolley dilemma scenario. The results failed to confirm the original hypotheses but demonstrated how music, as an environmental factor, contributes to the intricate nature of moral decision-making processes. While society makes complex ethical choices within emotionally intense situations, we must consider the subtle indicators that direct these decisions.

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Appendix A: Survey Questions

Pre-Video Questions

The research team created the following questions to assess participants' emotional state, moral

decision-making tendencies, and confidence in their responses to the trolley problem scenario.

Pre-video questions were designed to measure baseline mood and moral disposition. Post-video

questions evaluated the effect of the music condition on decision-making and emotional

response.

1. How are you feeling emotionally right now?

   *(*Scale: 1 = *Very negative,* 5 = *Very positive)*

2. How willing are you to make a decision that could cause harm to one individual for the

   greater good?

   *(*Scale: 1 = *Not at all willing,* 5 = *Very willing)*

3. Do you primarily listen to music for emotional regulation?

   (Yes / No)

Post-Video Questions

1. Would you pull the lever in the trolley problem scenario?

   *(*Scale: 1 = *Definitely would not pull the lever,* 5 = *Definitely would pull the lever)*

2. How confident are you in your decision?

   *(*Scale: 1 = *Not at all confident,* 5 = *Extremely confident)*

3. What is your current emotional state?

   *(*Scale: 1 = *Very negative,* 5 = *Very positive)*

4. What was your reasoning behind your decision?

    ° I wanted to preserve more lives

    ° I felt responsible for pulling the lever

    ° Other (please explain): _____

Appendix B

Mood Scale

The single-item mood scale evaluated participants' emotional states before and after exposure to

the trolley problem video. The participants reported their current emotional state using a 5-point

Likert scale where one meant "Very negative" and five meant "Very positive." The measure

established if music manipulation impacted participants' mood states and investigated any

connection between mood changes and moral decision-making.

"How are you feeling emotionally right now?"

(1 = Very negative, 5 = Very positive)

Appendix C

Trolley Problem Video Descriptions and Links

Participants in this study were randomly assigned to watch one of three versions of a video

depicting the trolley problem. Each version included identical narration and visual content but

differed in the emotional tone of the background music. The calm music featured *Winter (2nd*

Movement) by Vivaldi; the suspenseful condition used a tense instrumental track, and the control

condition contained no music. Videos were hosted on Google Drive and linked below to allow

replication of the experimental stimuli.

Condition	Music Type	Description	Google Drive Link
A	Calm (Vivaldi)	Background: *Winter (2nd Movement)* by Vivaldi	Calm Music Video
B	Suspenseful	Background: Suspense track from WeVideo	Suspense Music Video
C	No Music (Control)	No background music	No Music Video

Participants were instructed to use headphones and randomly assigned to one of the three

experimental conditions via Qualtrics.

Appendix D

Video Thumbnails

The following still images are taken from each of the three experimental video conditions used in

the study. All videos presented the same narrated trolley problem scenario but differed in the

background music: calm (Vivaldi), suspenseful, or no music (control). These thumbnails visually

represent the participant's experience during the moral decision-making task. Each image

corresponds to the version of the video participants were randomly assigned via Qualtrics. *Note*.

The thumbnails appear identical because the video content was consistent across conditions; only

the background music varied.

Figure D1. Still from Calm Music Video

Figure D2. Still from Suspense Music Video

Figure D3. Still from No Music Video