UNIVERSITY OF SILESIA IN KATOWICE

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# DOCTORAL DISSERTATION

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## Does listening to music change peoples' moral beliefs?

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## TABLE OF CONTENTS

## LIST OF PUBLICATIONS

Below is a list of publications that are part of this thesis. To ensure full transparency, I outline my specific contributions to each publication. All articles have been adapted for the purposes of this thesis.

**Chapter 2** is a translated version of a Polish chapter from a monograph accepted for publication. Some parts of the chapter's introduction have been moved to the thesis' introduction:

> **Pypno-Blajda, K.,** & Paruzel-Czachura, M. (in press). *Muzyka a moralność: Jak dźwięki kształtują decyzje, emocje i zachowania moralne?* Wydawnictwo Naukowe TYGIEL

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**Chapter 5** is based on an article currently under revision in the journal. Some parts of the article's introduction have been moved to the theoretical part of the thesis. Additionally, the "Current Research" section differs from the submitted version, along with minor modifications throughout the other sections:

> **Pypno-Blajda, K.,** Paruzel-Czachura, M., Gkinopoulos, T., & Eerola, T. (manuscript under revision). *In the Rhythm of Morality: Listening to the National Anthem Lower Instrumental Harm. Evidence From the USA and China.*

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**Chapter 6** is based on the article during the review process in the journal. Some parts of the article's introduction have been moved to the theoretical part of the thesis:

> **Pypno-Blajda, K.,** Paruzel-Czachura, M., Xue, Ch., & Eerola, T. (in review). *When the Beat Drops, Morals Shift: How Music Influences Moral Foundations but not Moral Identity. Evidence From the USA and China.*

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# I. INTRODUCTION

Music accompanies us at every step, whether we actively seek it or not. We can consciously reach for a favorite album, but we might also accidentally hear an annoying song while commuting to work by bus. Music can include all the sounds surrounding us, not just those with diatonic melody, harmony, and regular rhythm. In the early 20th century, John Cage showed us that music could be the sounds of an audience waiting for a performance to begin, while Krzysztof Penderecki demonstrated that we could attend a concert to listen, for example, to the wail of a fire siren. Music, therefore, is continuously around us and constantly influences us, even when we are unaware of it.

Music has been regarded as a unique carrier of certain values for centuries. In The Republic (Plato, 2000), Plato defined the kind of music one should listen to in order to develop moral virtues. He recommended listening to and performing specific scales (specifically Dorian and Phrygian) because he believed they fostered virtues such as courage, strength, self-discipline, and moderation. These sounds encouraged a balance between reason and emotions. On the other hand, the Ionian and Lydian scales were undesirable, as they were thought to induce softness, laziness, and sentimentality, weakening moral character.

In line with Plato's idea that music can both enhance and weaken morality, it is worth recalling an extreme example of immoral behavior – murder, whose causes were partially attributed to music. In 2008, in South Africa, a young student killed another student at school using a samurai sword. The music of the band Slipknot heavily influenced the murderer. He committed the crime while wearing a mask resembling the style of one of the band members, leading some to believe that Slipknot's music might have influenced his actions (Michaels, 2008). Another widely discussed case related to music involved the controversy surrounding Marilyn Manson following the Columbine

High School massacre in 1999 (Petridis, 2017). Two high school students shot and killed twelve of their classmates, a teacher, and then themselves. Some believed that Manson's song lyrics inspired the students to carry out their brutal fantasies.

Although such cases are rare, they capture the imagination and spark discussions about the powerful influence music can have on thoughts, emotions, and behavior. The psychology of morality is a relatively young yet rapidly expanding field that explores external factors influencing human moral functioning. One of these factors may be music. Many studies explore the effects of music on emotions, decision-making, and behavior, while a significant amount of research also focuses on factors influencing moral decisions, emotions, and actions. However, much less attention has been given to how music can shape *moral* decisions, emotions, and behavior. Thus, how music may influence some elements of morality is the target of interest in this dissertation.

The thesis is divided into two main parts: theoretical and empirical. The theoretical part begins with Chapter 1, where I explore what it means to be moral. I discuss the challenges of defining morality, including historical and contemporary approaches, as well as unsuccessful attempts to create a unified definition. Since morality has its roots in philosophy, I then introduce key ethical theories and present three perspectives – utilitarianism, moral identity, and moral foundations theories – that have been adapted for psychological research. Additionally, I examine the dual-process theory and its critiques, using them as a foundation for developing a new approach to measuring moral judgments. I also focus on some factors that may influence or interfere with utilitarianism, moral identity, and moral foundations.

In Chapter 2, I conduct an in-depth review of experimental studies on the relationship between music and morality. This review is structured around a selected

definition of morality as a triad encompassing moral thinking, moral emotions and moral behaviors.

In Chapter 3, I provide an overview of the limitations of previous studies, specifically those discussed in Chapter 2, as well as the current state of knowledge regarding the influence of music on utilitarianism, moral identity, and moral foundations, thereby identifying a gap in knowledge that I aim to fill with the empirical part of this dissertation.

In Chapter 4, I present the methods and approaches used to design my doctoral research. I introduce two study design approaches, discussing their pros and cons, as well as a mixed approach. I then address the inclusion of additional covariates in the study, raise concerns about past trends in psychological research in Western Europe and the USA (i.e., WEIRD samples), and emphasize the importance of moving beyond such samples.

The empirical part presents two experimental studies. In Chapter 5, I examine how music with a similar meaning across different cultural contexts – the national anthem – affects moral judgments in a utilitarian framework. There, I also present the political and national connotations of the study, exploring how these factors may impact the relationship between music and moral decision-making. I also discuss the results of the study and its limitations

In Chapter 6, I investigate how happy, Western-style music influences moral identity and moral foundations. This study is divided into three parts, from Study 2a to Study 2c. Studies 2b and 2c explore in more depth the effects observed in Study 2a. Each study is followed by a separate section that discusses the results in detail, and concludes with a general discussion of all three studies and their limitations.

Lastly, I discuss the theoretical part of the dissertation, highlighting potential future directions for studying morality. Additionally, I address the empirical section, examining the findings from Study 1 and Study 2, and situating them within the broader context of moral and experimental psychology, exploring whether music can truly influence people's moral beliefs.

The tables, figures and citations are formatted according to APA7 standards, as well as the usage of the active voice throughout the text.

# II. THEORETICAL PART

## 1. What it Means to be Moral?

### 1.1. Defining Morality

The psychology of morality is both an old and a new field. It is old because philosophers have been dealing with moral issues for centuries, and discussions about morality have traditionally been reserved for philosophy, particularly ethics. Today, many proposed solutions adopt ancient approaches to a modern context. Within psychology as a distinct discipline, morality has been present in various areas. For example, developmental psychology (Piaget, 1997, 2003) introduced a well-known theory of moral development across the lifespan, which was later expanded by Kohlberg (Kohlberg, 1969, 1981a). In social psychology, elements of morality appeared in famous experiments, such as the Stanford prison experiment (Zimbardo & White, 1972) and Milgram's obedience experiment (Milgram, 1965). It was only at the turn of the 20th and 21st centuries that Haidt's research (Haidt, 2001; Haidt & Graham, 2007; Haidt & Joseph, 2004) started a new wave of studies, leading to the creation of morality as a distinct subfield of psychology.

However, despite over two decades of research in moral psychology, the field still struggles with precisely defining its subject of study. In everyday language, the terms *moral* and *ethical* are often used interchangeably (Macko, 2018). Indeed, these concepts have closely related meanings, but they do not carry the same value. According to the *Cambridge Dictionary* (2025), *morality* is defined as:

1. "A set of personal or social standards for good or bad behaviour and character."
2. "The quality of being right, honest, or acceptable."

So, morality serves as the foundation for social functioning, as it shapes the norms and expectations that guide human behavior. An individual who acts immorally –

violating the accepted standards of their community – can undermine the sense of security and disrupt social order.

*Ethics*, on the other hand, is defined in the *Cambridge Dictionary* as:

1. "Ideas and beliefs about what type of behaviour is morally right and wrong."
2. "The study or the science of morals."

Ethics is thus broader than morality, as it builds the theoretical foundations of moral rules. Simply put, morality relates to our everyday choices and behaviors, whereas ethics is concerned with examining the origins of morality and its consequences. Ethics, through philosophical analysis of principles and theories, helps us understand which behaviors are desirable and why. It also provides a set of guidelines for moral behavior that we should follow. As Bocheński points out, it is difficult to imagine life without morality, but life without ethics is quite possible (Bocheński, 1995).

However, this is just a drop in the ocean of various definitions provided by different dictionaries, repositories, textbooks, and different researchers with different approaches and theories on what morality and ethics are, how they can be conceptualized, and what they include.

### 1.1.1. Different Approaches

Most of the time, researchers do not agree on a single understanding of morality, so when they define it, they focus on different aspects. One approach that researchers adopt is to rely on what people consider moral and test the extent to which they agree with it (Greene, 2007). According to Skitka et al. (2021), this approach frees researchers from the need to define morality explicitly. However, Dahl (2023) argues that this so-called *linguistic* approach is itself a definition of morality, though not a very precise one. However, it still offers some guidance in distinguishing moral from non-moral aspects, but it must be considered within very specific contexts and situations. For example, while

marriages of pastors are accepted in Protestant churches, they would be considered immoral in the Catholic Church. Similarly, ritualistic cannibalism is morally unacceptable in Western culture, yet until recently, it was practiced by the Korowai tribe in Papua New Guinea. We do not even need such extreme examples since even if we have individuals from the same culture, the same religion, and raised in the same environment, their mutual understanding of morality can still differ. This demonstrates the limitations of the linguistic approach, which cannot be applied universally.

Another approach to defining morality focuses on its function in our lives and the consequences of failing to comply with moral rules. One perspective suggests that morality serves to "suppress or regulate selfishness and make social life possible" (Haidt, 2008, p. 70), while another views it as "the systems of cooperation that enable members of groups to survive, to reproduce, and to propagate their genes" (Krebs, 2008, p. 168). However, within this approach, the immediate consequences of behavior may not always be clear, making it difficult to determine whether a particular action was moral or not, sometimes for a long time.

Some researchers define morality as a set of traits that reflect moral identity (Aquino & Reed II, 2002). In this view, being moral means possessing certain characteristics, such as caring, compassion, fairness, friendliness, generosity, helpfulness, hard work, honesty, and kindness. But what if I possess all the traits except one? Am I still a moral person? And what if I have all but two traits – am I still moral then? This line of questioning can continue until we ask: If I only have one of these traits, am I still a good person? Additionally, what if I possess a set of other socially desirable traits but not those listed? These questions highlight that, as we move through the different scenarios, the definition of morality based on traits becomes more unclear. There are also

various philosophical approaches that assess certain virtues as either moral or immoral, but these will be addressed in the following section.

There is also the normative perspective that defines morality as a set of norms (Graham et al., 2011) and how much an individual agrees or disagrees with them, as it is in Moral Foundation Theory discussed later in this thesis. While this approach is quite popular, it presents certain challenges. In some situations, morality is considered just another social norm rather than a set of norms, raising further issues related to the objectivity and universality of this approach.

Besides the above typology suggested by Dahl (2023), there is also another approach to defining morality that may be called *evolutionary*. This is an approach provided by Curry (2016) that morality is actually a set of cooperation rules that evolved to facilitate the harmonious functioning of societies. His approach is based on evolutionary theory (Dawkins, 1989), according to which cooperation ensures the survival of the species. Curry also suggests that morality consists of mechanisms (instincts, intuitions, ideas, and institutions) that make individuals inclined to take moral actions and to form moral judgments about others (Curry, 2005). However, one may argue that morality may also be associated with conflicts, norms that may interfere with individual interests, and more abstract concepts such as justice, law, or ethical responsibility, that do not always have a clear connection to cooperation, which makes this definition incomplete.

### 1.1.2. The New Perspective

As we can see, moral psychology faces a significant challenge in clearly and objectively defining what it studies. This challenge is reflected in the fact that the entire Volume 34, Issue 2 of *Psychological Inquiry* (2023) was dedicated to exploring various ways of defining morality. However, although the original goal was to unify the definition

of morality, it had the opposite effect, leading to the emergence of new definitions. The volume focused on Dahl's technical, psychological, empirical, and distinctive definition of morality as "obligatory concerns with how to treat other sentient beings (i.e., with others' welfare, rights, fairness, and justice), as well as the reasoning, judgments, emotions, and actions that spring from these concerns" (Dahl, 2023, p. 32). In this issue, his definition was criticized, for example, for being overloaded with theories (Posada & Peña, 2023), being more philosophical than psychological (Vaish, 2023), or it was claimed that we need to adopt a completely new perspective on morality in the era of AI making moral decisions and our moral attitudes toward AI (which is not "another sentient being") (Purcell & Bonnefon, 2023). Among the numerous proposals for a new definition, Paruzel-Czachura (2023) suggested dividing morality into three distinct areas, claiming that "morality is what a person or animal does, thinks, or feels regarding the moral domain. And what is considered the moral domain is decided by that individual" (p. 95). However, this definition remains imprecise in the sense that the moral domain may vary depending on time, culture, and context, though it provides a clearer distinction and structure for morality.

Constructive criticism is always a positive tool for development, so I believe it is valuable to distance ourselves from various definitions and approach them with a certain degree of skepticism. Nevertheless, this leaves us without a single, concrete definition of morality, keeping moral psychology as a field of study with a vague object of research. This does not mean we should stop researching morality, but when studying it, we should not draw conclusions about morality itself, as we do not yet know what it truly is. It seems that morality remains elusive when it comes to a precise and universal definition. However, for the purposes of further work on this dissertation, I have arbitrarily adopted one of many definitions – the proposition by Paruzel-Czachura regarding the moral triad,

since its clear structure aligns with the further considerations in this thesis. The titular *moral beliefs*, therefore, represent one part of the moral triad related to moral thinking.

Since there are many objections regarding what morality is in psychological research and what moral psychology truly studies, it is important to mention the various philosophical approaches to morality, as morality originates from ethics, a branch of philosophy.

## 1.2. The Philosophical Approach

Morality and ethics have been central themes in philosophy for centuries, with various thinkers offering distinct perspectives on what constitutes a moral life, the nature of right and wrong, and the development of virtue. In this Chapter, I will explore the views of classical philosophers, who contributed to shaping modern understandings of morality and ethics.

### 1.2.1. Socrates and Moral Intellectualism

Socrates, one of the key figures in Western philosophy, believed that morality is not defined by laws or social rules but by an inner understanding of virtue. This understanding could be reached through knowledge and self-reflection. For Socrates, ethics was about living the "good life," which comes from developing virtues like wisdom, courage, self-control, and practice.

Socrates famously said that the unexamined life is not worth living, meaning people must constantly reflect on their actions and engage in thoughtful dialogue to understand what is truly good. He believed that moral knowledge is innate, and through reasoning and discussion, we can uncover what virtue really means. According to Socrates, people do not act immorally because they are bad but because they lack understanding of what is truly good. This idea is called *moral intellectualism* – where knowing what is good leads to doing what is good. Socrates rejected that morality should

be based on rewards or punishments, instead stressing that virtue is valuable in itself (Reale, 1993).

### 1.2.2. Aristotle and Ethics of Virtue

Aristotle, a student of Socrates, built on his teacher's ideas and created a more complete ethical theory. Aristotle's ethics, known as virtue ethics, focuses on developing good character and virtues rather than following strict rules. In his work *Nicomachean Ethics* (2008), he argues that the goal of life is eudaimonia, which means "flourishing" or "well-being," and can be achieved by practicing virtue.

For Aristotle, virtues are character traits that fall between two extremes: too little and too much. This idea is called the doctrine of the mean. For example, courage is the virtue that lies between cowardice (too little) and recklessness (too much). Aristotle believed ethical behavior comes from developing a virtuous character through practice and reason.

He also introduced the idea of practical wisdom, which is the ability to make good moral decisions by choosing the right course of action in each situation. Unlike Socrates, who thought virtue was innate, Aristotle believed virtue is learned and developed through experience (Reale, 1996).

### 1.2.3. Hedonism, Epicureanism, and Pursuit of Pleasure

Epicureanism and Hedonism both focus on pleasure as the main goal of life, but they approach it in different ways. Hedonism, in general, believes that the most important thing in life is to seek pleasure and avoid pain. According to hedonistic philosophy, pleasure is the only thing that is inherently good, and everything else is valuable only if it helps us experience more pleasure. There are different types of hedonism: egoistic hedonism, which focuses on an individual's pleasure, and altruistic hedonism, which focuses on bringing the greatest pleasure to the greatest number of people. The core idea

is that pleasure drives human behavior, and actions are considered moral if they bring about pleasure.

Epicureanism, a specific form of hedonism created by the philosopher Epicurus, also focuses on pleasure but emphasizes moderation. Epicurus believed that simple, modest living leads to the greatest happiness. Instead of seeking physical indulgence, he argued that the best pleasure comes from peace of mind and freedom from anxiety. He believed that fears about gods and death cause unnecessary pain, and overcoming these fears is essential for achieving true happiness. For Epicurus, wisdom is key in choosing the right pleasures that lead to long-lasting contentment rather than seeking instant pleasures that may later cause harm. Epicureanism also rejects the idea of an afterlife and religious rituals. Epicurus believed that focusing on enjoying life in the present and achieving a peaceful mind was more important than worrying about an afterlife or divine judgment.

In summary, both philosophies value pleasure, but hedonism focuses on seeking immediate pleasure, while Epicureanism stresses a more thoughtful and balanced approach, where mental peace and inner happiness are more important than sensory pleasure. Both agree that pleasure can lead to a good life, but they differ in how to achieve it (Reale, 2012a).

### 1.2.4. Stoicism and Equanimity

Stoicism focuses on virtue, reason, and self-control as the keys to moral excellence. The Stoics believed that the goal of life is to live in harmony with nature and reason and that true happiness comes from developing virtues like wisdom, courage, justice, and self-discipline.

Thinkers like Epictetus, Seneca, and Marcus Aurelius taught that morality is not about external events or seeking pleasure but about building strong character and responding to life's challenges with virtue.

A central Stoic idea is that we cannot control external events, but we can control our reactions to them. Therefore, moral life for a Stoic involves cultivating equanimity and responding to events with wisdom, free from excessive emotions such as anger, fear, or desire. The Stoics believed that living in line with nature and reason gives us true freedom, helping us develop moral virtue no matter what happens around us. It stresses self-control and rational choices as the foundation for moral actions and happiness (Reale, 2012b).

### 1.2.5. St. Augustine and Christian theology

St. Augustine, a Christian philosopher and theologian, contributed significantly to the development of Western moral thought by integrating Christian theology with classical philosophy. He saw morality as deeply intertwined with the will of God and the divine order, emphasizing that human life's ultimate purpose is to seek union with God.

In *The City of God* (Augustyn, 2002), Augustine argued that original sin disrupts the natural harmony between human and divine will. Moral life, in his view, involves overcoming sin and aligning oneself with God's will, as true happiness and morality stem from living according to divine commands revealed in scripture and Church teachings. Unlike earlier virtue-centered moral systems, Augustine placed salvation and divine grace at the heart of morality, asserting that human beings cannot rely solely on reason for moral guidance.

A key element of Augustine's moral philosophy was his belief in predestination – the idea that God, in His omniscience, has already determined who will receive His grace and attain salvation. Because of original sin, humans are inherently incapable of

achieving goodness on their own, and only those chosen by God can truly live a moral life. This perspective shifted the focus from individual moral effort to divine will, reinforcing the idea that morality is ultimately dependent on God's grace rather than human virtue alone (Tatarkiewicz, 2014a).

### 1.2.6. Schopenhauer and Art of Compassion

Another pessimistic philosopher, Arthur Schopenhauer, offered a distinct view of morality centered on compassion and art. Schopenhauer saw life as filled with endless suffering, driven by an irrational force that never finds satisfaction. People seek happiness but can never fully reach it, and even basic survival is uncertain. Schopenhauer believed that the only ways to lessen suffering were through compassion and art. Compassion helps us detach from our own pain by recognizing the suffering of others, while art allows us to step away from our desires and experience a moment of peace through contemplation.

In his ethics, Schopenhauer combined ideas from Indian philosophy and Christianity. He saw compassion as the foundation of morality, as it connects people and eases suffering. At the same time, he believed that art provides a way to escape the struggles of life by allowing us to see the world without the constant demands of our desires. Through deep reflection and appreciation of beauty, we can reach a higher understanding of reality. For Schopenhauer, these were the only true ways to find relief from life's hardships (Tatarkiewicz, 2014b).

### 1.2.7. Nietzsche and Overman

Friedrich Nietzsche challenged traditional moral systems, particularly those rooted in Christianity and Western philosophy. His philosophy is often described as a critique of morality, as he questioned the foundations of conventional ethical beliefs. In works like On the Genealogy of Morals (Nietzsche, 2017), he argued that traditional morality – especially the concepts of good and evil – emerged as a tool of social control,

particularly by the church and ruling elites. According to Nietzsche, modern morality promotes equality and compassion at the cost of individual greatness. He rejected ideas such as justice and altruism, believing that morality should not focus on helping the weak but rather on supporting the strong and creative individuals who drive human progress.

Nietzsche distinguished between two types of morality: master morality and slave morality. Master morality, created by strong individuals, values confidence, power, and self-determination. In contrast, slave morality, shaped by weaker individuals, emphasizes kindness, humility, and self-denial. He believed that history was a struggle between these two moralities, with the weak imposing their values over time. Nietzsche argued that society should move beyond traditional moral ideas and embrace a new way of thinking, where individuals create their own values instead of following imposed rules. His vision was centered on the concept of the "overman", a person who rises above conventional morality to live according to their own strength and creativity.

Nietzsche is often seen as advocating for a more individualistic approach to ethics, where personal strength, creativity, and the will to power are central. Rather than adhering to fixed moral rules, Nietzsche's ethical vision emphasizes personal freedom and the creation of one's own moral code (Tatarkiewicz, 2014c).

### 1.2.8. Summary

The discussion of various philosophical approaches to morality and ethics reveals the diversity of views that have shaped moral thought throughout history. Socrates believed that morality comes from understanding and knowledge, saying that if we know what is good, we will naturally do good. Aristotle added to this by focusing on virtue ethics, suggesting that living a good life is about developing good habits and traits, leading to well-being. Hedonism and Epicureanism, on the other hand, focused on the pursuit of pleasure, with Epicurus advocating for a balanced approach to pleasure that

brings peace of mind. St. Augustine, however, brought a religious perspective, emphasizing divine law and the struggle between human desires and God's will, while stoicism stressed the importance of self-control, emotional resilience, and living according to reason and nature. Schopenhauer focused on reducing suffering through compassion and selflessness. Nietzsche, instead, rejected traditional morals, encouraging individuals to create their own values and challenge societal norms.

Given all these different perspectives, it is no wonder that defining morality in psychology is so difficult. Just as philosophy has trouble agreeing on what it means to be a "good" person, psychology also faces challenges in clearly defining morality.

### 1.3. Utilitarianism

One philosophical theory about morality that has been adapted into psychology is utilitarianism. This view holds that morally right action is the one that brings about the greatest good. It is a form of consequentialism, meaning an action is judged solely by its outcomes (Tatarkiewicz, 2014b). Utilitarianism also emphasizes impartiality – everyone's happiness matters equally, so when maximizing good, one person's well-being is not more important than another's. Furthermore, the reason why an individual should promote overall well-being is the same reason why every other person should do the same.

Although earlier ideas of utilitarianism existed, the concept was formally introduced in the 18th century by Jeremy Bentham. He famously stated that human behavior is guided by two sovereign masters – pleasure and pain. We seek pleasure and avoid pain in everything we do, say, and think (Driver, 2022). He also formulated the principle of utility as a standard for both governments and individuals: actions that promote happiness or pleasure are good, while those that cause suffering or pain are bad. Bentham argued that people should make rational calculations to determine actions that

maximize overall well-being. He saw morality as a practical tool – there was no act that was inherently evil; actions were only bad because of their consequences.

John Stuart Mill continued Bentham's ideas, but he disagreed on some key points, particularly regarding happiness. Unlike Bentham, Mill argued that not all pleasures were equal. He believed intellectual and moral pleasures were superior to physical or base pleasures. He claimed that "It is better to be a human being dissatisfied than a pig satisfied; better to be Socrates dissatisfied than a fool satisfied. And if the fool, or the pig, is of a different opinion, it is only because they only know their own side of the question." (Mill, 2016, p. 19). Mill also emphasized the role of internal sanctions, such as guilt and conscience, in guiding moral behavior.

In contrast to utilitarianism, deontology focuses on acting according to moral duties and principles rather than consequences. Immanuel Kant is considered the most significant figure in this approach. According to Kant, morality is about following duty for its own sake, without concern for personal gain or emotional influence (Kant, 1785). In this approach, a morally good person obeys an abstract sense of duty, acting correctly regardless of the outcomes or the feelings of others. If someone follows their moral obligation, they have done the right thing – even if it causes suffering. Guilt or regret would be unnecessary because what matters is acting in accordance with duty (Tatarkiewicz, 2014b).

In summary, the modern divide between utilitarianism and deontology has deep historical roots. Utilitarians like Bentham and Mill argued that rationally weighing the costs and benefits of actions is a moral virtue, while Kant believed that people should act based on their moral principles, regardless of the consequences. These contrasting views shaped early discussions of moral dilemmas, which remained central in psychological research on morality for a long time.

### 1.3.1. Other Variables Versus Utilitarianism

Various factors may influence responses that align with utilitarian reasoning. One important aspect is intentionality, referring to whether harm is inflicted deliberately or as an unintended consequence. Research suggests that harm perceived as an unintended side effect is more likely to be judged as acceptable (Waldmann & Dieterich, 2007). Additionally, utilitarian responses are more frequent when moral dilemmas are presented in a foreign language (Circi et al., 2021; Costa et al., 2014; Dorfman et al., 2024) or when the decision-maker holds a position of power (Lammers & Stapel, 2011).

Demographic and cultural factors also contribute to variations in moral judgments. Studies indicate that men and younger individuals are more likely than women and older individuals to endorse sacrificing one person to save five (Arutyunova et al., 2016). Cultural differences are also observed, with Western men selecting utilitarian responses more often than Russian men (Arutyunova et al., 2016). The effect of personal force – the physical involvement of an individual in causing harm – appears to be widespread across cultures, though its interaction with intentionality remains less well understood outside Western contexts (Bago et al., 2022). Furthermore, findings suggest that individualism and collectivism are not strongly associated with utilitarian moral judgments (Bago et al., 2022).

Physiological and situational factors also play a role. Some research suggests that sleep deprivation is associated with a higher likelihood of utilitarian responses (Killgore et al., 2007). Findings on the role of alcohol consumption are mixed – some studies indicate an increase in utilitarian moral judgments (Duke & Bègue, 2015), while laboratory experiments consistently have not confirmed this effect (Arutyunova et al., 2017; Francis et al., 2019; Paruzel-Czachura, Pypno, Everett, et al., 2023).

Overall, these findings suggest that utilitarian decision-making may be influenced by multiple cognitive, social, cultural, and physiological factors. Some effects appear consistent across different contexts, while others vary depending on specific situational and demographic conditions. Thus, further research is needed to explore additional factors that may influence these decisions.

### 1.3.2. Utilitarianism in Psychological Research

#### 1.3.2.1. Traditional Moral Dilemmas

In moral psychology, instead of studying utilitarianism as a philosophical system, we analyze decision-making mechanisms that may lead to judgments consistent with utilitarian principles. One of the earliest and most popular ways is with moral dilemmas. And the most famous is the trolley dilemma, introduced by Foot in 1967. The thought experiment asks whether one should switch a lever to redirect a runaway trolley, saving five people but killing one instead. Choosing not to act results in five deaths. Moral psychologists used to link this latter decision to deontological choice, which holds that certain actions are inherently right or wrong, regardless of consequences. In this classic version, about 60–80% of participants choose to switch the track to save five lives (Baron et al., 2012; Bartels, 2008; Greene, 2007). A recent study across 42 countries with 70,000 participants found that, on average, 81% of people made this choice (Awad et al., 2020). However, most of these studies were conducted in Western countries.

A different study conducted in Papua, Indonesia, challenged the idea that redirecting the trolley is a universal response (Sorokowski et al., 2020). The Yali people, who live in the Baliem Valley, strongly rejected pushing the lever. Two key explanations were proposed. First, in Yali society, causing someone's death has severe consequences – those responsible can be killed, along with their relatives or even their entire village. This stems from a cultural belief that the relatives of the deceased must seek revenge by

taking at least as many lives as were lost. Second, their religious beliefs suggest that humans should not interfere with divine decisions about life and death.

In another study (Bostyn et al., 2018), researchers found that people are more likely to make utilitarian choices in practice than they claim in theory. Participants were given a real-life moral dilemma involving live mice that could be electrocuted. They had to choose between letting five mice be shocked or redirecting the current to shock just one. Before the experiment, 66% said they would redirect the shock. However, when faced with the actual decision, 84% pressed the button to save five mice at the cost of one.

The trolley dilemma inspired many variations to explore whether changes in the scenario affect moral choices. One of the most famous is the footbridge dilemma, introduced by Thomson in 1976. In this version, instead of switching the lever, the person must push a man off a bridge to stop the trolley and save five lives. Here, only about 20% of participants agree to push the man (Baron et al., 2012; Bartels, 2008; Greene, 2007). However, in the 2020 cross-cultural replication, 51% of participants chose to push, with the number rising to 60% among those born after 1990 (Awad et al., 2020).

#### 1.3.2.2. Dual-Process Theory and its Critique

One of the most popular theories in research on decision-making since the 1960s is the Dual-Process Theory (e.g., Evans, 2008; Greene, 2007; Kahneman, 2011). It claims that two different mental processes drive human decision-making. These processes are not fixed personality traits – people may rely on emotions in some situations and reasoning in others. The two systems involved are automatic and fast System 1, which relies on emotions and intuitions, and deliberative and slow System 2, which engages logical reasoning. In everyday life, these systems usually do not conflict, as different situations trigger one or the other. When a situation feels evolutionarily significant, such

as a direct physical threat, emotions take over, leading to intuitive choices. In contrast, when facing modern, abstract dilemmas, reasoning tends to dominate.

This theory was adopted on the grounds of moral decision-making, as when people face moral dilemmas, these systems may compete. According to this, intuitive, fast responses are connected to deontological choices, while conscious and logical thinking leads to utilitarian ones (Greene, 2001). In the classic experiment, researchers used brain imaging to study activity in different brain areas during moral decision-making (Greene et al., 2001). The dilemmas were designed similarly to the trolley problem, where people had to choose between maximizing overall well-being or avoiding direct harm. The dilemmas were divided into personal dilemmas, where the decision directly harms someone, and impersonal dilemmas, which lack direct harm or intentionality. Results showed that personal dilemmas triggered stronger emotional brain activity (Greene et al., 2001). Some personal dilemmas were easy to decide, while others took longer due to the internal conflict between emotions and logical analysis. If the emotional discomfort was overwhelming, decisions were made quickly. However, when emotions and logic clashed strongly, participants needed more time to respond.

In 2007, Koenigs and his team (Koenigs et al., 2007) refined this idea by distinguishing between low-conflict personal dilemmas (quick and easy decisions) and high-conflict personal dilemmas (more difficult, requiring longer decision times). A good example of a high-conflict personal dilemma would be a “crying baby” dilemma. In this scenario, you and other villagers are hiding from enemy soldiers in a basement during wartime. Your baby begins to cry, and you cover their mouth to prevent the sound from revealing your location. If you remove your hand, the baby’s cries will alert the soldiers, leading to the death of everyone hiding. However, keeping your hand in place will cause your baby to suffocate.

In contrast, an impersonal moral dilemma might involve receiving a letter from a reputable international aid organization requesting a $200 donation. The letter explains that this amount would provide essential medical care to impoverished individuals in another part of the world. You must decide whether it is acceptable to withhold the donation to save money for yourself. According to the Dual-Process Theory, in order to make decisions in high-conflict dilemmas, the decision-maker needs significantly more time as the two systems come into conflict with each other.

However, while the existence of the two aforementioned systems is not disputed, the clear and definitive distinction between them, though appealing, has been called into question (De Neys, 2023). Many studies, including both correlational (with brain imaging) and experimental research (also those focusing on time pressure or cognitive load while answering moral dilemmas so as not to give time to activate System 2), support the theory (e.g., Moore et al., 2008; Paxton et al., 2012). However, recent replications do not confirm these findings (e.g., Białek & De Neys, 2017; De Neys & Pennycook, 2019; Gürçay & Baron, 2017), which is connected to the replication crisis discussed in section 4.4. Therefore, we can assume that it is not possible to definitively state that these two systems are completely separate (Conway & Gawronski, 2013) or that one System is totally responsible for making intuitive or reasonable decisions. A key point is that people can intuitively understand logical principles in classic reasoning tasks without careful thought (De Neys & Pennycook, 2019) and that System 2 response can also be intuitive (Burič & Konrádová, 2021). As a result, we need alternative approaches in moral decision-making psychology, as the emotional deontological and logical utilitarian decision model has lost relevance and credibility.

#### 1.3.2.3. The New Approach to Measuring Utilitarianism – Instrumental Harm and Impartial Beneficence

Since Bentham introduced utilitarianism in the 18th century as a way to maximize benefits, little has changed in how this idea is perceived. Utilitarianism, as understood in this way, has been repeatedly criticized for being too materialistic, treating people as objects, or being too hedonistic (see the review: Stoinski, 2014). However, most of this criticism pertains to a negative interpretation of utilitarianism. In this view, the focus is on maximizing good, but always at the cost of something, typically human harm or even death. Yet, utilitarianism is more than just harming others. It also involves maximizing the overall good without any benefit to the decision-maker. This perspective casts the criticized view in a different light, highlighting its positive aspects (Singer, 2015). The philosophical foundation of utilitarianism lies in the impartial maximization of the greater good. Adopting a completely impartial moral point of view means treating the good of each individual as equally important. One should not prioritize their own good or the good of family, friends, countrymen, or even fellow humans. However, it should be noted that such moral impartiality is not the same as altruism or self-sacrifice. A person may not hesitate to risk their life to save a drowning child while still not giving up a comfortable lifestyle. Ordinary "common-sense" morality encourages modest acts of altruism (e.g., helping a beggar or occasionally donating to charity), but complete impartiality demands more. In fact, utilitarianism forbids giving special priority to loved ones over others (saving the lives of fellow citizens or even family members over strangers) and suggests that people should sacrifice themselves for the greatest enemies.

However, even if someone supports moral impartiality, one might still think they should not take certain actions to achieve it. Denying the existence of such limitations is a negative aspect of classical utilitarianism. People should generally speak the truth, keep promises, and avoid harming innocent people – but only when these actions lead to a better, impartial outcome. When these principles stand in the way of achieving such an

outcome, moral rules may and should be broken. The most central of these rules concerns the so-called *instrumental harm*, or the willingness to harm or even kill others when it is necessary to achieve a better result. This willingness can be observed when someone pushes an innocent person off a bridge to save a larger number of lives. But it can also be seen in more realistic examples, such as when someone believes torture is morally acceptable if necessary to reduce the risk of a serious terrorist attack or supports so-called *active euthanasia* or abortion of severely disabled fetuses. Dilemmas involving sacrificing something for the greater good are the most dominant paradigm in contemporary moral psychology (Christensen & Gomila, 2012), and they are widely considered a reliable measure of decision-making connected to utilitarian reasoning (Kahane et al., 2018). However, this approach has also been criticized, for example, for the artificial nature of the typical scenarios used (Bauman et al., 2014). Traditional moral dilemmas mainly focus on decisions related to instrumental harm – the idea of causing harm for the greater good (Kahane et al., 2018). While these dilemmas have helped researchers understand attitudes toward this kind of reasoning, they do not fully capture the different ways people make decisions that align with utilitarian ideas. To get a clearer picture, it is important to use additional measures.

Kahane and colleagues introduced a new way of thinking about utilitarianism in the Oxford Utilitarianism Scale (OUS; Kahane et al., 2018). This scale has two parts: impartial beneficence and instrumental harm. The first one reflects the positive side of utilitarian thinking, where a person chooses to maximize overall benefits, even if it means making a personal sacrifice – like donating a kidney. The second part, instrumental harm, refers to the idea of harming someone to achieve a greater good, such as killing innocent people to save a larger group. This is the aspect that most past research on utilitarianism has focused on.

Kahane's scale is also unique because of how it measures these ideas. Instead of using traditional moral dilemmas, it presents single-sentence statements taken from philosophical discussions about utilitarian thinking.

Although this approach provides a broad way of looking at utilitarianism, it does not address the common misunderstanding that deontology is simply the opposite of utilitarianism. However, this measure was not designed to explore decision-making based on deontology – another approach discussed next focuses on that issue.

#### 1.3.2.4. The New Approach to Measuring Utilitarianism – Sensitivity to Consequence, Sensitivity to Norms, and General Tendency for Inaction in the CNI Model of Decision-Making

In moral dilemmas, choices aligned with utilitarianism have traditionally involved taking action (e.g., switching a lever or pushing a man off a bridge), while choices aligned with deontology were associated with inaction (Crone & Laham, 2017). However, researchers noticed that some people prefer inaction not due to deontological reasoning but for other reasons. To address this, Conway and Gawronski (2013) introduced a third factor alongside utilitarianism and deontology: the preference for inaction, which had previously been mistaken for deontological reasoning. They developed scenarios where an immoral action leads to worse outcomes than doing nothing. In such cases, both utilitarian and deontological perspectives reject the action. For example, if a police officer decides to torture a prisoner to find out the location of harmless paint bombs, both views would condemn this action.

In real life, moral choices are rarely as clear-cut as pushing someone off a bridge to stop a runaway train. According to this model, choosing action in dilemmas where moral norms forbid it – while recognizing that the benefits outweigh the costs – is necessary but not sufficient to classify a decision as utilitarian. Deontological judgments

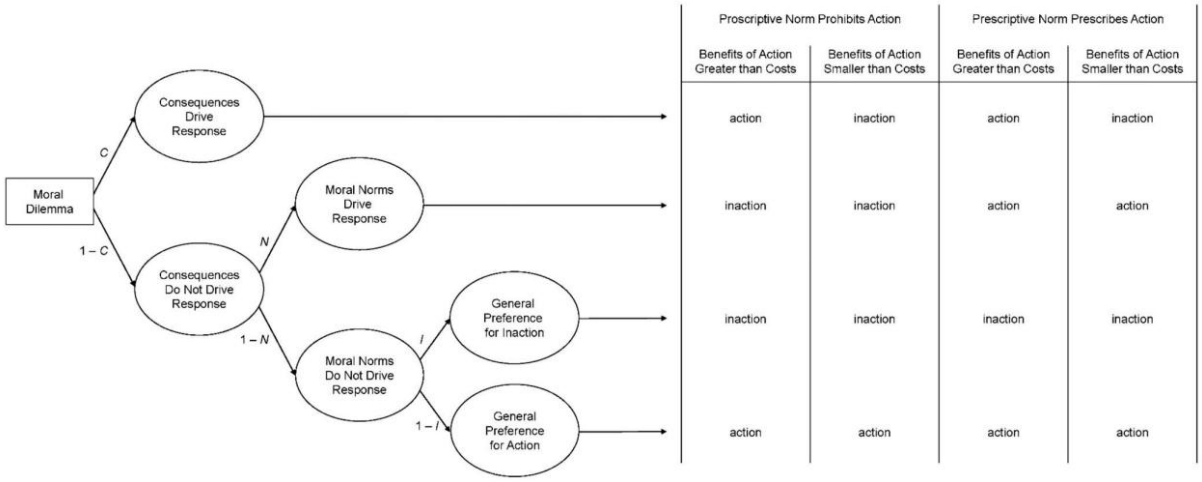
require sensitivity to moral norms, but this cannot be inferred from a single judgment. It requires comparing multiple dilemmas with different moral norms (Gawronski & Beer, 2017).

Building on this, Conway and Gawronski (2013) started treating utilitarianism and deontology as independent frameworks. In 2017, they introduced the CNI Model (Gawronski et al., 2017), which included 24 moral dilemmas in two versions: one asking if an action is acceptable and another asking if the participant would personally take the action. However, because the 24-dilemma model was not ideal for studying individual differences, Gawronski and Körner (2020) later expanded it to 48 dilemmas, focusing only on whether the participant would take action. This model measures three parameters: (1) sensitivity to consequences (*C* parameter) – considered close to traditional utilitarianism, (2) sensitivity to moral norms (*N* parameter) – aligned with traditional deontology, (3) general preference for inaction (*I* parameter) – a new measure in moral psychology, reflecting reluctance to act regardless of norms or consequences.

Each dilemma is carefully designed to reflect a specific variable, with six (in shorter version) or 12 (in longer version) types of dilemmas and four variations of each. These variations differ in whether moral norms prohibit or require action and whether the overall benefit outweighs the harm. The model uses a multinomial processing tree framework to separate the effects of different factors on categorical responses happening at the same time. By analyzing participants' judgments across different dilemma types, the multinomial model quantifies sensitivity to consequences answers (first row of Figure 1), sensitivity to moral norms (second row of Figure 1), and a general preference for inaction versus action, independent of consequences and norms (third vs. fourth rows of Figure 1).

**Figure 1**

*A Multinomial Processing Tree Model of CNI*




*Note.* Source: Gawronski et al., 2017.

Here are the four different types defined by the authors using the example of the assisted suicide dilemma:

(1) A dilemma in which a proscriptive norm prohibits action, and the benefits of action are greater than the costs:

„You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony, and you know that his condition will never improve. For days, he has been waiting for his death. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. You could give him a drug causing his death, which will release him from his pain. In this case, would you provide your patient with this drug? YES/ NO"

(2) A dilemma in which a proscriptive norm prohibits action, and the benefits of action are smaller than the costs:

„You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony, but you know that he will get better again soon. For days, he has been waiting to see improvements. Since he no longer wants to endure his pain, he repeatedly asks you to end

his life. You could give him a drug causing his death, which will release him from his pain. In this case, would you provide your patient with this drug? YES/ NO"

(3) A dilemma in which a prescriptive norm requires action, and the benefits of taking action are greater than the costs:

„You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony, but you know that he will get better again soon. For days, he has been waiting to see improvements. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. Suddenly, he has a severe heart attack. You could give him a drug to save him from dying. In this case, would you provide your patient with this drug? YES/ NO"

(4) A dilemma in which a prescriptive norm requires action, but the benefits of taking action are smaller than the costs:

"You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony and you know that his condition will never improve. For days, he has been waiting for his death. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. Suddenly, he has a severe heart attack. You could give him a drug to save him from dying. In this case, would you provide your patient with this drug? YES/ NO" (Gawronski et al., 2017)

Dilemmas of the same type (e.g., the assisted suicide dilemma) are not presented one after another. They are presented to the participants in randomized order. So, by the time a new version of the same dilemma appears, participants often do not remember the previous version or their previous answer. This prevents them from being influenced by their past decision and allows them to evaluate each dilemma independently. Each time, they can consider whether the consequences of the action are acceptable, whether moral

norms prohibit the action, and whether the overall balance of benefits and harms justifies taking action or not.

Although this approach seems to address most of the limitations in research on moral decision-making, it also has its drawbacks. The measure is lengthy and time-consuming (completing the version with 48 dilemmas takes participants about 40 minutes on average). The questions require significant focus, continuous reading, and reflection, making it challenging for participants. Therefore, when testing participants with the CNI model, it is worth considering introducing additional attention checks to ensure responses are not random or to break the text into smaller parts so that each dilemma appears separately on the screen.

**1.3.2.5. Summary**

The conceptualization of utilitarianism in psychological research has evolved significantly since the introduction of the trolley dilemma in the 1960s. Initially, moral judgments based on utilitarian orientation were examined through simple moral dilemmas contrasting action and inaction, often equating utilitarian choices with taking action for the greater good. Over time, researchers have developed more nuanced approaches to studying moral decision-making. Today, there are three main perspectives: (1) the traditional approach based on the classical trolley dilemma and its modifications, (2) two-dimensional model models exploring the positive and negative side of utilitarianism, and (3) the multinomial CNI model, which separate sensitivity to consequences, moral norms, and a general preference for inaction. Each approach has its strengths and limitations, contributing to a more comprehensive but still debated understanding of moral decision-making.

However, it is important to note that in all currently available utilitarianism measures, we are not actually measuring utilitarianism itself. That is, we do not present

participants with the philosophical principles of utilitarianism and ask them how much they agree or disagree with them. Instead, we present an already conceptualized utilitarian idea and examine whether participants agree with a given situation (e.g., OUS) or whether they would act in a certain way as presented in a dilemma (e.g., trolley dilemmas and dilemmas from the CNI model). Therefore, when drawing conclusions from studies using such measures, we should not make claims about utilitarianism *per se* but rather about how participants responded to a specific situation – one that may be classified as reflecting utilitarian principles. This distinction is crucial because it shows that different mechanisms may influence moral decisions in such dilemmas, and other factors may also play a role beyond just utilitarian or deontological reasoning. As such, it is important to refrain from overgeneralizing participants' responses as purely utilitarian or deontological.

### 1.4. Moral Identity

Another concept that has been integrated into psychology is moral identity – a multifaceted and challenging concept to define. It is not just about knowing what is right and wrong but about how deeply moral values are connected to a person's sense of self. As discussed in the previous section of this Chapter, morality itself is a broad and complex idea. It includes different perspectives from philosophy and psychology, making it hard to define in a single way. Similarly, identity is a fundamental psychological concept that refers to how people see and define themselves within social categories. It includes self-concept (the way we think about ourselves), self-categorization (how we place ourselves in social groups), and the combination of different roles, beliefs, and values into a clear sense of self (Akerlof & Kranton, 2000).

Based on this, moral identity is the extent to which morality is an important part of a person's self-concept. It describes how much a person sees moral values as a key part

of who they are. There are many different approaches to moral identity. Most theories fall into two main categories: *trait-based* and *socio-cognitive* perspectives (Hardy & Carlo, 2011; Hertz & Krettenauer, 2016; Krettenauer et al., 2022). Of course, these do not cover all theoretical perspectives (see Krettenauer, 2022), but they remain the dominant frameworks in psychological research on moral identity.

### 1.4.1. Trait-Based Perspective

From a trait-based perspective, moral identity is seen as a stable character trait that influences a person's tendency to act morally across different situations and over time. Augusto Blasi (Blasi, 1983, 2004) was one of the most influential scholars in this approach, emphasizing that moral identity provides coherence and consistency to the self. He argued that morality becomes central to a person's identity when it aligns with their values and goals.

Blasi (1983) proposed the Self Model, which explains how moral judgment translates into moral action. According to this model, three key factors play a role: (1) judgment of responsibility – a person must not only recognize an action as moral but also see it as their personal duty; (2) moral identity – the extent to which morality is an essential part of one's self-concept influences how responsibility is judged; (3) self-consistency – people have a natural tendency to act in ways that align with their self-image. If morality is central to one's identity, maintaining self-consistency serves as a strong motivation for moral behavior. In summary, Blasi suggested that moral judgments are more likely to lead to moral actions when they are processed through a sense of personal responsibility and reinforced by the desire for self-consistency (Frimer & Walker, 2009; Hardy & Carlo, 2005; Walker, 2004).

Beyond Blasi's approach, researchers have proposed different ways of understanding moral identity. E.g., moral identity as an altruistic personality (Carlo,

2005) or narrative moral identity (Narváez & Lapsley, 2009). In the first approach, moral identity is seen as closely linked to the concept of an altruistic personality – a set of traits such as empathy, social responsibility, and moral reasoning that encourage prosocial behavior and reduce antisocial tendencies (Staub, 2005). The second approach focuses on how people construct their sense of self through life stories (McAdams, 2009). There, moral identity is reflected in the extent to which moral values and themes are deeply embedded in one's personal narrative. In other words, people with a strong moral identity see their life stories shaped by moral concerns and commitments.

### 1.4.2. Socio-Cognitive Perspective

From a social-cognitive perspective, moral identity's importance varies across individuals and contexts, shaping moral functioning (Aquino & Reed, 2002). It is a self-concept based on moral traits, distinct from personality traits, that differ in significance to one's identity (Aquino & Reed II, 2002; Krettenauer & Hertz, 2015). Social cognitive models suggest that situational cues can activate or suppress the moral self-concept.

The most popular approach in this perspective is the self-importance of moral identity (SIMI). SIMI is the level to which being a moral person is essential to a person. It has two types: being moral for us (internalization) and showing to be moral to the outside world (symbolization). It indicates the importance of morally desirable traits (i.e., caring, compassionate, fair, friendly, generous, helpful, hardworking, honest, and kind) to a person's overall identity. Moral traits are networked, so activating one trait should trigger the entire set of traits that make up a person's moral self-concept (Aquino & Reed II, 2002). Suppose a person has a strong sense of self-identity, and being a morally good person is part of that identity. In that case, such a person will be more likely to behave morally to be consistent with their identity (Aquino et al., 2009). SIMI also impacts real-life behaviors: the meta-analysis showed that higher moral identity strengthens

individuals' willingness to engage in pro-social and ethical behavior (avoidance of harmdoing or actively promoting others' well-being), as well as to refrain from antisocial behavior (prohibited and sanctioned) (Hertz & Krettenauer, 2016). However, unlike in the trait-based perspective, situational factors can influence the degree to which the moral identity is activated (Aquino et al., 2009; Monin & Jordan, 2009).

Other approaches within the socio-cognitive perspective include the concept of chronically accessible moral schemas, commitment to moral social roles, or moral ideal self. Chronically accessible moral schemas suggest that moral identity involves mental frameworks (schemas) that help us interpret and respond to social situations. When these schemas are deemed important to our identity, they become more accessible, allowing us to process and act in moral ways automatically. People with accessible moral schemas are often quicker and more adept at moral decision-making, similar to experts in fields like chess or music (Gibbs, 2014; Lapsley & Narvaez, 2004). The commitment to moral social roles, where moral identity is connected to social roles, such as being a volunteer or blood donor. It is shaped by how central these roles are to a person's self-concept (Pauer-Studer, 2006). Lastly, the moral ideal self links moral identity to the version of ourselves we aspire to become. When a person's ideal self is moral, it motivates them to act in ways that align with their moral aspirations (Oyserman & James, 2011).

### 1.4.3. Other Variables Versus Moral Identity

A meta-analysis of 111 studies identifies several factors that may be connected with moral identity (Xu et al., 2021). Personality traits such as agreeableness, conscientiousness, and integrity are positively correlated with moral identity, while neuroticism has a negative relationship. In the organizational context, ethical, servant, transformational, and authentic leadership all positively impact moral identity.

Conversely, leader narcissism and abusive supervision show no significant effects. Additionally, the ethical climate is positively related to moral identity.

Demographically, men tend to rate moral identity as more important than women (Xu et al., 2021), though a Polish study suggests the opposite (Paruzel-Czachura & Blukacz, 2021). Age and education seem to have no significant relationship with moral identity (Xu et al., 2021), such as alcohol intoxication (Paruzel-Czachura et al., 2024). However, situational factors, such as financial incentives during negotiations, can reduce moral identity accessibility. In these cases, individuals with high moral identity centrality showed increased intentions to lie (Aquino et al., 2009).

### 1.4.4. Moral Identity in Psychological Research

In psychological research, moral identity is mostly tested by two measures rooted in the socio-cognitive perspective: the Self-Importance of Moral Identity Scale and the Moral Identity Questionnaire.

#### 1.4.4.1. The Self-Importance of Moral Identity Scale

As described in the previous section, the self-importance of moral identity is a concept where the centrality of being a moral person plays a crucial role in an individual's self-concept. In the measure proposed by Aquino and Reed (2002), the self-importance of moral identity is assessed using the internalization and symbolization subscales, each with five questions. The internalization subscale assesses the extent to which one values moral traits, while the symbolization subscale identifies whether one's actions demonstrate a commitment to moral self-expression or commitment, such as through group membership or activities considered moral.

In the research with the Self-Importance of Moral Identity Scale, participants are instructed to read a list of nine characteristics of a moral person (i.e., caring, compassionate, fair, friendly, generous, helpful, hardworking, honest, and kind), then, to

visualize how someone with these traits would feel, act, and think. Only then are they asked to indicate how important in for them to possess these traits, e.g., “It would make me feel good to be a person who has these characteristics,” or “Having these characteristics is an important part of my sense of self” for internalization subscale and “The types of things I do in my spare time (e.g., hobbies) clearly identify me as having these characteristics,” or “I am actively involved in activities that communicate to others that I have these characteristics” for symbolization subscale.

#### 1.4.4.2. The Moral Identity Questionnaire

The Moral Identity Questionnaire (MIQ; Black & Reynolds, 2016) is also based on the socio-cognitive approach discussed above. It evaluates how individuals prioritize their moral principles and the importance they place on acting in accordance with these principles. The MIQ is based on two factors, which include moral integrity and moral self.

The moral integrity subscale measures the alignment between intention and action, assessing how much value individuals place on acting according to their moral principles. It evaluates integrity in terms of both private and public actions. Sample items include: “Once I’ve made up my mind about what is the right thing to do, I make sure I do it” and “There is no point in going out of my way to do something good if no one is around to appreciate it.”

The moral self subscale focuses on how closely participants identify with moral values as part of their self-concept. When individuals see themselves as moral beings, they are more likely to interpret situations morally and act in accordance with their values. Sample items from this subscale include: “Not hurting other people is one of the rules I live by” and “I want other people to know they can rely on me.”

#### 1.4.4.3. Summary

This section explored different perspectives on moral identity, from the trait-based approach, which sees it as a stable personality characteristic, to the socio-cognitive approach, which emphasizes its flexibility and dependence on situational factors and is more popular in psychological research. However, there is no single, universally accepted definition or understanding of the nature of moral identity. When researchers talk about moral identity, do they always mean the same thing? Certainly not. This lack of clarity highlights the need for continued research across various disciplines. Perhaps, in the future, we will achieve a more precise understanding of morality as a whole and moral identity in particular.

### 1.5. Moral Foundations Theory

Moral Foundations Theory (MFT; Graham et al., 2009; Haidt & Graham, 2007; Haidt & Joseph, 2004) proposes that human moral judgments and intuitions are based on a set of innate, evolved psychological mechanisms shaped by cultural and social influences. The theory suggests that morality is not solely based on harm and fairness (as traditionally emphasized in Western moral philosophy; see section 1.2.) but is instead built upon multiple distinct foundations that vary across cultures and individuals.

Originally, MFT identified five universal moral foundations: care, fairness, loyalty, authority, and purity (Graham et al., 2011). Research suggests that individuals vary in their preferences for moral foundations based on factors such as their religious beliefs (Saroglou & Craninx, 2021) or political affiliations (see the review: Kivikangas et al., 2021). Moral foundations are relatively independent of one another. This means that a specific behavior may be considered moral according to one foundation but immoral according to another. For example, concealing the truth about the misconduct and mistakes of one's professional group may be seen as morally justified from the perspective of the loyalty foundation, even if these mistakes cause harm to others.

However, from the perspective of the care foundation, such an act would be considered immoral.

According to MFT, these foundations emerged as responses to evolutionary challenges. Natural selection has shaped the human mind to quickly and easily learn to monitor at least five key areas of behavior – both one's own and that of others – and to respond appropriately. This process underlies the formation of the five core moral foundations (Graham et al., 2013). Care refers to empathy for others. Fairness is a foundation of sensitivity to justice, rights, and equality. Both of these foundations function to protect individuals and are classified as individualizing foundations. Loyalty is about a willingness to form groups and feeling proud of being a member of such groups. Authority relates to a preference for a hierarchy. Finally, the purity (earlier named sanctity) foundation is the expression of disgust in response to incorrect behavior. The last three foundations ensure cohesion, stability, and the efficient functioning of groups larger than a dyad. These foundations are categorized as binding foundations (Graham et al., 2011; Haidt & Graham, 2009).

During recent developments on the cross-cultural sample, researchers proposed splitting fairness into two distinct foundations: equality (the belief in equal treatment and outcomes for all individuals) and proportionality (the idea that rewards should be based on merit and contribution), making six basic foundations (Atari et al., 2023). In this revised approach, the previous theory's individualizing-binding distinction is no longer present. Research by Atari et al. (2023) suggested that this distinction may actually be culture-dependent. The segregation of moral values into entirely isolated categories (individualizing and binding) appears to be a Western phenomenon rather than a universal feature of the moral domain

### 1.5.1. Other Variables Versus Moral Foundations

Research on moral foundations suggests that language plays a significant role in shaping moral judgments. In foreign languages, people tend to make less harsh moral judgments regarding actions that violate purity, fairness, and loyalty norms (Geipel et al., 2015). Similarly, higher scores in harm, purity, and fairness are obtained in foreign and regional languages compared to the national language (Peressotti et al., 2024). Further studies also suggest that alcohol consumption can influence moral judgments, particularly in the care and purity foundations, making individuals more willing to harm others and behave impurely (Paruzel-Czachura, Pypno, & Sorokowski, 2023). Some argue that moral foundations may be genetically inherited (Zakharin & Bates, 2023). Others propose that these foundations remain largely stable (Haidt, 2012).

Ingroup and outgroup dynamics also shape moral judgments. People tend to rate ingroups higher on loyalty, while outgroups are rated lower on harm and fairness, reflecting an ingroup bias that protects group welfare (Winget & Tindale, 2020). However, no significant differences were found between ingroups and outgroups on authority and purity. Additionally, culture, ethnic identity, and gender play crucial roles in moral foundations, with the interaction of these factors influencing harm, loyalty, and purity (Khan & Stagnaro, 2016). Evidence from 67 countries suggests that women tend to score higher on care, fairness, and purity, while men score higher on loyalty and authority (Atari et al., 2020), with women showing a higher tendency for individualizing foundations and men for binding ones (Atari et al., 2020; Paruzel-Czachura, Blukacz, Vecina, et al., 2023; Pypno-Blajda, Paruzel-Czachura, Baran, et al., *in review*).

They also relate to real-life ethical behaviors. For instance, higher individualizing foundations (care and fairness) were related to lower violence (Silver & Abell, 2016; Silver & Silver, 2021), whereas higher binding ones (loyalty, authority, purity) to group

marijuana use (Silver & Silver, 2021) and group unethical behaviors like pornography use (Silver & Abell, 2016). Prior research has also linked psychopathy with deviations in all five moral foundations (Jonason et al., 2015).

Research on moral foundations emphasizes that various factors may influence our moral values. This has significant implications for understanding how people function morally, as it suggests that our morality is not solely based on universal principles but is shaped by individual, cultural, and situational factors. Studying these influences is crucial because it helps us better understand the complexities of moral behavior, how societal norms are formed, and how we can address ethical conflicts in diverse contexts.

### 1.5.2. Moral Foundations in Psychological Research

Moral foundations can be assessed using different approaches, and in psychology, four of the most popular measures are used to evaluate them.

#### 1.5.2.1. Moral Foundations Questionnaire

The Moral Foundations Questionnaire (MFQ) was developed by Haidt and Graham (2007) and consists of 30 items divided into two subscales. The first subscale – relevance of moral foundations – measures the direct assessment of the importance of a given moral foundation. It includes 15 items that explicitly ask how important a specific criterion is for the participant (e.g., "When judging someone's behavior as good or bad, how important is it to you whether someone suffered emotionally?" for care, or "Whether or not someone did something disgusting" for purity). Responses are given on a scale from 1 = *not at all relevant* to 6 = *extremely relevant*. The subscale is designed to measure generalized moral intuitions rather than specific opinions or judgments. Therefore, the items in this subscale are formulated at a high level of abstraction and do not refer to current ideological debates. The questions in this subscale examine what people think about their own morality, making it a form of self-theory about how an individual believes

they make moral decisions. However, this type of self-report based on introspection has its limitations.

The second subscale – judgments about moral foundations – measures the extent to which participants agree with various statements. This subscale consists of 15 statements (e.g., "One of the worst things a person could do is hurt a defenseless animal" for care, or "I would call some acts wrong on the grounds that they are unnatural" for purity) rated on a scale from 1 = *strongly disagree* to 6 = *strongly agree*. While these statements do not explicitly reference moral judgment, the creators of the measure argue that the degree to which a person agrees with a given statement reflects the subjective importance of a particular moral foundation.

Authors also proposed the shorter version of the measure, with 20 items (same as in the long version), with 2 items per foundation (Graham et al., 2011).

#### 1.5.2.2. Moral Foundations Questionnaire-2

Although the Moral Foundations Questionnaire was tested across Western and Eastern cultures, it is not as culturally universal as the authors claim. It does not reflect certain (im)moral practices or rituals that are absent in the Western world. For instance, In India, among Brahmins, consuming meat or cutting one's hair during the 10-day mourning period after a father's death is considered immoral, as it violates purity traditions associated with "death pollution." The MFQ does not capture such nuances. Therefore, researchers saw the need to create a new measure that would be more culturally universal, including a greater number of moral foundations than in the original version of MFT.

The Moral Foundation Questionnaire-2 (MFQ-2; Atari et al., 2023) is a measure that consists of 36 items across six different foundations: care, equality, proportionality, loyalty, authority, and purity. Participants answer six items per foundation, indicating

how well each statement describes them on a scale from 1 = *does not describe me at all* to 5 = *describes me extremely well*. They were answering such statements as: “Caring for people who have suffered is an important virtue” for care, “The world would be a better place if everyone made the same amount of money” for equality, “I think people who are more hard-working should end up with more money” for proportionality, “I think children should be taught to be loyal to their country” for loyalty, “I think it is important for societies to cherish their traditional values” for authority, and “I think the human body should be treated like a temple, housing something sacred within” for purity.

#### 1.5.2.3. Moral Foundations Sacredness Scale

A slightly different measure, The Moral Foundations Sacredness Scale (MFSS; Graham & Haidt, 2012), was developed to measure how individuals view their commitments to certain moral values as absolute and inviolable. This means that such individuals would not be willing to violate the principles of these foundations, even for a large sum of money. For example, if someone sacralizes care, they would not accept harming animals.

The MFSS consists of 24 items, each assessing how sacred a person views each of the five moral foundations. Participants are asked to indicate the amount of money they would be willing to accept in exchange for performing actions that violate these foundations in various ways. The scale ranges from 1 = *I would do it for free* to 6 = *I would do it for one million dollars*. There is also an option to refuse to do the action for any amount of money (7), which represents the maximum degree of sacralization for a specific moral foundation. The instructions encourage participants “to imagine actually doing the following things, and indicate how much money someone would have to pay you (anonymously and secretly) to be willing to do each thing. For each action, assume that nothing bad would happen to you afterwards. Also assume that you cannot use the

money to make up for your action" (Graham & Haidt, 2012). The actions proposed in this measure are, for example, "Kick a dog in the head, hard" for care, "Say no to a friend's request to help him move into a new apartment, after he helped you move the month before" for fairness, "Leave the social group, club, or team that you most value" for loyalty, "Make a disrespectful hand gesture to your boss, teacher, or professor" for authority, or "Attend a performance art piece in which all participants (including you) have to act like animals for 30 minutes, including crawling around naked and urinating on stage" for purity.

The score can be calculated in two ways: by averaging the ratings on the scale or by counting the number of negative responses (never, for no amount of money) for each subscale.

#### 1.5.2.4. Moral Foundations Vignettes

Moral Foundations Vignettes (MFVs) is a measure designed to test moral foundations through short scenarios depicting various moral situations (Clifford et al., 2015). In contrast to the classical Moral Foundations Theory (MFT), which claims the existence of five basic moral foundations, MFVs include an additional sixth foundation – liberty/oppression. Additionally, within the care/harm foundation, three categories are distinguished: emotional and physical, with physical further divided into categories of human and animal.

The authors created a total number of 132 vignettes. Each vignette presents a situation in which a particular moral principle is violated or upheld, and participants in the study evaluate its moral acceptability on a scale from 1 = *not at all wrong* to 5 = *extremely wrong.* The example situations include: "You see a teenage girl openly staring at a disfigured woman as she walks past" for emotional care, "You see a teacher hitting a student's hand with a ruler for falling asleep in class" for physical care toward

human, “You see a boy throwing rocks at cows that are grazing in the local pasture” for physical care toward an animal, “You see a tenant bribing a landlord to be the first to get their apartment repainted” for fairness, “You see the US Ambassador joking in Great Britain about the stupidity of Americans” for loyalty, “You see an employee trying to undermine all of her boss’ ideas in front of others” for authority, and “You see a man in a bar using his phone to watch people having sex with animals” for purity/sanctity.

**1.5.2.5. Summary**

Moral Foundations Theory (MFT) has recently undergone some changes, including an increase in the number of moral foundations from five to six and a revision of the distinction between binding and individualizing foundations. These adjustments led to the creation of a new measure, an alternative to the classic Moral Foundations Questionnaire (MFQ), commonly used in moral foundations research – The Moral Foundations Questionnaire-2 (MFQ-2). The new measure also fits better for cross-cultural research. In addition to the widely used MFQ approach, there is also an approach focused on the sacralization of moral foundations with the Moral Foundations Sacredness Scale (MFSS). While based on the same theory, this approach differs in that participants not only agree or disagree with statements but also decide whether they would perform specific actions for a certain amount of money.

The MFVs also offer an alternative method for capturing moral foundations by using real-life scenarios and include an additional moral foundation – liberty. Unlike the MFQ, which directly asks about moral beliefs, the MFVs use real-life scenarios to indirectly assess moral intuitions. This measure helps to better understand how people react to specific moral situations, providing a more naturalistic approach to moral judgment capturing a wider range of intuitions compared to abstract statements, and adding another foundation of liberty.

In summary, within a single theory, we have several different ways to measure moral foundations – both in terms of assessing their importance for participants, agreement with certain statements that align with specific values, making decisions regarding actions related to sacralization, and through more naturalistic, scenario-based assessments like the MFV. As seen here and in previous discussions on philosophical theories adapted to psychological research, like utilitarianism, moral identity, and moral foundations, morality remains a complex and contested concept.

## 2. How Music Shapes Morality – A Review of Research

In this Chapter, I will present example studies analyzing the impact of music on morality. Using Paruzel-Czachura's definition of morality as a moral triad, I will not limit the discussion to utilitarianism, moral foundations, and moral identity alone. Instead, I aim to provide a comprehensive overview, presenting a broader perspective on how music interacts with some aspects of morality. This Chapter is based on a monograph chapter accepted for publication (Pypno-Blajda & Paruzel-Czachura, *in press*)

### 2.1. The Influence of Music on Moral Thinking

First, I will focus on one part of morality – moral thinking, including moral judgments, decisions, and intuitions. Not all the studies presented will show an effective manipulation; among those described, there will also be studies that indicate no impact of music on moral decisions. However, I also decided to include these cases because the lack of effect is just as important a message as evidence of a relationship between variables. This approach is particularly important in the context of the replication crisis in psychology (Mirowski, 2018), which I discuss in section 4.4. In the spirit of open science, publishing so-called null effects – i.e., studies that did not show significant results – plays a key role. This is important not only for saving the time of other researchers who might attempt to conduct similar studies in the future but also for developing scientific theory and practice. Information about the lack of a relationship between variables or the lack of influence of one on the other is just as valuable as evidence for their existence.

#### 2.1.1. Harmonious Deception

In a study conducted with 136 Belgian students (Stouten et al., 2011), participants watched a film about ancient Egypt under one of three conditions: no music, with tonal music (with harmonic relations around a specific tonic), and with atonal music (rejecting traditional tonality rules, lacking a fixed tonal center and sound hierarchy). The piece

played in the tonal music condition was the Allegro from Franz Schubert's "Sonata in A minor" D784, and in the atonal music condition, it was "The Adventures of Greggery Peccary: Movement III" by Frank Zappa. After watching the film, participants' honesty was tested by creating a situation where they could deceive another person. The experimenter informed the participants that they would share a reward with another unknown person. The reward was lottery tickets that gave a chance to win movie tickets. Participants received an envelope with seven lottery tickets, each worth two cinema tickets. They were told that the second person would not know the actual value of the tickets, which created an opportunity for deception. Participants then selected their tickets, leaving the remaining tickets for the second person in the envelope to be handed to the experimenter. In the tonal music condition, participants kept more tickets for themselves compared to the atonal music condition, indicating they were more likely to deceive. Moreover, the researchers explain that the reason for this difference lies in the emotions participants experienced under different conditions. Participants reported a significantly lower level of positive mood and a higher level of negative mood in the tonal music condition, while in the atonal music condition, they reported significantly higher levels of positive mood and lower levels of negative mood.

### 2.1.2. Sad but Honest

In a series of three experiments (Ziv et al., 2012), the moral acceptability of a radio advertisement featuring unethical behavior was assessed. In the first experiment, 62 Israeli students were shown an advertisement for a website promising higher pensions through fraudulent documents verifying work experience. One group listened to the advertisement without music, while the other group heard it with the Allegro from Wolfgang Amadeus Mozart's "Eine Kleine Nachtmusik" in the background. Analyses showed that music induced a positive affect, which led to poorer recall of the

advertisement's content and a less frequent judgment of deception as wrong. In the second experiment, 120 Israeli students listened to an advertisement for a website offering essay and student paper copying services, which was closer to their own life experiences. As in the first experiment, the groups either listened to the advertisement without music or with "I Feel Good" by James Brown. The results were similar to the first study – music generated a positive affect, which led to less frequent moral judgments of deception and poorer recall of the advertisement. The same advertisement from the second study was used in the third experiment but with different soundtracks. Two groups of participants (67 Israeli students) listened to the advertisement on copying student papers. One group heard sad music ("Adagio in G minor" by Tomaso Albinoni), while the other heard happy music (Allegro from "Eine Kleine Nachtmusik" by Mozart). Participants in the sad music group more frequently judged deception as wrong and remembered the advertisement better than participants from the happy music group. In conclusion, positive music (inducing a good mood) led to more lenient moral judgments, while sad music (inducing a negative mood) caused stricter judgments.

### 2.1.3. The Joy of Helping

In another series of experiments (Seidel & Prinz, 2013) conducted on American students (181 participants in total), two types of music were used. One was an unpleasant, noisy piece from the "noise" genre: "Inner Mind Mystique" by Japanese composer Masonna, intended to induce anger. The other was "Morning Mood" from the "Peer Gynt" suite by Edvard Grieg, aimed at inducing joy. Participants were assigned to one of three groups: one with unpleasant music, one with joyful music, and one with no music. They then evaluated the appropriateness of various situations, which differed by study. In the first study, situations involved a man finding a wallet on the street and keeping the money, falsifying his qualifications on a resume, and cutting in front of other cars to avoid

traffic. In the second study, situations involved people in need, such as a young mother struggling with a stroller at a train station or a poor, unemployed man asking for money for sustenance. Participants rated how appropriate it would be to help in such situations and how much they felt they should help. In the first study, participants who listened to noisy music judged the situations as inappropriate more frequently than participants in the other groups. In the second study, the effect was seen with both noisy and positive music – positive music made participants more likely to rate the need to help as higher and to feel a greater moral obligation to help, while unpleasant music made them less likely to perceive the situations as requiring help. In conclusion, unpleasant music made participants' moral judgments stricter but less likely to perceive the need for help, while joyful music made them more likely to see the need and obligation to help.

### 2.1.4. Aroused but Unchanged

In a study conducted in virtual reality (VR), moral decisions were analyzed in the classic trolley dilemma (Skulmowski et al., 2014), where participants (66 Dutch students) had to decide whether to sacrifice one person to save five others. The study also used stimulating, unpleasant "noise" music, specifically the same piece used in the previous study, "Inner Mind Mystique." The music, like in the previous study, induced unpleasant emotions, but participants reported more pleasure from participating in the study compared to the group that did not listen to music. Those listening to music were also more aroused, as confirmed by pupil dilation measurements. However, there were no differences in moral decision-making between the groups. In conclusion, while music influenced participants' affective and physiological states, it did not change their moral decisions.

### 2.1.5. "Be Brave" and Donate Money

This section discusses a broader range of studies, but the first experiment in the series is interesting in the context of music's influence on moral decisions (Strick et al., 2014). The study was conducted with 92 Dutch students who were presented with two advertisements, and their impact on emotions and willingness to donate money to the advertised organization was assessed. Participants were shown two different advertisements (positive and negative), each paired with two pieces of music – one highly rated as emotionally moving (the song "Down by the Riverside" for the positive advertisement and "The Funeral" for the negative advertisement), and one rated low as moving ("Always like this" for the positive advertisement and "Attack el Robot" for the negative advertisement). The positive advertisement was about the pharmaceutical company Pfizer and featured a teenager painting graffiti on walls, suggesting a criminal nature to his actions, but upon returning home, it was revealed that the graffiti contained a message "Be brave" for his ill younger sister lying in bed. The negative advertisement was for the non-profit organization Child Friendly, which promotes children's rights, showing children imitating adults' behaviors, such as smoking or violence. The advertisement ends with a scene where the children help a man lift a woman's groceries, and the campaign slogan is: "Make your influence positive." The increase in the willingness to donate was observed only in one case: the positive advertisement with moving music (which was also rated as more emotional, less annoying, and more beautiful).

### 2.1.6. Joyful Acceptance

In another experiment (Steffens, 2020), the moral evaluation of a situation presented in a film was tested under the influence of background music. The study involved 252 participants from the general population in Germany, divided into three

groups: those watching the film with no music, with positive music, or with negative music. The group with positive music listened to the pieces “Streets of London” from the film Oliver Twist, inducing joy, and “Dawn” from Pride and Prejudice, inducing feelings of calm and love. The group with negative music heard “Sore Spots” from Return of Batman, which generates tension, and “Persecution/Final” from Men of Galilee, inducing anger. Each participant watched two film clips: one from “A Simple Plan” (1998), in which three men find a bag of money and decide to keep it, and the other from “Amour” (2012), where a husband suffocates his wife with a pillow to ease her suffering after a stroke. The results showed that only in the condition with positive music, while watching the “A Simple Plan” clip, participants judged the characters’ behavior as more acceptable than those in the other groups. In conclusion, joyful music influenced the participants’ positive mood, which lowered the severity of their moral judgments regarding the behavior presented in the film.

### 2.1.7. More Honest Religious Participants?

The next two studies focus on the use of religious music. The first study (Lang et al., 2016) examined participants (a total of 254 individuals) from Mauritius (general population), the Czech Republic (students), and the United States (students), who were assigned to one of three groups: white noise, secular music, or religious music.

For participants from Mauritius, the religious song was a piece performed during collective rituals at a local temple, particularly during the annual Thaipusam Kavadi festival, while the secular song was the Bollywood piece Dhaai Akshar Prem Ke by Mera Mahi Bada Sohna Hai. For Czech participants, the religious music was Ave Maria by Johann Sebastian Bach/Charles Gounod, and the secular piece was Romance in F Minor by Pyotr Tchaikovsky. Among Americans, the religious piece was the chorale Jesus

bleibet meine Freude BWV 147 by Johann Sebastian Bach, and the secular piece was the cantata Wachet Auf BWV 140 by the same composer.

After listening to a randomly selected piece, participants solved 20 sets of math problems of increasing difficulty, which became nearly impossible to solve within the allotted time after the sixth set. Participants self-reported the number of correctly solved problems, which directly affected their financial compensation at the end of the experiment. The experimenter, however, did not check their answers, allowing participants the opportunity to cheat about the number of completed tasks to earn more money.

The results showed that participants from Mauritius in the religious music group reported solving fewer problems than those in other groups and countries. Additionally, in the overall sample, religious participants in the religious music condition reported solving fewer tasks, suggesting a lower level of dishonesty when attempting to increase financial gains from the study.

### 2.1.8. More Honest in Religious Organizations

The second study, which also used religious music, expanded on the previous experiment by adding new elements (Nichols et al., 2020). Students from Japan (157 individuals), the Czech Republic (128 individuals), and the United States (123 individuals) were assigned to one of four groups: no music, white noise, religious music, or secular music. Czech and American participants listened to the same pieces as in the previous study, while Japanese participants in the religious condition listened to Gagaku—the oldest orchestral music in the world, associated with Shinto religious rituals and imperial ceremonies. In the secular condition, they listened to a piece performed on the traditional Japanese instrument koto.

In this study, instead of solving math problems, participants had to indicate which side of a vertically split screen contained more dots. Every response stating that more dots were on the right side resulted in additional monetary compensation after the experiment, regardless of the actual number of dots, providing an opportunity to cheat for financial gain.

Unfortunately, this study did not confirm the results of the previous experiment, where religiosity reduced dishonesty among participants listening to religious music. This time, the key factor was religious group membership. In summary, individuals affiliated with religious organizations who listened to religious music exhibited greater honesty.

### 2.1.9. Irritation and the Severity of Moral Judgments

Another study was conducted on 96 English-speaking participants recruited through an external platform (Ansani et al., 2019), who received monetary compensation for their participation, and 68 Italian-speaking participants recruited via social media, who did not receive any compensation. During the online experiment, they listened to one of four musical pieces designed to evoke different emotions: “Sonata in D Major” K448 by Wolfgang Amadeus Mozart (happiness), “Do” by Nils Frahm (relaxation), “Nocturne in G Minor” Op. 37 No. 1 by Fryderyk Chopin (sadness), and “Étude No. 1” by György Ligeti (irritation). After listening to the music, participants responded to moral dilemmas, categorized as either high or low emotional engagement.

A high-emotional-engagement dilemma, for example, asked whether it would be appropriate to eat one’s deceased pet dog for dinner, whereas a low-emotional-engagement dilemma involved falsifying a résumé to obtain a job. Results indicated that music influenced moral judgments only in high-emotional-engagement dilemmas. Negative emotions (sadness and irritation) intensified moral severity, meaning that participants were more likely to judge the behavior as morally wrong. In contrast, positive

emotions (happiness and relaxation) mitigated moral judgments. The effect was stronger for emotions with high arousal (happiness and irritation), with irritation leading to the most severe moral judgments.

### 2.1.10. Joy and Reduced Sensitivity to Moral Norms

This series of experiments examined the influence of musical-induced emotions on moral decision-making among American students (Gawronski et al., 2018). In the first experiment, participants (a total of 249 individuals) were randomly assigned to two groups: one listened to the neutral piece "Common Tones in Simple Time" by John Adams, while the other listened to the joyful "Eine Kleine Nachtmusik" by Wolfgang Amadeus Mozart. Participants who listened to Mozart reported higher levels of happiness and lower sensitivity to moral norms, measured using the CNI model (sensitivity to consequences – parameter *C*, sensitivity to norms – parameter *N*, and preference for inaction – parameter *I*).

In two subsequent experiments, researchers explored the effects of negative affect (sadness and anger) induced by music. In both cases, the neutral condition involved listening to the same piece as before, while the sad music condition (243 participants) featured "East Hastings" by Godspeed You! Black Emperor and the anger-inducing condition (240 participants) used "Throat I" by Little Women, a free jazz piece characterized by dissonant sounds. Results showed that neither sadness nor anger influenced moral decision-making. In summary, happiness – but not anger or sadness – led to reduced sensitivity to moral norms.

### 2.1.11. High-Pitched Sounds and Healthy Choices

This study involved a series of five experiments (Huang & Labroo, 2020). However, the first experiment focused on behavior and will be discussed in the section on the influence of music on moral behavior. Here, I focus on experiments 2–5, which

examined moral decision-making, all conducted with American participants recruited through the MTurk platform.

In the second experiment, conducted online, 299 participants were assigned to one of three conditions: listening to an original rock song, the same song with electronically lowered pitch, or the same song with electronically raised pitch. They were asked to imagine sitting in a café and selecting a breakfast item while seeing the calorie content of each option. Results showed that participants who listened to the high-pitched version of the song ordered fewer calories than those in the other groups.

The third experiment, also conducted online, used three different music genres – rock (the same song as before), jazz, and metal – each manipulated with increased or decreased pitch. Participants (601 individuals) chose between four pairs of options involving a healthy and a less healthy choice (e.g., potato chips vs. apple chips, a movie ticket vs. a gym pass). By using additional music genres, researchers replicated the previous findings: participants exposed to high-pitched music were more likely to choose healthier alternatives.

The fourth experiment also examined decision-making. In this case, participants (201 individuals) listened to a classical piece with either electronically lowered or raised pitch and rated the likelihood of engaging in activities such as going to the gym, attending yoga/Pilates classes, or avoiding high-calorie foods rich in bad cholesterol and fats. As in previous studies, participants exposed to high-pitched music were more inclined toward healthy behaviors, but the effect was not statistically significant. Instead, moral self-perception played a key role. Additional analyses showed that listening to high-frequency music enhanced moral self-perception, which in turn increased the likelihood of making healthier choices.

In the fifth experiment, researchers introduced a moral priming task, where participants had to form a grammatically correct sentence from words such as “being, moral, important, is, am” (whereas the neutral condition used words like “this, blue, ball, is, be”). During the task, participants (401 individuals) listened to classical music with either a lowered or raised pitch and, as a reward, received a restaurant voucher for a healthy restaurant or an indulgent one. Results indicated that among those subjected to moral priming, there were no differences between groups, as priming increased the likelihood of choosing the healthy restaurant in the low-pitch condition (participants in the high-pitch condition already exhibited a higher preference for the healthy option in the absence of priming).

In summary, in most of the described experiments, high-pitched music influenced healthier choices related to diet and lifestyle.

### 2.1.12. Summary

The studies described in this section do not exhaust the topic of music’s influence on moral decision-making, but they serve as illustrative examples of different research approaches within this aspect of the moral triad. Other examples may include a much older study showing that students who listened to calm music were more likely to offer help compared to those who listened to unpleasant music (Fried & Berkowitz, 1979), a study in which music-induced chills did not affect participants’ declared willingness to engage in altruistic actions, such as donating blood (Konečni et al., 2007), or an experiment where individuals listening to different types of music displayed greater empathy in the Cyberball game compared to those who did not listen to music (Colverson et al., 2021).

From a slightly different perspective, the relationship between music and morality has been analyzed in research conducted on a group of Portuguese children participating

in a six-month educational program based on songs from Cape Verde (Neto et al., 2016). At the end of the program, a lower level of racial prejudice was observed, and this effect persisted even two years later. However, due to the small number of participants in the final measurement, these results should be interpreted cautiously.

In the context of biases toward specific ethnic groups, an interesting example comes from a study conducted in the UK (Vuoskoski et al., 2017), which found that individuals with higher empathy levels showed greater sympathy toward an ethnic group whose music they had been exposed to.

In summary, music can subtly shape moral decisions and prosocial attitudes. However, there is still much to uncover.

### 2.2. The Influence of Music on Moral Emotions

In this section, I present a study that, in addition to moral emotions, also addresses the topic of moral decision-making. However, I have chosen to discuss it here to highlight that research on music and morality is developing in all three directions of the moral triad. Although a single study is insufficient to draw definitive conclusions, it represents an important direction in which the field is evolving and may serve as an inspiration for future experiments. There may be more studies in this area, but I am aware of only one that directly addresses the topic of moral emotions.

This study (McDonald et al., 2022) examined whether emotionally negative music would influence the emotion of compassion. In addition to compassion, the researchers also measured empathy and decisions related to the willingness to help others. Participants were divided into two groups: one watched emotionally negative videos (a total of 48 twelve-second clips, such as a scene where a child's father commits suicide), while the other watched neutral videos (e.g., a scene where a person moves into a new apartment). The background music consisted of six selected sad pieces (e.g., "Adagio for

Strings" by Samuel Barber) or six neutral pieces (e.g., "Redacted" by Hans Zimmer), with each video being played with both sad and positive music.

After watching the clips, participants rated their mood, answered questions about empathy and compassion, and then watched a short video again, assessing their willingness to help the person depicted. The results indicated that emotionally negative (i.e., sad) music and portrayals of others' emotional suffering increased empathy and compassion. Participants were also more likely to decide to help another person.

### 2.3. The Influence of Music on Moral Behavior

Studying how people make moral decisions is crucial because such decisions directly influence actions shaping our daily lives. Will someone walking down the street with sad music in their headphones help me if I faint on the sidewalk? What kind of music should we play in a store to encourage healthier choices among customers? These questions are just a drop in the ocean of situations we encounter—situations that scientific research has already begun to answer.

#### 2.3.1. High Frequencies and Healthy Choices

The previous section described four out of five experiments investigating how high-frequency music influences moral decisions (Huang & Labroo, 2020). The first experiment conducted by the authors examined moral behavior. For the experiment, a small shop was set up on a university campus, offering two products for sale: an oatmeal raisin cookie (considered the healthier option) and a double chocolate cookie (considered the less healthy option). Background music was played while the shop was open (two hours per day). The authors did not specify the exact track used, but it was electronically modified into two versions—one with lower and one with higher frequencies. Over the course of the entire experiment, nine 30-minute sessions were conducted with high-pitched music and nine 30-minute sessions with low-pitched music. The results showed

that during sessions with high-pitched music, customers were more likely to choose the oatmeal raisin cookie, indicating a preference for the healthier option. This finding aligns with the results of the other experiments in the series conducted by these researchers.

However, as noted by the journal that published this article, the study is surrounded by controversy due to the lack of access to data, changes in the number of reported experiments (from eight to five), modifications in the number of participants and reported outcomes, and ultimately, the removal of the primary author from the original version of the article published in the *Journal of Marketing*. Thus, it is advisable to approach this series of studies with caution, treating them more as an inspiration for further research.

### 2.3.2. Energetic Helping

To understand how music might relate to a willingness to help others, a study was conducted in two university-managed gyms in the UK (North et al., 2004). While the gyms were open, two types of music were played: either lively, cheerful music designed to energize participants (30 different popular songs from UK charts) or irritating music (10 avant-garde pieces described as “computer music”). In both cases, music played for two hours.

The participants were regular gym users, unaware they were participating in an experiment. As they left the gym, they were presented with one of two scenarios: low engagement or high engagement. In the low-engagement scenario, participants were asked to sign a petition for a fictitious charity (British Disabled Athletes Association) supporting increased funding for sports access for people with disabilities. In the high-engagement condition, participants were asked to help distribute informational flyers about the same charity. They were requested to choose a date and the number of flyers they could distribute (ranging from 50 to 250).

The experiment was conducted over two days. On the first day, both gyms presented a low-engagement scenario, with one playing energetic music and the other playing irritating music. On the second day, both gyms presented the high-engagement scenario, but the music was switched—energetic music played in the first gym, while the second played irritating music. The results showed that participants who listened to familiar, lively music were in a better mood and more likely to dedicate their time and effort to flyer distribution. This suggests a link between energetic music and helping behavior.

### 2.3.3. I Feel Good, So I'll Harm Someone

A series of two laboratory experiments examined whether certain music could encourage participants to comply with a request that involved harming another person – specifically, conveying false, harmful information (Ziv, 2016).

In the first study, three different songs were used: one positive and well-known to participants in the English language ("I Feel Good" by James Brown), one positive and well-known in Spanish ("Suavemente" by Elvis Crespo), and one positive but unknown instrumental piece ("Pink Polyester" by Boston Horns). There was also a control group that did not listen to any music. Participants were informed that the study investigated the influence of music on cognitive processes, and their task was to underline all vowels in a poorly copied physics text within 90 seconds.

After completing the task, the experimenter (a man) asked participants for a favor – to call a female student who had come to campus specifically to participate in a study for the course credit and tell her she could not participate because the experimenter had left. The only justification was that the experimenter did not feel like meeting her. The results showed that participants who listened to music (the effect was observed only when all three experimental groups were analyzed together) were more likely to comply with

this request. No effect was found for emotions, but all songs were liked by participants, suggesting that liking, rather than emotions, influenced their decision to harm another person.

In the second experiment, the experimenter's gender was changed to female to rule out potential gender effects. The experimenter was introduced as a psychology student to minimize authority influence. There were two conditions this time: one without music and one in which the Spanish song from the previous study ("Suavemente") was played. The cognitive task remained the same. After completing it, the experimenter asked participants to call a student who had missed an entire semester due to illness and had come to campus specifically to collect notes. Participants were asked to tell her she could not retrieve them because the experimenter had not come to campus. The only justification was that she did not feel like handing them over. The results showed that those who listened to music were more likely to comply with this request, leading to harm toward the other person.

In summary, both experiments suggest that participants who listened to music were more willing to comply with a request that resulted in failing to help a person in need compared to those who did not listen to music.

### 2.3.4. Music and Cooperation

Another series of experiments examined the influence of music on group cooperation during decision-making (Kniffin et al., 2017). In the first study, two conditions were designed: happy music and non-happy music. In the happy music condition, four songs were played: "Yellow Submarine" by The Beatles, "Walking on Sunshine" by Katrina and the Waves, "Brown Eyed Girl" by Van Morrison, and the theme song from the *Happy Days* TV series. In the non-happy condition, lesser-known songs

such as “Smokahontas” by Attack Attack! and “You Ain’t No Family” by Iwrestledabearonce were used.

Participants received 10 tokens per round and could decide how many to contribute to a communal pool and how many to keep for themselves. Contributions to the pool were multiplied, meaning that the more everyone contributed, the greater the collective reward—this cooperative behavior was the focus of the study. Each group consisted of three people, and participants did not know their partners. Each session included 20 rounds, but the total number of rounds was kept secret to prevent strategic withholding of tokens near the end.

The results showed that participants who listened to happy music contributed more to the communal pool than those who listened to non-happy music. This led the researchers to conduct a second experiment with the same task, but they also controlled for participants’ moods this time. A control condition was also introduced in which participants did not listen to music. The results confirmed that those in the happy music condition contributed more to the communal pool compared to participants in the other two conditions.

In summary, the findings suggest that listening to happy music may promote greater cooperation within a group.

### 2.3.5. Summary

Similar to moral thinking, the above overview is not exhaustive but rather a selection of some examples within this aspect of the moral triad. Additional examples could include a study showing that older restaurant customers left higher tips when background music was playing (Beer & Greitemeyer, 2019), more aggressive and unpleasant feedback given to another person after listening to hardcore techno (Krahé &

Bieneck, 2012), or a three-week intervention in a primary school suggesting that exposure to calming music may reduce bullying (Ziv & Dolev, 2013).

## 3. Critical Analysis and Aims of the Present Research

### 3.1. Past Studies Critique

Some questions may arise regarding many of the studies discussed in the previous Chapter. For example, some studies are based on small sample sizes, such as the study by Seidel and Prinz with 66 participants (Seidel & Prinz, 2013) or the study by Strick and colleagues with 54 participants (Strick et al., 2014). Moreover, the samples were often unbalanced in terms of gender, as seen in the first study by Ziv, which included 24 men and 96 women (Ziv et al., 2012), or in the study by Kniffin and colleagues, which had 51 men and 27 women (Kniffin et al., 2017). Studies based on small and unbalanced samples may lead to neither sufficiently reliable nor representative results. In such cases, statistical power analysis is crucial in determining whether the selected sample size is adequate to detect real effects. If a study has low statistical power, the risk increases that its results will be random or insignificant, and actual relationships may remain undetected.

Additionally, in most studies, participants were exclusively students, which does not constitute a representative sample for drawing broader conclusions about the general population. Comparing the results of different studies is also challenging because each used a different measure, even when the research assumptions and topics were similar. For instance, both studies by Ziv employed self-created scenarios (Ziv, 2016; Ziv et al., 2012), while Gawronski and colleagues (Gawronski et al., 2018), as well as Skulmowski and colleagues (Skulmowski et al., 2014), used parametric tools to examine utilitarian orientation in various ways.

The diversity of research settings, such as field studies (e.g., in gyms; North et al., 2004), online studies (e.g., using film excerpts; Steffens, 2020), and laboratory studies (e.g., with virtual reality; Skulmowski et al., 2014), further complicates the situation. It is also essential to consider whether the research assumptions were accurately reflected in

the applied procedures. For example, can music used in a film be compared to background music? Can the mood induced by cheerful pop music with lyrics be compared to that of a cheerful classical piece? Was the choice of a healthy restaurant over an indulgent one truly a matter of making a healthy decision, or were other motivations involved?

Although we have some knowledge of music and morality, psychological research is still predominantly conducted using American samples or, more broadly, WEIRD samples (Western, Educated, Industrialized, Rich, Democratic) (Henrich et al., 2010b, 2010a). We now know that individuals from different countries make moral decisions differently (Bago et al., 2022) and have varying musical aesthetic preferences (Ping, 2022). Therefore, it is crucial not to limit research to a single sample. Expanding research beyond one culture allows us to capture the diversity of human experiences and avoid overgeneralizing findings. This is particularly important in cross-cultural studies, where unique social, historical, and cultural contexts shape moral and aesthetic judgments.

Only two of the discussed studies considered the cultural aspect, and even then, only in the context of religious music (Lang et al., 2016; Nichols et al., 2020). This is a significant limitation, given that different cultures have distinct musical traditions that may influence perception and emotional responses to music. Future research could explore this topic further, for example, by investigating how music with the same meaning for all participants is perceived across different cultures or by testing how music of one culture affects individuals from different cultural backgrounds.

In summary, while studies on the relationship between music and morality have already been conducted, the research presented here seems to be the beginning of exploring this topic. Future experiments must improve several elements, such as appropriate sample size, balanced gender representation, and consideration of variables that could potentially influence results, such as musical preferences, prior familiarity with

the piece, or song lyrics. In the context of open science, future research should strive for full transparency: sharing complete datasets, experimental materials, and statistical analysis codes. Such a step would enhance the credibility of the results, facilitate study replication, and enable further analyses. Additionally, it would be beneficial to use advanced parametric measures to reduce the risk of artifacts that could hinder the replication of results in future studies.

### 3.2. The State of Knowledge on Music and Utilitarianism, Moral Identity and Moral Foundations

While presenting some examples of how morality in terms of utilitarianism, moral identity, and moral foundations may change under various factors, I did not include music. Instead, I wanted to show that, indeed, these are the variables that may be manipulated in some way. Whereas there is not much but still a growing body of research on music on morality, it is quite modest in terms of the influence of music on utilitarianism, moral identity, and moral foundations.

Regarding utilitarianism, two studies explore how music may shape moral judgments within this framework: one by Skulmowski and colleagues (2014) and another by Gawronski and colleagues (2018), both discussed in section 2.1. Skulmowski's study used virtual reality to investigate moral decisions in a modified trolley dilemma. The modification was that participants could not refrain from action. They had to decide whether to turn left, killing one person, or turn right, killing five people. In other cases, they collapsed, and their results were not taken into account. While music was not the main focus, it was used in one condition to explore how irritation and frustration influenced moral choices. The music, indeed irritating ("Inner Mind Mystique" by Masonna), led to heightened arousal and negative (as well as positive!) emotional

responses but did not significantly affect moral decisions. However, most participants still chose the utilitarian option, saving more lives.

The other study investigating the influence of music on utilitarianism (Gawronski et al., 2018) used music as a stimulus to induce incidental emotions. The study focused on the impact of emotions on moral decisions (measured with the CNI model), with music being a key factor in eliciting those emotions. Across six experiments, they used Mozart's "Eine Kleine Nachtmusik" for joy, Godspeed You! Black Emperor's "East Hastings" for sadness, and Little Women's "Throat I" for anger. The manipulation was successful, with music evoking the desired emotions, influencing participants' sensitivity to norms, particularly in the joy condition with Mozart's music. This made participants more norm-oriented, which aligns with the classical understanding of deontology.

Regarding moral foundations, no study has directly examined the impact of music on moral values within this theoretical framework. However, one study (Steffens, 2020) mentions moral foundations, though not in direct relation to music. In that study, participants watched video clips with background music, rated their emotions, assessed the acceptability of the actions shown in the clips, and only at the end answered questions from the MFQ. The results revealed a negative linear relationship between the perceived rightness of an action and the care-based moral foundation. While none of the five moral foundations significantly correlated with emotions overall, care and purity did predict emotional responses. Greater reliance on care was linked to stronger feelings of fear, tension, reflectiveness, and sadness, while negatively correlated with relaxation and peacefulness. Similarly, a stronger emphasis on purity was associated with heightened aggression, anger, fear, and tension. In summary, while researchers identified some effects related to moral foundations, these were not directly linked to music itself but rather observed in a study where music was used as a background element.

As of March 2025, to the best of my knowledge, no study has directly or indirectly examined the influence of music on moral self-assessment. Furthermore, while I have reviewed research on the relationship between moral identity and various aspects (section 1.4.3.), most studies focused on how moral identity predicts behaviors or choices or how it is related to other variables. There is a gap in exploring how different factors may predict or influence our moral identity. Therefore, it is important to test this direction in order to challenge the view that moral identity is stable, as proposed in the trait-based perspective, and to explore how external factors, as suggested by the socio-cognitive perspective, may shape it.

## 4. Methods Employed in the Thesis

The choice of the most reliable way to explore the influence mentioned in the title of this thesis depends on the research perspective. From a scientific realism viewpoint, the best method is to conduct an experiment. In this chapter, I will outline the key aspects of designing the experimental studies presented in the empirical part.

### 4.1. Design

Most of the experiments in psychology may be conducted using either between or within-subjects designs (Jhangiani et al., 2019). Both have their pros and cons, and researchers need to choose what design better fits their study assumptions. In this section, besides the two most popular designs, I will also discuss mixed design, where the two may be implemented at the same time, which I will present in Study 2a.

#### 4.1.1. Between-Subjects Design

In a between-subjects experiment, each participant is assigned to only one group and experiences just one version of the study. To ensure accurate results, researchers must make sure the groups are similar in important ways, such as e.g., gender distribution. This helps prevent outside factors from affecting the findings. Keeping these factors balanced allows researchers to be more confident that any differences they observe are due to the experiment itself and not pre-existing differences between participants. One way to create balanced groups is through random assignment, where participants are placed into different conditions by chance. This method ensures that everyone has an equal and independent chance of being assigned to any group. While random assignment is simple when there are only two groups, it becomes more complicated with multiple groups. In such cases, block randomization can be useful. In this method, all conditions appear once in a sequence before any are repeated. For example, this approach was used in a study with three independent groups – one consuming alcohol, one believing they were

consuming alcohol (placebo), and a control group (Paruzel-Czachura, Pypno, Everett, et al., 2023).

A major advantage of the between-subjects design is that it avoids problems like practice effects or participants guessing the study's purpose. However, it also requires a larger number of participants, making it more resource-intensive. Additionally, natural differences between individuals can introduce variability in results, which researchers must carefully consider when designing their study.

### 4.1.2. Within-Subjects Design

In a within-subjects experiment, each participant takes part in all conditions instead of being assigned to just one. This approach is often used in psychology research because it allows participants to act as their own control, reducing the impact of individual differences.

This method was used, for instance, in a study on mindfulness, where participants' utilitarianism levels were measured before and after completing an eight-week mindfulness course, so during the pre-test and post-test (Paruzel-Czachura & Kocur, 2023). The main advantage of this design is that it increases statistical power and requires fewer participants since each person contributes data for all conditions. By reducing variability between groups, it becomes easier to detect real effects. However, there are also challenges. A major drawback is the risk of order or carryover effects, where the order of conditions or just experience of one condition influences responses in another. Additionally, participants might guess the study's purpose and change their behavior (Jhangiani et al., 2019).

Overall, while the within-subjects design offers strong statistical advantages and greater control over individual differences, researchers must carefully manage potential biases. As the authors of *the Research Methods in Psychology* handbook state: "A good

rule of thumb, then, is that if it is possible to conduct a within-subjects experiment (with proper counterbalancing) in the time that is available per participant – and you have no serious concerns about carryover effects – this design is probably the best option. If a within-subjects design would be difficult or impossible to carry out, then you should consider a between-subjects design instead" (Jhangiani et al., 2019, p. 123).

### 4.1.3. Mixed Design

A mixed design combines both between-subjects and within-subjects designs in one study. This approach allows researchers to manipulate some variables between different groups of participants (between-subjects) and other variables within the same participants (within-subjects). For example, in another study on alcohol consumption, a mixed design was used (Francis et al., 2019). On the one hand, the study compared four groups (experimental groups drinking a low or high dose of alcohol, placebo, and control) with each other (between subjects). On the other hand, affective empathy was measured both before alcohol consumption and at the end of the experiment. In this case, affective empathy was a within-subject variable, as each participant had their affective empathy measured at different times. The mixed design allowed the researchers to simultaneously compare the four experimental groups (between-subject) and examine the within-subject changes in affective empathy levels.

One advantage of a mixed design is that it combines the strengths of both between- and within-subjects designs. It helps reduce variability by controlling some variables within participants while still allowing comparison of different groups for other factors. However, mixed designs can be more complex to analyze and require careful planning to avoid potential issues, such as order effects from the within-subjects component.

### 4.2. Including Additional Covariates

Including covariates in experimental designs is important because it helps account for variables that might influence the study's outcome, ensuring that the effects observed are truly due to the experimental treatment and no other factors. Covariates are variables that are not the main focus of the study but could still affect the results. For example, in a study examining the impact of alcohol consumption, factors like participants' biological sex, prior experience with alcohol, and the time since their last meal could influence how they metabolize alcohol and respond during the experiment. By measuring and including these covariates in the analysis, researchers can adjust for their potential effects, leading to a clearer understanding of the treatment's true impact (Paruzel-Czachura, Pypno, Everett, et al., 2023).

However, it is crucial to select covariates thoughtfully. Including too many can complicate the analysis and potentially lead to misleading results, especially if some covariates are closely related to each other, which can lead to collinearity. Collinearity occurs when two or more covariates are highly correlated, making it difficult to determine their individual effects and potentially inflating standard errors, resulting in unreliable estimates. Therefore, researchers should carefully choose covariates that are relevant to the research question and ensure that their inclusion enhances the study's validity without introducing unnecessary complexity. This approach helps in making more accurate and reliable conclusions from experimental research.

### 4.3. Cross-Cultural Research

At the beginning of the 21st century, researchers began to emphasize the need to move beyond American samples in psychological studies. They pointed out that 95% of the world's population is often overlooked, given that Americans represent only 5% of the global population (Arnett, 2016). By conducting research exclusively on Americans,

we limit our understanding of the world, which is diverse in many ways, to just one perspective.

American researcher Henrich (Henrich et al., 2010b, 2010a) demonstrated through empirical studies that 96% of research focused on just 12% of the world's population and proposed the WEIRD classification. WEIRD stands for Western, Educated, Industrialized, Rich, and Democratic, describing populations that are often overrepresented in psychological research. These groups typically come from North America and Western Europe, and the findings from studies involving WEIRD samples may not be applicable to other, more diverse populations. Building on this, in 2018, another study showed that 80% of the studies published in *Psychological Science* were based on samples from WEIRD populations (Rad et al., 2018).

Whereas most studies from the previous century aimed to discover phenomena that are universal for all humankind, many of these findings have been questioned due to the over-reliance on WEIRD samples. For example, research on cognitive development by Jean Piaget, which has been foundational in psychology, was initially based on children from Western cultures, leading to the assumption that his stages of development were universal (Piaget, 2003). However, later studies in non-Western cultures showed that cognitive development might follow different trajectories depending on cultural upbringing and societal influences (see the review: Dasen, 2022). Similarly, theories of morality, such as Kohlberg's stages of moral development, initially suggested that moral reasoning progresses through universal stages, regardless of cultural background (Kohlberg, 1981b). However, research in diverse cultural contexts has challenged this view, showing that moral reasoning and ethical judgments can differ significantly across cultures (see the review: Gelfand et al., 2015).

In recent years, psychology has seen a growing trend toward large-scale, collaborative research projects known as *many lab studies*. These initiatives bring together researchers from different countries to work on a single project, ensuring that studies are conducted across diverse cultural and linguistic contexts. One well-known example is the Psychological Science Accelerator (PSA)**,** a global network of researchers who collaborate to translate studies and collect data in their respective countries. These collaborative efforts help improve the generalizability of psychological research by including participants from a wide range of backgrounds rather than relying solely on WEIRD populations.

### 4.4. Open Science Methods

The use of open science methods has grown in response to the replication crisis, which has been a major issue in psychology for over a decade. The replication crisis refers to the failure to reproduce many influential psychological studies in well-powered replications using the same methods. It stems from questionable research practices (QRPs), such as *p*-hacking (manipulating statistical analyses to obtain significant results), selective reporting of results, and, in extreme cases, data fabrication. It is also linked to methodological issues like small sample sizes and publication bias, which favors statistically significant findings over null results from studies implementing the very strict methodology, even though null effects also provide valuable insights into human behavior.

A turning point came after 2011, when cases of scientific fraud, such as Diederik Stapel's fabricated research, were exposed. Investigations revealed that Stapel had falsified data for 55 publications, though much of his original data was destroyed, meaning the number of false-positive findings may be even higher. This led researchers to question established psychological effects and test them using stricter replication

methods. Large-scale replication projects, such as the Open Science Collaboration (2015) and the Many Labs initiatives (Ebersole et al., 2016, 2020; Klein et al., 2014, 2018, 2022), produced concerning results. For example, Many Labs 1 successfully replicated 10 out of 13 studies, but Many Labs 2 replicated only 14 out of 28, Many Labs 3 only 3 out of 10, Many Labs 4 failed entirely (0 out of 1), and Many Labs 5 replicated just 2 out of 10 studies.

In response, psychology has introduced stricter standards, including preregistration, registered reports, and increased transparency in data sharing. Many journals now require statements about implementing open science practices (e.g., *Psychological Science*, *Journal of Applied Psychology*, *Nature Human Behaviour*). Others require all materials and data to be shared publicly (e.g., *Psychological Science, Personality and Social Psychology Bulletin, Scientific Data*). Other reward authors for open science practices with badges such as "Open Data," "Open Materials," and "Preregistered" (e.g., *Journal of Experimental Social Psychology, European Journal of Personality, Psychological Methods*).

While open science cannot completely eliminate unethical practices like *p*-hacking, it plays a vital role in promoting more rigorous research methods. Encouraging transparency in data sharing, preregistration, and replication efforts may help reduce biases and questionable research practices.

# III. EMPIRICAL PART

Building on the issues presented in previous sections, I conducted two experimental studies examining how music can influence one component of the moral triad – moral thinking. With these studies, I aimed to address some concerns regarding earlier studies raised in previous sections. The issues were, e.g., using reliable and accurate parametric measures, controlling for several covariates, and, most importantly, going beyond the WEIRD sample and applying open science practices.

In Study 1, I investigated how music that is likely to be perceived as similarly meaningful by all participants regardless of nationality (the national anthem) influenced decisions aligned with utilitarianism. In Study 2, I examined how a musical piece used in the Hollywood film *Pride & Prejudice* (originating distinctly from Western culture) affected the self-importance of moral identity and moral foundations.

In Study 1, I measured moral judgments using all three major approaches in modern psychology regarding the utilitarian framework: trolley dilemmas, OUS, and the CNI model. I opted for a between-subjects design to prevent participant fatigue from completing such a demanding survey. This design involved comparing two groups: an experimental group, where participants listened to their national anthem, and a control group that listened to the control piece. In Study 2, however, I employed mixed design. Each participant was tested twice (within-subject) to assess changes after listening to music, while a between-subjects approach was also used for cross-cultural comparisons.

In both studies, I controlled for covariates such as participants' music preferences, attentive music listening time, and musical education. In Study 1, I also accounted for political orientation, national identity, and national narcissism (collectively referred to as "national attachment"). In Study 2, I included empathy as an additional covariate. In Study 1, after listening to music, I tested six basic emotions plus pride, as the emotion

most felt after listening to the national anthem (Gilboa & Bodner, 2009); in Study 2, I tested positive and negative affects before and after listening to music.

I wanted to expand the studies beyond a WEIRD sample by conducting the study in two countries that are broadly representative of different cultural perspectives. I aimed to compare the most typical WEIRD country – the United States with a less WEIRD country from Eastern culture. The USA is frequently contrasted with China in discussions of morality (e.g., Farrington & Liu, 2023) and music (e.g., Ming, 2017), making these two countries particularly relevant for my investigation. They also differ in many other aspects, e.g., Power Distance (USA 40 vs. China 80), Individualism (USA 60 vs. China 43), Long Term Orientation (USA 50 vs. China 77), or Indulgence (USA 68 vs. China 24) (tested on a 100-point scale; Minkov & Kaasa, 2022). Therefore, I have chosen to conduct presented studies in the USA and China. While conducting Study 1, I cooperated with Yiming Liu, while conducting Study 2, with Chao Xue. These Chinese researchers helped me with the procedure translation and minor cultural adaptations. The measures were translated using the back-translation method.

Finally, all of my studies were preregistered (with a total of four preregistrations), and all datasets, statistical codes, and detailed procedures are publicly accessible on the Open Science Framework (OSF) repository.

## 5. Study 1

This Chapter is based on the manuscript during revision in the journal (Pypno-Blajda, Paruzel-Czachura, Gkinopoulos, et al., *manuscript under revision*).

### 5.1. Study 1: The Current Research

In Study 1, I tested a very specific piece of music that is similar in perception for participants from different countries, i.e., the national anthem and its influence on moral judgments consistent with utilitarian principles measured with trolley and footbridge

dilemmas, OUS and CNI model; so with three different approaches discussed broader in section 1.3.

The term “anthem” is not a specific music genre like “classical music” or “pop.” However, it refers to a broad category that includes many different musical styles. What all anthems have in common is their ability to inspire and bring people together through music (Liao et al., 2012). The national anthem, in particular, is a unique and powerful symbol of a country, offering a rich and meaningful experience.

Although some might argue that a national anthem is more of a political symbol than a form of musical manipulation, it clearly contains musical elements like melody, harmony, and rhythm. Therefore, including this type of music in my dissertation, which examines the influence of music on morality, is justified. While the anthem is a unique form of music, strongly tied to political meanings, its musical characteristics cannot be overlooked.

First, although national anthems are not physical objects like flags or emblems, they still represent national values through sound. Many songs, such as folk or military songs, can create national pride, but the national anthem is special because it is widely known and officially recognized as a national symbol. While different patriotic songs may have different meanings in different countries, the national anthem is usually the most important patriotic song.

Second, listening to a national anthem is usually a more interactive and social experience compared to looking at a flag or emblem (Liao et al., 2012). Because national anthems have such a strong emotional effect, it is important to study how they create a sense of connection to one’s country.

As music is strictly connected to emotions (Eerola, 2018; Eerola & Vuoskoski, 2013), after listening to music, I asked participants about six basic emotions (i.e., sadness,

happiness, fear, surprise, disgust, anger) and additional pride, as the most common emotion experienced when listening to the national anthem (Gilboa & Bodner, 2009). A particular form of pride, national pride, is frequently associated with a conservative political orientation (Kim & Lee, 2023). Moreover, the national anthem can influence citizens' sense of unity (Waterman, 2019), which can be conceptualized in two ways: one in which citizens identify with their nation (i.e., national identity; Miller, 1993), and another in which individuals perceive their country as superior to others, deserving of special treatment (i.e., collective narcissism; de Zavala et al., 2009). Taken together, collective narcissism, national identity, and conservative political orientation can be understood as components of national attachment. Stronger national attachment is linked to more pronounced reactions to national symbols and greater ideological alignment, thereby fostering a deeper sense of connection to one's nation (Gilboa & Bodner, 2009; van der Toorn et al., 2014). Such a strong emotional connection to national symbols can significantly influence moral perspectives and shape individuals' approaches to ethical dilemmas.

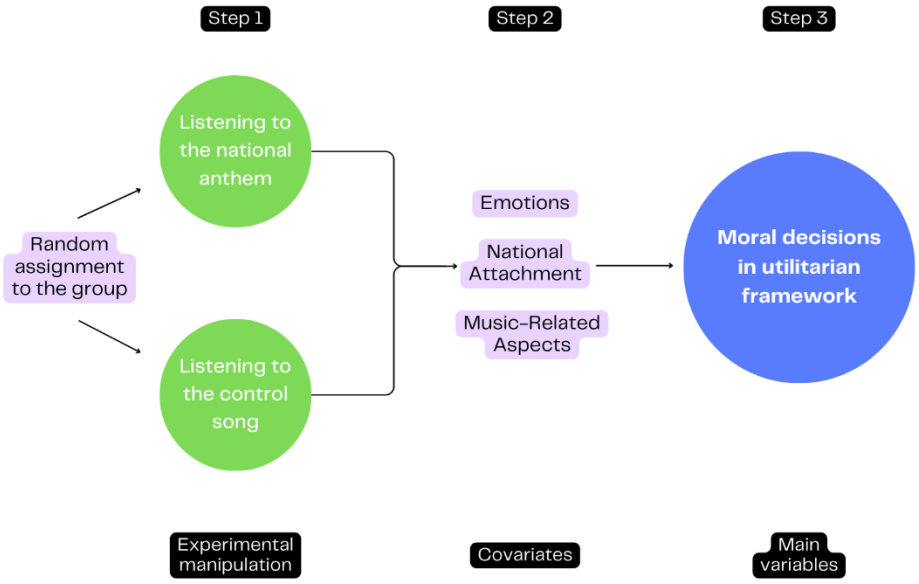
Additionally, I asked participants about their music preferences, the amount of time they spend every day listening attentively to music, their music education, and previous familiarity with the music. Preferences play a significant role in music perception, for instance, because they are considered a fundamental individual difference that predicts listening behaviors (Fricke et al., 2021) and can be linked with moral values (Preniqi et al., 2023) or antisocial behavior (Lozon & Bensimon, 2014). Musical education can also impact music perception, so participants with higher music education enjoy more musical genres than those without music education (Dobrota & Reic Ercegovac, 2014). This is also why I included the amount of time spent every day

attentively listening to music and previous familiarity with the presented music to test if it will influence music perception.

To conclude, I aimed to test whether listening to the national anthem would influence moral judgments consistent with utilitarian reasoning and whether variables connected to the national attachment can impact this influence. I also controlled felt emotions and music-related aspects (see Figure 2).

**Figure 2**

*The Graphic Representation of Study 1 Design*




According to previous studies, deontological choices are generally viewed as more favorable from a group perspective. Individuals who prefer deontological options are perceived as more moral (Everett et al., 2016) and trustworthy (Bostyn & Roets, 2017) compared to those making decisions connected with utilitarianism. They are also considered more desirable as long-term partners (Brown & Sacco, 2019). Furthermore, socially undesirable traits such as psychopathy may be associated with stronger preferences for utilitarian decisions, weaker sensitivity to social norms, and action-oriented when solving moral dilemmas (Paruzel-Czachura & Farny, 2024). Therefore,

a more deontological and less utilitarian orientation may be considered socially preferable.

Given that national attachment emphasizes group solidarity and social norms and that deontological choices align more closely with socially desirable traits, I predicted that listening to the national anthem would evoke the emotion of pride and strengthen national attachment and group identification. Consequently, I expected participants exposed to the anthem to make fewer judgments consistent with utilitarianism, reflecting an alignment with a socially favorable orientation consistent with deontology.

Specifically, I predicted that participants who listened to the national anthem would make more deontological-oriented choices in the trolley (H1) and footbridge dilemmas (H2) as well as in the traditional score of CNI (H3.4), be more sensitive to norms (H3.1), less sensitive to consequences (H3.2), and have lower levels of impartial beneficence (H4.1) and instrumental harm (H4.2) than participants who listen to control music. Also, I predicted that participants who listened to the national anthem would be more willing to take action (score lower in the *I* parameter of the CNI Model) than participants who would listen to control music (H3.3).

Moreover, I predicted that listening to the national anthem would substantially impact utilitarian-oriented moral judgments among participants with a higher level of national attachment (H5.1 – H.8.8). This is because national attachment – encompassing collective narcissism (de Zavala et al., 2009), national identity (Miller, 1993), and conservative political orientation on the conservative-liberal scale – is associated with stronger emotional responses to national symbols and a greater emphasis on social norms. This explains why individuals with higher national attachment might align more closely with socially desirable, deontological-oriented choices when exposed to the anthem.

The predictions, methods, and analysis plan were preregistered at the OSF repository (https://osf.io/e68bh). All study materials, data, and statistical analyses are also publicly available at the OSF repository (https://osf.io/f2kjz/). The study procedure was reviewed and approved by the Ethics Committee of the University of Silesia in Katowice (approval no. **KEUS 227/02.2022** for the study involving American participants and approval no. **KEUS 362/03.2023** for the study involving Chinese participants).

## 5.2. Study 1: Methods

### 5.2.1. The Pilot Study

Before starting the main study, I conducted a pilot study to select an appropriate piece of music for experimental and control conditions. For the control condition, I aimed to select a piece with the lowest emotional and familiarity ratings to create a neutral condition, as finding something as familiar but low in emotional impact as a national anthem was unlikely. This helped ensure that the music had minimal emotional influence and recognition. I avoided using white noise or silence, which could irritate participants (e.g., Masuda et al., 2018), which I wanted to prevent. I also wanted to test if there is a difference in emotional reaction after listening to the national anthem in the choir version with lyrics versus the instrumental version without lyrics.

#### 5.2.1.1. Participants and Procedure

Participants were recruited via the Prolific platform, $N$ = 33 in the USA ($n$ = 15 women, $M_{age}$ = 35.2; $SD_{age}$ = 14.1) and $N$ = 26 in China ($n$ = 14 women, $M_{age}$ = 32.9; $SD_{age}$ = 8.5). I used several pieces of music used in previous studies as control conditions: *Venus* by Gustav Holst, *Vogel als Prophet* by Schubert, *Divide* by Stephane De Lucia, and *De l'aube à midi sur la mer* from *La Mer* by Debussy. The same pieces were used in the pilot study in the USA and China. Participants rated the extent to which they felt each of the following emotions after listening to each piece (sadness, happiness, fear, disgust,

anger, pride) and how familiar they are with the music using 7-point rating scales ranging from 0 = *not at all* to 6 = *very much*. Participants saw the survey in their national language (American English or Mandarin Chinese).

#### 5.2.1.2. Results

The results were similar in both countries: the lowest results for emotions and familiarity was for "Divide" by Stephane De Lucia ($M_{emotions}$ = 0.8, $SD_{emotions}$ = 1.4; $M_{familiarity}$ = 0.2, $SD_{familiarity}$ = 0.4 in the USA; $M_{emotions}$ = 1.1, $SD_{emotions}$ = 1.6; $M_{familiarity}$ = 1.2, $SD_{familiarity}$ = 1.5 in China). I found no differences between the anthem with or without lyrics in every tested emotion and familiarity (see OSF). That could suggest that the anthem's power does not solely arise from its musical elements but from the meanings attributed to it, so the national anthem cannot be analyzed only as a musical piece, regardless of whether it is performed with or without lyrics. This is why I chose the most popular version of the anthem sung by the choir, the piece of music with lyrics.

### 5.2.2. The Main Study

#### 5.2.2.1. Participants and Procedure

Participants were recruited via the Prolific platform in the USA and the Synoint recruitment service in China. The sample size was estimated via G*Power software for *F* tests, ANOVA: Repeated measures, between factors with small effect size $f$ = .15 with 80% of power, with a margin of error of $\alpha$ = .05. According to this estimation, I gathered $N$ = 264 records for each country, $N$ = 264 in the USA ($n$ = 130 women) and $N$ = 264 in China ($n$ = 134 women), a total of $N$ = 528 ($n$ = 264 women). I preregistered the estimation of the sample for the repeated measure in the study with a between-subject design, which is discussed in the limitation section. However, I also conducted a sensitivity power analysis for ANOVA: Fixed effects, main effects, and interactions, with 80% of power,

with a margin of error of $\alpha = .05$, the total sample of $N = 528$, and get slightly bigger, but still small effect size $f = .18$.

Only individuals over 18 who provided informed consent were eligible to participate. I tested American and Chinese participants separately to ensure that each person listened to their own national anthem. Participants from each country listened to their national anthem only, not the anthem of the other country. All participants were exposed to the same control music, "Divide" by Stephane De Lucia. The music was embedded in the online survey via a YouTube link; however, participants did not see the video; they only saw the black screen. Link to the US national anthem: https://www.youtube.com/watch?v=FqxJ_iuBPCs; Chinese national anthem: https://www.youtube.com/watch?v=IeMFXiEq_ow; control music: https://www.youtube.com/watch?v=bHhtt7zP7GU&list=PLOVX251Le9ln5uD1MrOtdx11HXMZql-Ze). They listened to the music and then completed the survey in their native languages. They also gave their informed online consent to participate in the study. The average age of participants was $M = 42.0$ ($SD = 14.1$) in the USA and $M = 34.2$ ($SD = 9.0$) in China. Most of the participants were nonreligious ($N = 328$). However, the major religions in the USA were Catholicism ($n = 42$) and Buddhism in China ($n = 56$). Participants from the USA were slightly more liberal (on a 7-point liberal-conservative scale, $M = 3.0$, $SD = 2.0$), while participants from China were slightly more conservative (on a 7-point liberal-conservative scale, $M = 3.6$, $SD = 1.4$).

Before the main study tasks, participants were instructed to check their headphones and computer audio settings to ensure proper functioning. A brief sound test was conducted to verify audio clarity. Surveys were created on the LimeSurvey platform. Participants were randomly assigned to either the control or experimental condition by the LimeSurvey and were exposed to music. Following the song exposure, participants

filled out the online survey. First, they answered questions about emotions and previous familiarity with the song. Next, participants answered CNI, OUS, trolley, and footbridge dilemmas. In the end, there were questions about collective narcissism, national identity, political orientation in general, social and economic issues, sex, age, employment, type of religion practiced, practicing religion, musical education, favorite musical genre, and amount of time spent on attentive listening to music every day. To ensure participants remained focused during the survey, I employed attention checks. After listening to the music, participants were required to input three numbers said in their native language by the speaker during the song into a designated box. Counted as correct was writing down two out of three digits. To reinforce the musical stimulus, each participant encountered both songs three times: once at the beginning of the survey and twice more during the survey as a brief reminder (one minute). One reminder was in the middle of the CNI measure, and the other was after finishing CNI. Each time, participants needed to write down different three-digit number. Secondly, I used a type of attention check modeled on the CNI model dilemma but with specific instructions to choose either *yes* or *no* as the answer. These attention checks were numbered *7* and *8* in the CNI. Participants who did not answer two attention check questions correctly ($n$ = 12 in the USA and $n$ = 62 in China) were excluded from the final analyses. The average time to complete the survey was 30 minutes.

#### 5.2.2.2. Measures

**Emotions and Familiarity.** Participants were asked to describe emotions (sadness, happiness, fear, surprise, disgust, anger, pride) and previous familiarity with the song using a 7-point rating scale ranging from 0 = *not at all* to 6 = *very much*.

**Sacrificial Dilemmas**. Participants were presented with the trolley dilemma (Foot, 1967; in Chinese translation by Bago et al., 2022) and the footbridge dilemma

(Thomson, 1976; in Chinese translation by Bago et al., 2022) and asked to indicate whether they would perform the described action. The trolley dilemma sounded as follows: “There is a runaway trolley barreling down the railway tracks. Ahead, on the tracks, five people are tied up and unable to move. The trolley is headed straight for them. You are standing some distance off in the train yard, next to a lever. If you pull this lever, the trolley will switch to a different set of tracks. However, you notice that there is one person on the sidetrack. What do you do?”. Participants then answered on a 7-point scale from 1 = *I definitely do nothing* to 7 = *I definitely pull the level*. The footbridge dilemma sounded slightly different: “As before, a trolley is hurtling down a track towards five people. You are on a bridge under which it will pass, and you can stop it by putting something weighty in front of it. As it happens, there is a very fat man next to you – your only way to stop the trolley is to push him over the bridge and onto the track, killing him to save five. What do you do?”. Participants answered on a 7-point scale from 1 = *I definitely do nothing* to 7 = *I definitely push the man onto the track.*

**Sensitivity to Consequences, Norms, and Inaction Tendency**. Participants were asked to respond to a validated battery of 24 moral CNI dilemmas with action-oriented endings (Gawronski et al., 2017; in Chinese translation by Li et al., 2020). The battery included four variants of 6 fundamental dilemmas, varying as a function of (1) whether the benefits of the described action are greater or smaller than the costs and (2) whether the described action is prohibited or prescribed by a moral norm. Participants were asked if they would perform the described action in this case. Responses were measured with dichotomous *yes* vs. *no* response options. Using the CNI template files provided by Körner et al. (2020), the total numbers of *yes* vs. *no* responses on each type of dilemma were used to estimate three scores for each participant via multinomial modeling (Hütter & Klauer, 2016): a score reflecting sensitivity to consequences (*C* parameter); a score

reflecting sensitivity to moral norms (*N* parameter); and a score reflecting general preference for inaction versus action (*I* parameter). Parameter estimations were conducted with the freeware multiTree (Moshagen, 2010), using random start values, two replications, and a maximum of 90,000 iterations. Moreover, I followed the previous studies (Körner et al., 2020) and counted the *yes* answers from only one type of dilemma, in which a moral norm prohibits the described action but produces greater benefits than costs: the traditional way of thinking about utilitarianism, hereafter called *traditional score*. The reliability of the CNI questionnaire was poor (ω = .45 for Chinese participants; ω = .01 for American participants; ω = .25 for the whole sample; Hayes & Coutts, 2020).

**Instrumental Harm and Impartial Beneficence**. Dimensions of utilitarian-oriented decisions were measured using the OUS (Kahane et al., 2018; in Chinese translation by Bago et al., 2022). The impartial beneficence subscale includes five items measuring the extent to which people endorse the utilitarian demand for impartial helping (e.g., "It is morally wrong to keep money that one does not really need if one can donate it to causes that provide effective help to those who will benefit a great deal"). Instrumental harm subscale includes four items measuring willingness to cause harm to achieve positive consequences for the greater good (e.g., "It is morally right to harm an innocent person if harming them is a necessary means to helping several other innocent people"). Participants were asked to indicate how much they agreed with each statement, using a 7-point rating scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. The reliability of the OUS questionnaire was good (for the impartial beneficence subscale: ω = .77 for Chinese participants; ω = .80 for American participants; ω = .79 for the whole sample; for the instrumental harm subscale: ω = .79 for Chinese participants; ω = .73 for American participants; ω = .74 for the whole sample).

**Individual Differences.** I used three scales to study individual differences: The Collective Narcissism Scale (CNS; de Zavala et al., 2009; 3 items after Van Bavel et al., 2022), the National Identity Scale (NIS; Huddy & Khatib, 2007; 2 items after Van Bavel et al., 2022), and the political orientation (3 items after Luke & Gawronski, 2021). Chinese translations were made by my team. Participants were asked to rate how much they agree with three statements on a scale from 0 = *strongly disagree* to 10 = *strongly agree*; on three items in CNS, e.g., (1) "Americans/Chinese deserve special treatment," and two items in NIS, e.g., (1) "I identify as American/Chinese." Political orientation was assessed via three questions, e.g., (1) "How do you consider yourself politically in general?". Participants rated the answers on a 7-point scale ranging from 1 = *very liberal* to 7 = *very conservative.* The final outcome was the sum of the items in each scale.

**Music-Related Aspects.** I used three sets of items about music practices: degree of musical education (from The Ollen Musical Sophistication Index, OMSI; Zhang & Schubert, 2019), the amount of time spent listening to music every day (hereafter called *listening to music*; from The Goldsmiths Musical Sophistication Index, Gold-MSI; Lima et al., 2020), and the preference for specific music genres (five-factor MUSIC model after Rentfrow et al., 2011). Chinese translations were made by my team. In the OMSI, participants were asked to choose which title best described them from (1) "Non-musician" to (6) "Professional musician." In Gold-MSI, participants indicated the amount of time spent every day on attentive listening to music, from (1) "0-15 min" to (7) "4 hours or more". MUSIC model consisted of 5 questions in which participants indicated how much they like music genres, e.g., (1) "Smooth and relaxing styles (soul, soft rock, etc.)," on a 7-point scale ranging from 0 = *not at all* to 6 = *very much*.

**Socio-Demographics**. Participants were also asked about their socio-demographics: sex, age, employment, type of religion practiced, and the degree of practicing religion on a scale from 0 = *I do not practice at all* to 7 = *I practice regularly*.

### 5.3. Study 1: Results

All statistical analyses were conducted using R and RStudio software. Model fit for the CNI was conducted using MultiTree software (Moshagen, 2010).

#### 5.3.1. Manipulation Check

I tested the effectiveness of the experimental manipulation by asking participants about the emotions they experienced after listening to a song and their level of familiarity with it (see descriptive in Table 1).

**Table 1**

*Study 1: Descriptive Statistics of Manipulation Check*

| | Control | | Experimental | |
|---|---|---|---|---|
| | USA | China | USA | China |
| | *M (SD)* | *M (SD)* | *M (SD)* | *M (SD)* |
| Anger | 0.0 (0.2) | 0.9 (1.3) | 0.4 (1.1) | 1.5 (1.8) |
| Happiness | 3.6 (1.5) | 2.7 (1.8) | 2.5 (2.0) | 3.8 (1.9) |
| Sadness | 0.1 (0.3) | 1.0 (1.2) | 0.7 (1.3) | 1.6 (1.8) |
| Disgust | 0.1 (0.7) | 1.0 (1.5) | 0.6 (1.4) | 0.4 (1.0) |
| Surprise | 0.1 (0.3) | 2.4 (1.9) | 0.4 (0.8) | 3.2 (2.1) |
| Fear | 0.0 (0.1) | 0.9 (1.3) | 0.1 (0.5) | 0.6 (1.1) |
| Pride | 1.0 (1.5) | 2.0 (1.8) | 2.8 (2.3) | 5.1 (1.5) |
| Familiarity | 0.5 (1.1) | 2.0 (1.7) | 5.6 (1.0) | 5.8 (0.7) |

*Note*. Across all measures, the range of answers was min = 0 and max = 6.

I then conducted Linear Mixed Models (LMM) with emotion as a fixed factor and emotion ratings as the dependent variable, while country (USA/China) and group (control/experimental) were included as additional fixed factors (Table 2). The model was specified as follows: value ~ country * group * emotion + (1|id). Pride served as the

baseline emotion, with all other emotions compared to it in terms of their effect on emotion ratings. The analysis was performed using the dataset in a long format. Afterward, I applied a Benjamini-Hochberg *p*-value correction to control for false discovery rates, given the multiple comparisons involved. Throughout the thesis, I will report both the raw *p*-value and the *p*-value adjusted using the Benjamini-Hochberg correction.

**Table 2**

*Study 1: Results of the Linear Mixed Model Analysis for Emotions*

| | Estimate | Standard Error | 95% CI | *p*-value | Adjusted *p*-value |
|---|---|---|---|---|---|
| Country | -0.34 | 0.39 | [-1.11, 0.42] | .382 | .465 |
| Group | 0.53 | 0.39 | [-0.23, 1.29] | .176 | .235 |
| Anger | -0.58 | 0.79 | [-2.12, 0.96] | .462 | .531 |
| Disgust | -1.89 | 0.79 | [-3.44, -0.35] | **.017** | **.031** |
| Fear | -1.09 | 0.79 | [-2.63, 0.46] | .169 | .235 |
| Happiness | 8.19 | 0.79 | [6.65, 9.73] | **< .001** | **< .001** |
| Sadness | -1.07 | 0.79 | [-2.61, 0.47] | .176 | .235 |
| Surprise | -1.80 | 0.79 | [-3.35, -0.26] | **.022** | **.039** |
| Country * Group | 1.28 | 0.25 | [0.80, 1.76] | **< .001** | **< .001** |
| Country * Anger | 1.02 | 0.50 | [0.04, 1.99] | **.043** | .066 |
| Country * Disgust | 2.34 | 0.50 | [1.36, 3.32] | **< .001** | **< .001** |
| Country * Fear | 1.75 | 0.50 | [0.77, 2.73] | **< .001** | **.001** |
| Country * Happiness | -2.73 | 0.50 | [-3.71, -1.76] | **< .001** | **< .001** |
| Country * Sadness | 1.25 | 0.50 | [0.27, 2.23] | **.013** | **.025** |
| Country * Surprise | 2.27 | 0.50 | [1.29, 3.25] | **< .001** | **< .001** |
| Group * Anger | -0.34 | 0.50 | [-1.32, 0.63] | .493 | .531 |
| Group * Disgust | 1.06 | 0.50 | [0.08, 2.03] | **.034** | .057 |
| Group * Fear | 0.10 | 0.50 | [-0.87, 1.08] | .838 | .838 |

| | Estimate | Standard Error | 95% CI | *p*-value | Adjusted *p*-value |
|---|---|---|---|---|---|
| Group * Happiness | -3.82 | 0.50 | [-4.80, -2.85] | **< .001** | **< .001** |
| Group * Sadness | 0.15 | 0.50 | [-0.83,1.13] | .762 | .791 |
| Group * Surprise | -0.57 | 0.50 | [-1.54, 0.41] | .257 | .327 |
| Country * Group * Anger | -1.09 | 0.32 | [-1.71, -0.47] | **.001** | **.001** |
| Country * Group * Disgust | -2.39 | 0.32 | [-3.01, -1.77] | **< .001** | **< .001** |
| Country * Group * Fear | -1.78 | 0.32 | [-2.40, -1.16] | **< .001** | **< .001** |
| Country * Group * Happiness | 0.92 | 0.32 | [0.30, 1.53] | **.004** | **.009** |
| Country * Group * Sadness | -1.30 | 0.32 | [-1.91, -0.68] | **< .001** | **< .001** |
| Country * Group * Surprise | -0.88 | 0.32 | [-1.49, -0.26] | **.006** | **.012** |

Pride was no different between groups and between countries. However, the interaction between the country and the group was significant, suggesting that, in the experimental groups, American participants rated emotions significantly higher than Chinese participants.

Regarding other emotions, happiness had a positive effect on emotion ratings, while disgust and surprise had a negative effect. This means that, compared to pride, happiness was rated much higher, whereas disgust and surprise were rated lower.

The interaction between country and emotions of disgust, fear, sadness, and surprise showed that these emotions had a stronger effect on Chinese participants than on American participants. For happiness, the effect was reversed, with American participants showing a much stronger reaction to happiness than Chinese participants. When looking at the interaction between the group and happiness, the control group rated happiness significantly lower than the experimental group.

Regarding three-way interactions, the effect of anger, disgust, fear, sadness, and surprise was lower in the USA in the experimental group, meaning that these emotions were rated less intensely compared to Chinese participants in the experimental group. The

interaction between country, group, and happiness showed that American participants in the experimental group rated happiness higher than Chinese participants in the experimental condition.

Regarding familiarity, I conducted a two-way ANOVA with country and group as fixed factors. The dataset was in a wide format. The results showed differences between the groups ($F(1, 524) = 1962.7$, adjusted $p < .001$) with a large effect size ($\eta^2_p = .789$) and between the countries ($F(1, 524) = 80.6$, adjusted $p < .001$) with a large effect size ($\eta^2_p = .121$). The interaction between country and group was also significant ($F(1, 524) = 39.0$, adjusted $p < .001$) with a small effect size ($\eta^2_p = .069$). Given that the distribution was not normal, I also performed a non-parametric Kruskal-Wallis test with country and group as factors. The results for both group and country comparisons remained significant, even after applying the Be'njamini-Hochberg *p*-value correction (see OSF).

### 5.3.2. Main Analyses

Then, I conducted two-way ANOVA analyses with the utilitarian measure as the dependent variable and country and group as fixed factors (Table 3). However, since none of the distributions met the assumption of normality (which was assessed using the Shapiro-Wilk test), I then conducted Kruskal-Wallis tests with the utilitarian measure as the dependent variable and country and group as factors. Every significant result stayed significant (see OSF). I decided to present the two-way ANOVA results, as it is the only method that allows for testing interactions, which the Kruskal-Wallis test does not.

**Table 3**

*Study 1: Descriptive Statistics and Two-Way ANOVA Analyses of the Main Variables*

| | Control *M (SD)* | Experimental *M (SD)* | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|---|---|
| **Trolley[a]:** | | | | | | | | |
| USA | 5.3 (1.9) | 4.8 (2.1) | | | | | | |
| China | 4.0 (2.0) | 3.8 (2.0) | | | | | | |
| Country | | | 1 | 171.76 | 42.52 | **< .001** | **< .001** | .075 |
| Group | | | 1 | 13.86 | 3.43 | .065 | .152 | .007 |
| Country * Group | | | 1 | 2.49 | 0.62 | .433 | .615 | .001 |
| **Footbridge[a]:** | | | | | | | | |
| USA | 3.1 (2.2) | 3.0 (2.1) | | | | | | |
| China | 2.7 (1.8) | 2.5 (1.6) | | | | | | |
| Country | | | 1 | 24.79 | 6.55 | **.010** | **.042** | .012 |
| Group | | | 1 | 3.89 | 1.03 | .311 | .533 | .002 |
| Country * Group | | | 1 | 0.72 | 0.19 | .663 | .799 | .000 |
| **OUS IB[a]:** | | | | | | | | |
| USA | 3.7 (1.4) | 3.6 (1.4) | | | | | | |
| China | 3.3 (1.3) | 3.1 (1.4) | | | | | | |
| Country | | | 1 | 25.35 | 13.79 | **< .001** | **.001** | .026 |
| Group | | | 1 | 1.12 | 0.61 | .436 | .615 | .001 |
| Country * Group | | | 1 | 0.13 | 0.07 | .787 | .821 | .000 |
| **OUS IH[a]:** | | | | | | | | |
| USA | 3.1 (1.3) | 2.9 (1.3) | | | | | | |
| China | 3.5 (1.4) | 3.0 (1.4) | | | | | | |
| Country | | | 1 | 6.88 | 3.81 | .056 | .152 | .007 |
| Group | | | 1 | 11.13 | 6.17 | **.013** | **.046** | .012 |
| Country * Group | | | 1 | 3.06 | 1.70 | .193 | .387 | .003 |
| ***C* parameter[a]:** | | | | | | | | |
| USA | 0.3 (0.2) | 0.2 (0.2) | | | | | | |
| China | 0.2 (0.2) | 0.2 (0.2) | | | | | | |
| Country | | | 1 | 0.71 | 21.17 | **< .001** | **< .001** | .039 |
| Group | | | 1 | 0.11 | 3.31 | .069 | .152 | .006 |
| Country * Group | | | 1 | 0.00 | 0.13 | .718 | .799 | .000 |
| ***N* parameter[b]:** | | | | | | | | |
| USA | 0.4 (0.3) | 0.4 (0.3) | | | | | | |
| China | 0.5 (0.3) | 0.5 (0.3) | | | | | | |
| Country | | | 1 | 0.13 | 1.47 | .231 | .426 | .003 |

| | Control | Experimental | | Mean | | | Adjusted | |
|---|---|---|---|---|---|---|---|---|
| | *M (SD)* | *M (SD)* | *df* | Square | *F* | *p*-value | *p*-value | $\eta^2_p$ |
| Group | | | 1 | 0.06 | 0.72 | .398 | .615 | .001 |
| Country * Group | | | 1 | 0.01 | 0.12 | .733 | .799 | .000 |
| ***I* parameter[b]:** | | | | | | | | |
| USA | 0.6 (0.3) | 0.6 (0.3) | | | | | | |
| China | 0.2 (0.3) | 0.2 (0.3) | | | | | | |
| Country | | | 1 | 19.18 | 226.58 | **< .001** | **< .001** | .302 |
| Group | | | 1 | 0.02 | 0.27 | .606 | .799 | .001 |
| Country * Group | | | 1 | 0.00 | 0.03 | .857 | .857 | .000 |
| **Traditional Score[c]:** | | | | | | | | |
| USA | 2.8 (1.4) | 2.5 (1.3) | | | | | | |
| China | 3.6 (1.6) | 3.5 (1.6) | | | | | | |
| Country | | | 1 | 109.68 | 48.61 | **< .001** | **< .001** | .084 |
| Group | | | 1 | 7.50 | 3.32 | .069 | .152 | .006 |
| Country * Group | | | 1 | 0.30 | 0.13 | .717 | .799 | .000 |

*Note. C* parameter – sensitivity to consequences, *N* parameter – sensitivity to norms, *I* parameter – tendency toward inaction, IB – impartial beneficence, IH – instrumental harm.

[a] Range of answers: min = 1, max = 7. [b] Range of answers: min = 0, max = 1. [c] Range of answers: min = 0, max = 6.

I observed differences between the experimental and control groups in the instrumental harm, which means that after listening to the national anthem, participants were less likely to choose the option, resulting in harm to anyone for the greater good. American participants differed from Chinese participants in most moral judgment measures. Specifically, Americans made more utilitarian choices than Chinese in the trolley dilemma, impartial beneficence, and the *C* parameter, while Chinese were more utilitarian than Americans in the traditional score from CNI and were more action-oriented in the *I* parameter. Regarding the CNI model, the model fit for country comparison was $G^2(2) = 12.98$, $p < .001$; for group comparison was $G^2(2) = 21.63$,

$p < .001$, which means that the CNI model does not fit the data well for either the country or group comparisons, and should not be further interpreted.

### 5.3.3. National Attachment Covariates

There was no strong collinearity between collective narcissism, national identity, political orientation, and emotion of pride (Table 4), so I conducted ANCOVA analyses with the country and group as fixed factors and the above variables as covariates (Table 5).

**Table 4**

*Study 1: Correlations Between National Attachment Covariates*

| | 1. | 2. | 3. | 4. |
|---|---|---|---|---|
| 1. Collective Narcissism | - | | | |
| 2. National Identity | .54 | - | | |
| 3. Political Orientation | .44 | .35 | - | |
| 4. Pride | .40 | .40 | .23 | - |

**Table 5**

*Study 1: ANCOVA Analyses With National Attachment Covariates*

| | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|
| **Trolley:** | | | | | | |
| Country | 1 | 172.73 | 44.07 | **< .001** | **< .001** | .095 |
| Group | 1 | 13.86 | 3.54 | .061 | .148 | .021 |
| Pride | 1 | 59.16 | 15.09 | **< .001** | **.001** | .016 |
| Collective Narcissism | 1 | 20.19 | 5.15 | **.024** | .063 | .001 |
| National Identity | 1 | 1.47 | 0.38 | .540 | .687 | .001 |
| Political Orientation | 1 | 0.02 | 0.00 | .950 | .950 | .000 |
| Country * Group | 1 | 0.42 | 0.11 | .743 | .849 | .000 |
| **Footbridge:** | | | | | | |
| Country | 1 | 25.05 | 6.80 | **.009** | **.031** | .028 |
| Group | 1 | 3.89 | 1.06 | .305 | .461 | .007 |
| Pride | 1 | 26.46 | 7.18 | **.008** | **.028** | .008 |

| | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|
| Collective Narcissism | 1 | 30.32 | 8.23 | **.004** | **.019** | .019 |
| National Identity | 1 | 7.52 | 2.04 | .154 | .278 | .003 |
| Political Orientation | 1 | 1.55 | 0.42 | .517 | .674 | .001 |
| Country * Group | 1 | 1.71 | 0.46 | .497 | .662 | .001 |
| **OUS IB:** | | | | | | |
| Country | 1 | 25.48 | 14.72 | **< .001** | **.001** | .039 |
| Group | 1 | 1.12 | 0.65 | .422 | .576 | .021 |
| Pride | 1 | 39.87 | 23.03 | **< .001** | **< .001** | .045 |
| Collective Narcissism | 1 | 1.75 | 1.01 | .315 | .465 | .009 |
| National Identity | 1 | 14.67 | 8.47 | **.004** | **.019** | .013 |
| Political Orientation | 1 | 4.55 | 2.63 | .106 | .219 | .005 |
| Country * Group | 1 | 2.13 | 1.23 | .268 | .429 | .002 |
| **OUS IH:** | | | | | | |
| Country | 1 | 6.65 | 3.94 | **.048** | .121 | .000 |
| Group | 1 | 11.13 | 6.60 | **.010** | **.032** | .020 |
| Pride | 1 | 11.49 | 6.81 | **.009** | **.031** | .011 |
| Collective Narcissism | 1 | 26.83 | 15.91 | **< .001** | **< .001** | .041 |
| National Identity | 1 | 30.00 | 17.79 | **< .001** | **< .001** | .033 |
| Political Orientation | 1 | 0.01 | 0.01 | .930 | .950 | .000 |
| Country * Group | 1 | 4.31 | 2.56 | .110 | .221 | .005 |
| ***C* parameter:** | | | | | | |
| Country | 1 | 0.71 | 21.57 | **< .001** | **< .001** | .016 |
| Group | 1 | 0.11 | 3.34 | .068 | .148 | .008 |
| Pride | 1 | 0.00 | 0.12 | .735 | .849 | .002 |
| Collective Narcissism | 1 | 0.26 | 7.76 | **.006** | **.022** | .010 |
| National Identity | 1 | 0.01 | 0.24 | .623 | .759 | .001 |
| Political Orientation | 1 | 0.04 | 1.27 | .261 | .429 | .002 |
| Country * Group | 1 | 0.00 | 0.01 | .938 | .950 | .000 |
| ***N* parameter:** | | | | | | |
| Country | 1 | 0.13 | 1.46 | .228 | .387 | .007 |
| Group | 1 | 0.06 | 0.73 | .395 | .564 | .000 |
| Pride | 1 | 0.10 | 1.08 | .300 | .462 | .000 |
| Collective Narcissism | 1 | 0.56 | 6.23 | **.013** | **.038** | .014 |

| | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|
| National Identity | 1 | 0.28 | 3.11 | .078 | .169 | .006 |
| Political Orientation | 1 | 0.00 | 0.04 | .850 | .950 | .000 |
| Country * Group | 1 | 0.01 | 0.12 | .731 | .849 | .000 |
| ***I* parameter:** | | | | | | |
| Country | 1 | 19.17 | 235.31 | **< .001** | **< .001** | .243 |
| Group | 1 | 0.02 | 0.28 | .599 | .746 | .000 |
| Pride | 1 | 0.15 | 1.81 | .180 | .314 | .002 |
| Collective Narcissism | 1 | 0.43 | 5.33 | **.021** | .060 | .017 |
| National Identity | 1 | 1.37 | 16.77 | **< .001** | **< .001** | .032 |
| Political Orientation | 1 | 0.06 | 0.70 | .403 | .564 | .001 |
| Country * Group | 1 | 0.00 | 0.01 | .914 | .950 | .000 |
| **Traditional Score:** | | | | | | |
| Country | 1 | 109.09 | 49.13 | **< .001** | **< .001** | .0.50 |
| Group | 1 | 7.50 | 3.38 | .067 | .148 | .010 |
| Pride | 1 | 4.63 | 2.08 | .149 | .278 | .004 |
| Collective Narcissism | 1 | 5.23 | 2.36 | .125 | .242 | .009 |
| National Identity | 1 | 18.11 | 8.15 | **.004** | **.019** | .015 |
| Political Orientation | 1 | 0.02 | 0.01 | .929 | .950 | .000 |
| Country * Group | 1 | 0.06 | 0.03 | .872 | .950 | .000 |

Note: *C* parameter – sensitivity to consequences, *N* parameter – sensitivity to norms, *I* parameter – tendency toward inaction, IB – impartial beneficence, IH – instrumental harm.

Pride, collective narcissism, and national identity were moderately related to various utilitarian measures. Pride was positively linked to support for utilitarian choices in trolley and footbridge scenarios, as well as instrumental harm and impartial beneficence. Collective narcissism was consistently associated with greater support for utilitarian decisions in the footbridge dilemma and instrumental harm, along with a higher sensitivity to consequences and norms. National identity was connected to greater acceptance of impartial beneficence, instrumental harm, and the traditional score of the

CNI, as well as a stronger tendency toward inaction. Political orientation showed no significant relationship with any utilitarian measures. Covariates related to national attachment did not affect the significance of instrumental harm, suggesting that this model does not fully account for the observed effect.

### 5.3.4. Musical Covariates

I also conducted exploratory ANCOVA analyses to test if music-related variables influenced the main effect. After testing for collinearity (Table 6), I used utilitarian measures as a dependent variable, country and group as fixed factors, and musical education, favorite musical genre, and time spent on attentive listening to music daily as covariates (Table 7).

**Table 6**

*Study 1: Correlations Between Music Covariates*

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. |
|---|---|---|---|---|---|---|---|
| 1. Musical Education | - | | | | | | |
| 2. Favorite Genre: Smooth | .04 | - | | | | | |
| 3. Favorite Genre: Unpretentious | .07 | .30 | - | | | | |
| 4. Favorite Genre: Sophisticated | .13 | .31 | .31 | - | | | |
| 5. Favorite Genre: Intense | .20 | -.04 | .09 | .11 | - | | |
| 6. Favorite Genre: Rhythmic | .18 | .05 | .04 | .05 | .45 | - | |
| 7. Listening to Music | .31 | .05 | -.03 | -.00 | .27 | .28 | - |

**Table 7**

*Study 1: ANCOVA Analyses With Music Covariates*

| | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|
| **Trolley:** | | | | | | |
| Country | 1 | 172.73 | 43.52 | **< .001** | **< .001** | .073 |
| Group | 1 | 13.86 | 3.49 | .062 | .220 | .007 |
| Musical Education | 1 | 2.21 | 0.56 | .456 | .682 | .000 |
| Favorite Genre: Smooth | 1 | 22.75 | 5.73 | **.017** | .105 | .006 |

| | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|
| Favorite Genre: Unpretentious | 1 | 6.48 | 1.63 | .202 | .426 | .002 |
| Favorite Genre: Sophisticated | 1 | 1.12 | 0.28 | .596 | .780 | .000 |
| Favorite Genre: Intense | 1 | 17.75 | 4.47 | **.035** | .163 | .002 |
| Favorite Genre: Rhythmic | 1 | 9.78 | 2.46 | .117 | .323 | .004 |
| Listening to Music | 1 | 4.16 | 1.05 | .307 | .511 | .002 |
| Country * Group | 1 | 2.88 | 0.72 | .395 | .636 | .001 |
| **Footbridge:** | | | | | | |
| Country | 1 | 25.05 | 6.80 | **.009** | .068 | .019 |
| Group | 1 | 3.89 | 1.06 | .304 | .511 | .002 |
| Musical Education | 1 | 0.14 | 0.04 | .845 | .888 | .004 |
| Favorite Genre: Smooth | 1 | 35.21 | 9.56 | **.002** | **.021** | .008 |
| Favorite Genre: Unpretentious | 1 | 12.13 | 3.29 | .070 | .220 | .004 |
| Favorite Genre: Sophisticated | 1 | 6.20 | 1.68 | .195 | .426 | .003 |
| Favorite Genre: Intense | 1 | 9.12 | 2.48 | .116 | .323 | .000 |
| Favorite Genre: Rhythmic | 1 | 12.02 | 3.27 | .071 | .220 | .005 |
| Listening to Music | 1 | 4.78 | 1.30 | .255 | .483 | .002 |
| Country * Group | 1 | 0.53 | 0.15 | .704 | .827 | .000 |
| **OUS IB:** | | | | | | |
| Country | 1 | 25.49 | 14.37 | **< .001** | **.002** | .026 |
| Group | 1 | 1.12 | 0.63 | .427 | .658 | .001 |
| Musical Education | 1 | 0.24 | 0.13 | .714 | .827 | .000 |
| Favorite Genre: Smooth | 1 | 25.45 | 14.35 | **< .001** | **.002** | .026 |
| Favorite Genre: Unpretentious | 1 | 2.81 | 1.58 | .209 | .429 | .004 |
| Favorite Genre: Sophisticated | 1 | 0.69 | 0.39 | .535 | .739 | .000 |
| Favorite Genre: Intense | 1 | 8.48 | 4.78 | **.029** | .148 | .002 |
| Favorite Genre: Rhythmic | 1 | 8.61 | 4.86 | **.028** | .148 | .009 |
| Listening to Music | 1 | 0.01 | 0.00 | .948 | .948 | .000 |
| Country * Group | 1 | 0.16 | 0.09 | .764 | .848 | .000 |
| **OUS IH:** | | | | | | |
| Country | 1 | 6.65 | 3.82 | .051 | .205 | .005 |
| Group | 1 | 11.13 | 6.40 | **.012** | .078 | .011 |
| Musical Education | 1 | 0.20 | 0.12 | .734 | .827 | .004 |
| Favorite Genre: Smooth | 1 | 11.88 | 6.83 | **.009** | .068 | .009 |

| | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|
| Favorite Genre: Unpretentious | 1 | 0.43 | 0.25 | .620 | .787 | .001 |
| Favorite Genre: Sophisticated | 1 | 2.21 | 1.27 | .260 | .483 | .002 |
| Favorite Genre: Intense | 1 | 11.96 | 6.87 | **.009** | .068 | .001 |
| Favorite Genre: Rhythmic | 1 | 18.18 | 10.45 | **.001** | **.015** | .018 |
| Listening to Music | 1 | 2.06 | 1.19 | .277 | .497 | .002 |
| Country * Group | 1 | 2.99 | 1.72 | .190 | .426 | .003 |
| ***C* parameter:** | | | | | | |
| Country | 1 | 0.71 | 21.29 | **< .001** | **< .001** | .038 |
| Group | 1 | 0.11 | 3.30 | .070 | .220 | .006 |
| Musical Education | 1 | 0.06 | 1.91 | .167 | .394 | .004 |
| Favorite Genre: Smooth | 1 | 0.07 | 2.15 | .143 | .378 | .003 |
| Favorite Genre: Unpretentious | 1 | 0.00 | 0.02 | .889 | .900 | .000 |
| Favorite Genre: Sophisticated | 1 | 0.00 | 0.12 | .732 | .827 | .000 |
| Favorite Genre: Intense | 1 | 0.01 | 0.38 | .536 | .739 | .000 |
| Favorite Genre: Rhythmic | 1 | 0.01 | 0.34 | .558 | .757 | .001 |
| Listening to Music | 1 | 0.01 | 0.41 | .522 | .739 | .001 |
| Country * Group | 1 | 0.01 | 0.22 | .636 | .793 | .000 |
| ***N* parameter:** | | | | | | |
| Country | 1 | 0.13 | 1.44 | .230 | .460 | .000 |
| Group | 1 | 0.06 | 0.72 | .397 | .636 | .002 |
| Musical Education | 1 | 0.01 | 0.13 | .719 | .827 | .000 |
| Favorite Genre: Smooth | 1 | 0.05 | 0.55 | .460 | .682 | .002 |
| Favorite Genre: Unpretentious | 1 | 0.32 | 3.53 | .061 | .220 | .006 |
| Favorite Genre: Sophisticated | 1 | 0.00 | 0.03 | .855 | .888 | .000 |
| Favorite Genre: Intense | 1 | 0.11 | 1.17 | .280 | .497 | .000 |
| Favorite Genre: Rhythmic | 1 | 0.15 | 1.63 | .202 | .426 | .002 |
| Listening to Music | 1 | 0.10 | 1.07 | .301 | .511 | .002 |
| Country * Group | 1 | 0.01 | 0.16 | .690 | .827 | .000 |
| ***I* parameter:** | | | | | | |
| Country | 1 | 19.17 | 228.19 | **< .001** | **< .001** | .287 |
| Group | 1 | 0.02 | 0.27 | .605 | .780 | .000 |
| Musical Education | 1 | 0.12 | 1.40 | .238 | .464 | .001 |
| Favorite Genre: Smooth | 1 | 0.17 | 2.03 | .155 | .378 | .003 |

| | *df* | Mean Square | *F* | *p*-value | Adjusted *p*-value | $\eta^2_p$ |
|---|---|---|---|---|---|---|
| Favorite Genre: Unpretentious | 1 | 0.00 | 0.05 | .827 | .888 | .000 |
| Favorite Genre: Sophisticated | 1 | 0.00 | 0.02 | .888 | .900 | .000 |
| Favorite Genre: Intense | 1 | 0.32 | 3.84 | .051 | .205 | .001 |
| Favorite Genre: Rhythmic | 1 | 0.26 | 3.09 | .079 | .235 | .005 |
| Listening to Music | 1 | 0.06 | 0.67 | .415 | .651 | .001 |
| Country * Group | 1 | 0.00 | 0.04 | .836 | .888 | .000 |
| **Traditional Score:** | | | | | | |
| Country | 1 | 109.09 | 49.01 | **< .001** | **< .001** | .076 |
| Group | 1 | 7.50 | 3.37 | .067 | .220 | .006 |
| Musical Education | 1 | 0.15 | 0.07 | .796 | .872 | .001 |
| Favorite Genre: Smooth | 1 | 10.60 | 4.76 | **.030** | .148 | .010 |
| Favorite Genre: Unpretentious | 1 | 4.70 | 2.11 | .147 | .378 | .005 |
| Favorite Genre: Sophisticated | 1 | 0.65 | 0.29 | .590 | .780 | .000 |
| Favorite Genre: Intense | 1 | 9.77 | 4.39 | **.037** | .163 | .004 |
| Favorite Genre: Rhythmic | 1 | 0.94 | 0.42 | .516 | .739 | .000 |
| Listening to Music | 1 | 4.49 | 2.02 | .156 | .378 | .004 |
| Country * Group | 1 | 0.48 | 0.21 | .644 | .793 | .000 |

*Note. C* parameter – sensitivity to consequences, *N* parameter – sensitivity to norms, *I* parameter – tendency toward inaction, IB – impartial beneficence, IH – instrumental harm.

Musical education and listening to music had no effect on utilitarian judgments across all measures. Among favorite genres, a preference for smooth music was positively linked to higher support for impartial beneficence and footbridge dilemma, while a preference for rhythmic music was associated with a higher tendency toward instrumental harm. Similarly to the national attachment covariates, covariates related to music did not affect the significance of instrumental harm, suggesting that this model also does not fully explain the observed effect.

### 5.4. Study 1: Discussion

In Study 1, I investigated the influence of the national anthem on moral judgments aligned with utilitarianism among participants from the USA and China. In preregistered predictions, I assumed that participants listening to their national anthem would make more deontological-oriented decisions in the trolley dilemma than participants listening to the control song (H1); participants listening to their national anthem would make more deontological-oriented decisions in the footbridge dilemma than participants listening to the control song (H2); participants listening to their national anthem would have a lower score in the *C* parameter (sensitivity to consequences) than participants listening to the control song (H3.1); participants listening to their national anthem would have a higher score in the *N* parameter (sensitivity to norms) than participants listening to the control song (H3.2); participants listening to their national anthem would have lower scores in the *I* parameter (preference for inaction) than participants listening to the control song (H3.3); for the traditional score of CNI, participants listening to their national anthem would make more deontological-oriented decisions than participants listening to the control song (H3.4); participants listening to their national anthem would have a lower level of the impartial beneficence scale than participants listening to the control song (H4.1); participants listening to their national anthem would have a lower score of the instrumental harm scale than participants listening to the control song (H4.2).

We confirmed only the last prediction (H4.2), finding lower results on the instrumental harm measure after listening to the national anthem, though the effect size was small. However, the significance persisted even after applying the Benjamini-Hochberg correction. This result indicates that participants were less likely to harm others for the greater good after listening to the national anthem.

The null effects observed for all other hypotheses suggest that listening to the national anthem did not influence how participants resolved moral dilemmas about harming a minority to benefit a majority or maximizing happiness for more people. In light of Plato's ideas discussed in the Introduction, one might expect that the national anthem could inspire individuals to choose certain options in moral dilemmas or in the philosophical utilitarian statements presented in the OUS. Although Plato believed certain types of music could foster virtues like courage and self-discipline, his ideas were never scientifically confirmed and may not apply to today's moral decision-making, especially in the context of utilitarian ethics.

So, why was the impact of the national anthem weaker than expected? First, participants were tested in an online survey, and this specific context might have influenced the results. It is still possible that being part of a group on a battlefield or participating in a school ceremony while singing one's national anthem might evoke stronger feelings and influence moral reasoning. This study only revealed null effects under this particular experimental condition. Whether these results would be replicated in other settings or if the anthem's influence would emerge under different circumstances remains uncertain. This highlights the need for further research to determine whether the national anthem lacks significant psychological power or if specific conditions must be met for its impact to manifest. Additionally, it is worth considering that some people today may experience a crisis of attachment to their own country. Current economic struggles, unmet government promises, and widespread social dissatisfaction could weaken the anthem's emotional and symbolic power.

Another possible explanation for not confirming other hypotheses is that the instrumental harm differs from any other measure tested in this study. As part of the OUS, it consists of philosophical statements, not moral dilemmas (often detached from reality

like in the trolley and footbridge dilemmas), and represents moral opinion, not judgments. Instrumental harm also differs from the other subscale of the same measure, impartial beneficence. Impartial beneficence is called positive utilitarianism, where the participant does not need to sacrifice anyone to produce the greater good, as it is in the instrumental harm orientation. This way, instrumental harm is a measure that provides a unique perspective in this study, showing that listening to the national anthem can impact sacrificial beliefs slightly.

I also exploratory tested country differences; I found that in trolley and footbridge dilemmas, as well as in impartial beneficence, Chinese participants in their decisions were less utilitarian-oriented than Americans. These results are consistent with past studies (Bago et al., 2022).

National attachment, including collective narcissism and national identity (but not conservative political orientation), was positively related to most measures of utilitarianism, and pride was the strongest emotion after listening to the national anthem. Based on these results, I suggest that lower scores on the instrumental harm measure might come from the combination of increased pride and stronger national attachment. However, the instrumental harm measure remained significant even after accounting for national attachment variables, which suggests that these variables do not fully explain this effect.

The effects of the musical covariates were marginal, and controlling for them did not alter the results of any of the dependent variables.

### 5.5. Study 1: Limitations and Future Directions

This study has limits. First, the two musical pieces used in the study – an anthem and a control piece – were not perfectly matched. The anthem naturally triggered emotions related to patriotism, i.e., pride, while the control music aimed to be more like

background music in a controlled setting without a strong emotional impact. As mentioned earlier, we avoided options like silence or white noise to avoid participants' irritation. Also, since there is no other piece of music with such an emotional charge and meaning as the national anthem, choosing music as neutral as possible was our best option for control. Moreover, we used the anthem with lyrics, and the control piece was instrumental alone. Even though results from the pilot study showed no differences in participants' emotional reactions while listening to the national anthem with or without lyrics, it raises questions addressed by some studies about the possible interference of the lyrics (e.g., Brattico et al., 2011). Considering the above, establishing a precisely matched pair of musical pieces presents an opportunity for further research. Future studies may also employ a clearer manipulation in which participants from both countries listen to both national anthems, with the foreign national anthem serving as the control music. Second, we conducted the study in only two countries, making it difficult to generalize the results. Future studies could be conducted in more countries from different parts of the world, where the meaning and content of national anthems may vary. Third, we tested only the effect of listening to the national anthem in front of a computer. In real life, people usually listen to national anthems when standing (or in a very formal position), mostly in groups. Future studies should examine potential contextual influences on people's judgments (e.g., Schein, 2020) e.g. by testing listening to the national anthem in groups. Fourth, the sample size was incorrectly estimated, leading to potential issues with statistical power. The sample size estimation was based on a repeated measures design, while the analysis conducted required a fixed effects model. This miscalculation may have resulted in an overestimation of the expected effect size ($f$ = .18) compared to the smaller effect size ($\eta^2p$ = .012) observed in the study. Despite this, the results remain valid, even after applying the Benjamini-Hochberg p-value correction, but future research

should aim to more accurately calculate the sample size based on the correct statistical model to ensure the robustness of the findings and maybe find more nuances. Fifth, the reliability of the CNI model was poor, which was also reflected in the inadequate model fit for both group and country comparisons. Due to its low reliability, I did not analyze the results from the CNI further. This could be due to the fatigue discussed in section 1.3.1.4, which arises from the need for intense concentration when reading long dilemmas, a process that is also time-consuming. These issues should be taken into account when designing future studies. Sixth, the order of the measures in the study was fixed, which may have caused an order effect. We cannot be sure whether the lower instrumental harm scores were due to listening to the national anthem itself or simply the relief of finishing the long and difficult CNI model, even though there was a musical reminder just before answering the OUS questions. We also cannot be sure whether the lack of other effects reflects a true absence of influence in this experimental setting or if it was due to fatigue from answering harder questions (like those in the CNI model) before easier ones (such as the trolley dilemma). Future studies may randomize the order of the measures to address this issue. Finally, study participants were Americans living in the USA listening to the US national anthem and Chinese living in China listening to the Chinese national anthem. I do not know if the same effect would appear among, for example, national minorities living in the USA and listening to the US national anthem or Chinese participants residing in the USA and listening to the Chinese national anthem. Future studies should also test such different national situations

### 5.6. Study 1: Conclusions

Moral decisions are characterized by their stability in certain contexts (e.g., Knobe, 2021) but can also shift depending on situational factors, such as music (Gawronski et al., 2018). It has long been understood that listening to music can evoke

emotions and alter our attitudes, with national anthems, in particular, often stirring feelings of pride and social unity (Gilboa & Bodner, 2009). However, until now, the impact of listening to a national anthem on moral decisions has not been explored. To the best of my knowledge, this study is the first to investigate this relationship. It revealed that after listening to the national anthem, adult participants from the USA and China were less accepting of the right to harm minorities for the greater good of the majority (a lower level of instrumental harm) than participants listening to the control piece of music. However, listening to the national anthem did not influence how participants resolved moral dilemmas about harming a minority to benefit a majority or how they considered maximizing happiness for more people. In sum, it was surprising that the national anthem's impact on moral decisions was not as significant as anticipated, given that one might expect such a powerful symbol to evoke stronger shifts in moral reasoning.

## 6. Study 2

This Chapter is based on the manuscript ready to be submitted to the journal (Pypno-Blajda et al., *in review*).

### 6.1. Study 2: The Current Research

In Study 2, I aimed to test whether music influences the self-importance of moral identity and moral foundations (Study 2a). Then, whether the observed effect was driven specifically by music or only by emotions evoked by music (Study 2b). Lastly, I studied the cultural differences beyond the perception of the musical stimuli (Study 2c).

All studies were preregistered (Study 2a: https://osf.io/wcqj6; Study 2b: https://osf.io/vr9he; Study 2c: https://osf.io/3a95r) and approved by the Ethics Committee of the University of Silesia in Katowice (Study 2a: approval no. **KEUS397/05.2023**; Study 2b: approval no. **KEUS514/06.2024**; Study 2c: approval no. **KEUS/O/12/10.2024**).

All statistical analyses were conducted using R and RStudio software and are available on the OSF repository (Study 2a: https://osf.io/fku9z/; Study 2b: https://osf.io/7hpef/; Study 2c: https://osf.io/w7ug5/).

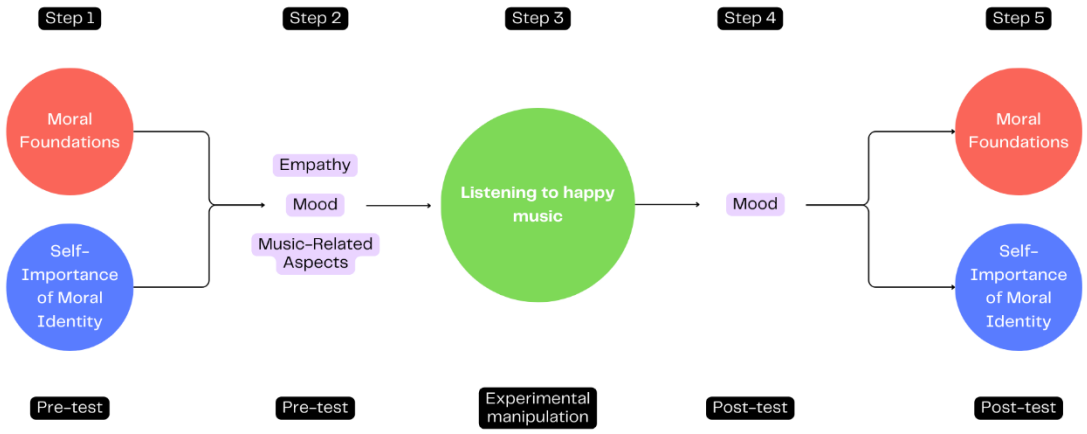
### 6.2. Study 2a

First, I aimed to test whether the piece of music high on valence and arousal (mostly evoking happiness, so later called *happy music*) would influence the self-importance of moral identity measured with the Self-Importance of Moral Identity Scale and moral foundations measures with Moral Foundations Questionnaire and what affects it evokes. I also asked participants about music-related aspects, including their music preferences, the amount of time they spend every day listening attentively to music, and their music education, which is explained in section 5.1. We know that music may increase empathy (see the review: Clarke et al., 2015). However, people with high

empathy may also perceive music differently (Vuoskoski & Eerola, 2012). Empathy is a factor often suggested to help explain the gap between moral beliefs and moral actions (Bergman, 2002; Darnell et al., 2019). In this study, I wanted to test it from a different perspective: whether the participants' level of empathy would interact with the potential power of music to change the self-importance of moral identity and moral foundations. Moreover, just before and just after listening to music, I asked participants about their positive and negative moods to see the changes in their affective perception of music (see Figure 3).

**Figure 3**

*The Graphic Representation of Study 2a Design*




Previous research showed that positive-valence music evoked positive emotions (mostly happiness; see the meta-analysis: Koelsch, 2020), and musically induced positive emotions decreased the harshness of moral judgments (Ansani et al., 2019; Seidel & Prinz, 2013). To the best of my knowledge, there is no research on music and moral identity; however, based on past research on the impact of music on moral judgments, I suspected that music may also influence how relevant it is for someone to be a good

person. Specifically, I preregistered predictions that listening to happy music (H1) would increase positive affect, (H2) would make moral identity less important to participants, and (H3) would make moral foundations less relevant to participants. Cultural differences and covariates were treated as exploratory.

### 6.2.1. Methods

#### 6.2.1.1. Participants

The preregistered sample size was $N$ = 180 (90 participants per country). I conducted a power analysis in G*power for t-tests, Means: Difference between two dependent means (matched pairs), two tails, 80% of power, with a margin of error of $\alpha$ = .05, and the effect size 0.3. At last, I collected a sample of $N$ = 183; $n$ = 90 participants from the USA ($n$ = 54 women) and $n$ = 93 participants from China ($n$ = 52 women).

Participants were recruited via the Prolific platform in the USA and the Credamo platform in China. All participants completed the online survey in their native language (American English or Mandarin Chinese). The average age of participants was $M$ = 43.7 ($SD$ = 12.6) in the USA and $M$ = 22.9 ($SD$ = 4.3) in China. Less than half of Americans ($n$ = 34) and most of the participants in China ($n$ = 71) were nonreligious. However, the major religions were Protestantism in the USA ($n$ = 21) and Buddhism in China ($n$ = 13). Participants from the USA were slightly more liberal (on a 7-point liberal-conservative scale, $M$ = 3.4, $SD$ = 1.7), while participants from China were slightly more conservative ($M$ = 3.9, $SD$ = 1.2 on a 7-point liberal-conservative scale; the difference between the two countries was significant ($t$(318.49) = -3.29; $p$ = .001).

#### 6.2.1.2. Procedure

The research design was mixed, as each participant filled out the questionnaires twice at an interval of 7-10 days (within-subject design), and I also compared samples from two countries (between-subject design). In the first measurement of participants

from both countries, I asked them to provide demographic data and information about their musical experience and complete the empathy scale. Then, participants were asked to fill out questionnaires regarding their self-importance of moral identity and moral foundations. At the end, participants created a specific code for the second measurement. The code enabled me to link data obtained from the first measurement with the second one. At the beginning of the second measurement, after a minimum of a week, participants from both countries repeated their unique code from the first part of the study. Then, they were asked to describe their actual mood on the PANAS. Next, they listened to music (they were previously asked to have headphones to participate in the experiment). Everyone listened to the same piece of music, a 1-minute excerpt from *Pride & Prejudice* from a previously established music and emotion dataset, which has been rated as high on valence ($M$ = 8.0 on a scale of 1-9) and arousal ($M$ = 8.3 on a scale of 1-9; Vuoskoski & Eerola, 2012) but was not particularly familiar to most listeners (89.9% of participants rated the music from the database as *unfamiliar;* Eerola & Vuoskoski, 2011). The music is available on the project's OSF page as Track 105 from the Set2 folder (https://osf.io/yn7vg). After listening to the music, participants were asked again to describe their actual mood on PANAS and then fill in questionnaires about their self-importance of moral identity and moral foundations, the same as during the previous measurement. Additionally, I used two attention checks inside the survey to test if participants were focused. One task was to write down the three-digit number that the lector spoke during the song. Writing down two out of three digits was counted as correct. Otherwise, the whole record from that participant was withdrawn from analyses. The second was a question of whether the participants' answers were honest and whether I should include them in the final analysis (yes/ no) (Curran, 2016). I excluded participants who answered "no" to that question from further statistical analyses. These

two attention checks resulted in the exclusion of $n$ = 8 records from the USA and $n$ = 2 records from China. The time required for this study was approximately 20 minutes, 10 per measurement.

#### 6.2.1.3. Measures

**Affect.** I used the Positive and Negative Affect Scale (PANAS; Watson et al., 1988 in Chinese translation by Qui et al., 2008). PANAS consists of two 10-item scales, one for measuring positive and one for measuring negative affect. Each affect is described by 10 single words, e.g., "interested," "alert," and "strong" for positive, and "guilty," "irritable," and "hostile" for negative affect, and was presented to participants in the same randomized order. Participants answered how much they felt that way in the present moment on a 5-point scale, from 1 = *very slightly or not at all* to 5 = *extremely*. Both scales had very good reliability (positive affect: McDonald's ω = .91 for pre-test, ω = .93 for post-test; negative affect: ω = .94 for pre-test, ω = .95 for post-test, all for the whole sample).

**Moral Identity.** I used The Self-Importance of Moral Identity Questionnaire (SMI-Q; Aquino & Reed, 2002, in Chinese translation by my team). The SMI-Q consists of two 5-item factors: internalization and symbolization. The internalization scale tests how important it is to the participant to be a moral person, whereas the symbolization scale aims to indicate whether an individual's actions reflect a moral self-expression or a commitment to moral principles. First, participants were asked to visualize that they were a person with nine moral characteristics such as "compassionate," "fair," or "generous," then they were asked to imagine how such a person would behave, think, or feel, and finally they were answering questions such as "It would make me feel good to be a person who has these characteristics" on a scale from 1 = *strongly disagree* to 5 = *strongly agree.* Overall, both the internalization (ω = .79 for pre-test; ω = .77 for post-

test) and symbolization (ω = .86 for pre-test; ω = .82 for post-test) scales had good reliability.

**Moral Foundations.** I used the Moral Foundations Questionnaire (MFQ; Graham et al., 2011 in Chinese translation by Buchtel et al., 2012). It consists of 30 items divided into two subscales. In the *relevance* subscale, participants were asked to indicate how relevant it was for them on a scale ranging from 1 = *not at all relevant* to 6 = *extremely relevant*, e.g., "Whether or not someone suffered emotionally." The score was counted separately for each foundation, and the reliability (care: ω = .60 for pre-test, ω = .56 for post-test; fairness: ω = .48 for pre-test, ω = .54 for post-test; loyalty: ω = .63 for pre-test, ω = .55 for post-test; authority: ω = .68 for pre-test, ω = .59 for post-test; purity: ω = .67 for pre-test, ω = .66 for post-test) was mostly satisfactory. The higher the score on each foundation, the more relevant it was to the participant. In the *judgments* subscale, participants were asked to answer how much they agree with statements about different moral foundations on a scale ranging from 1 = *strongly disagree* to 6 = *strongly agree*, e.g., "Compassion for those who are suffering is the most crucial virtue." As previously, the score was counted separately for each foundation, and the reliability (care: ω = .33 for pre-test, ω = .39 for post-test; fairness: ω = .42 for pre-test, ω = .43 for post-test; loyalty: ω = .49 for pre-test, ω = .40 for post-test; authority: ω = .41 for pre-test, ω = .35 for post-test; purity: ω = .55 for pre-test, ω = .64 for post-test) was mostly satisfactory. The higher the score on each foundation, the more participants agreed with them. Scores can also be counted for each foundation in general. Here the reliability (care: ω = .52 for pre-test, ω = .59 for post-test; fairness: ω = .49 for pre-test, ω = .51 for post-test; loyalty: ω = .61 for pre-test, ω = .60 for post-test; authority: ω = .61 for pre-test, ω = .57 for post-test; purity: ω = .70 for pre-test, ω = .73 for post-test) was also mostly satisfactory. The general

score means the importance of moral foundations for the participant, including their relevance and judgments.

**Empathy.** I used the Perth Empathy Scale (Brett et al., 2023, in Chinese translation by my team). The scale measures how easy it is for the participant to recognize and share the emotions of others. It is a multidimensional construct of cognitive empathy (the ability to recognize others' emotions) and affective empathy (the ability to share others' emotions), both for positive and negative affect. The measure consists of 20 items, 5 for each dimension, which participants answer on a 5-point scale ranging from 1 = *almost never* and 5 = *almost always*, e.g., "Just by seeing or hearing someone, I know if they are feeling sad." The reliability of each scale (negative-cognitive empathy: ω = .86; negative-affective empathy: ω = .75; positive-cognitive empathy: ω = .89; positive-affective empathy: ω = .73) was good.

**Music-Related Aspects.** See Study 1.

**Socio-Demographics.** See Study 1.

### 6.2.2. Results

#### 6.2.2.1. Manipulation Check

To test the hypotheses about the affect and whether my experimental manipulation was valid, I asked about participants' moods right before and right after listening to music. I present the descriptive statistics in Table 8.

**Table 8**

*Study 2a: Descriptive Statistics of the Manipulation Check*

| | The USA | | China | |
|---|---|---|---|---|
| | pre-test *M* (*SD*) | post-test *M* (*SD*) | pre-test *M* (*SD*) | post-test *M* (*SD*) |
| Positive Affect | 30.1 (9.7) | 31.1 (9.9) | 29.9 (6.7) | 30.6 (7.5) |
| Negative Affect | 12.9 (5.6) | 12.2 (5.0) | 22.1 (7.2) | 19.0 (7.4) |

Then, I conducted LMM of negative and positive affects as fixed factors, country as a between-subject factor, and measurement (pre-test and post-test) as a within-subject, e.g., positive_affect ~ measurement * country + (1 | ID) (Table 9).

**Table 9**

*Study 2a: Results of the Linear Mixed Model Analysis for the Manipulation Check*

| | | | Standard | | | Adjusted *p*- |
|---|---|---|---|---|---|---|
| | Affect | Estimate | Error | 95% CI | *p*-value | value |
| Measurement | Positive | 0.92 | 0.44 | [0.05, 1.79] | **.039** | .079 |
| | Negative | -0.73 | 0.35 | [-1.41, -0.06] | **.035** | **.035** |
| Country | Positive | -0.22 | 1.26 | [-2.69, 2.25] | .862 | .862 |
| | Negative | 9.18 | 0.95 | [7.33, 11.04] | < **.001** | < **.001** |
| Interaction | Positive | -0.20 | 0.62 | [-1.42, 1.02] | .747 | .862 |
| | Negative | -2.42 | 0.49 | [-3.37, -1.47] | < **.001** | < **.001** |

After listening to happy music, participants' negative affect decreased, with a more pronounced effect among Chinese participants compared to Americans. However, even though the negative affect among Chinese participants was lower after listening to the happy song, it still remained much higher than that of Americans before the manipulation. The positive affect remained unaffected.

#### 6.2.2.2. Main Analyses

I present descriptive statistics in Table 10.

**Table 10**

*Study 2a: Descriptive Statistics of Main Variables*

| | The USA | | China | |
|---|---|---|---|---|
| | pre-test | post-test | pre-test | post-test |
| | *M* (*SD*) | *M* (*SD*) | *M* (*SD*) | *M* (*SD*) |
| **Self-Importance of Moral Identity** | | | | |
| Internalization | 22.2 (3.0) | 21.9 (3.2) | 20.1 (3.4) | 19.6 (3.3) |

| | The USA | | China | |
|---|---|---|---|---|
| | pre-test | post-test | pre-test | post-test |
| | *M* (*SD*) | *M* (*SD*) | *M* (*SD*) | *M* (*SD*) |
| Symbolization | 16.2 (4.7) | 15.8 (4.5) | 17.5 (3.4) | 17.2 (2.9) |
| **Moral Foundations** | | | | |
| **Care** | | | | |
| Main Score | 19.3 (3.9) | 19.9 (3.9) | 14.7 (3.7) | 14.8 (3.9) |
| Relevance | 10.4 (2.4) | 10.2 (2.2) | 6.9 (2.5) | 7.1 (2.2) |
| Judgment | 9.2 (2.4) | 9.5 (2.4) | 7.8 (2.8) | 7.7 (2.6) |
| **Fairness** | | | | |
| Main Score | 19.1 (4.7) | 19.3 (4.8) | 19.3 (3.7) | 18.6 (3.6) |
| Relevance | 9.2 (2.7) | 9.3 (2.9) | 7.9 (2.8) | 7.9 (2.5) |
| Judgment | 9.6 (2.9) | 9.7 (2.9) | 11.4 (2.0) | 10.8 (2.1) |
| **Loyalty** | | | | |
| Main Score | 18.5 (5.3) | 18.0 (5.3) | 15.8 (4.5) | 16.1 (4.2) |
| Relevance | 9.9 (2.7) | 9.5 (2.8) | 6.6 (3.2) | 7.0 (2.8) |
| Judgment | 8.5 (3.3) | 8.4 (3.4) | 9.2 (2.7) | 9.1 (2.5) |
| **Authority** | | | | |
| Main Score | 18.7 (4.9) | 18.8 (4.8) | 17.4 (4.2) | 17.3 (3.6) |
| Relevance | 9.5 (2.9) | 9.4 (3.1) | 7.4 (3.3) | 7.8 (2.8) |
| Judgment | 9.3 (2.5) | 9.5 (2.6) | 10.0 (2.1) | 9.5 (1.8) |
| **Purity** | | | | |
| Main Score | 18.7 (6.2) | 18.5 (6.0) | 15.4 (4.0) | 15.4 (4.4) |
| Relevance | 8.9 (3.5) | 8.7 (3.4) | 5.8 (2.5) | 6.4 (2.5) |
| Judgment | 9.7 (3.2) | 9.6 (3.3) | 9.6 (2.9) | 9.0 (2.9) |

Next, I carried out a LMM analysis. The self-importance of moral identity and moral foundations regarding general preference, relevance, and judgments were fixed factors; country was the between-subjects factor, measurement was within-subjects factors, and participants' ID was a random factor, e.g., care ~ measurement * country +

(1 | ID). The model was run simultaneously for all variables as a single analysis; however, for clarity, I present the results in two separate tables (Tables 11 and 12).

**Table 11**

*Study 2a: Results of the Linear Mixed Model Analysis for Self-Importance of Moral Identity and the Main Score of MFQ*

| | Self-Importance of Moral Identity | | Moral Foundations | | | | |
|---|---|---|---|---|---|---|---|
| | Internalization | Symbolization | Care | Fairness | Loyalty | Authority | Purity |
| **Measurement:** | | | | | | | |
| Estimate | -0.30 | -0.33 | 0.54 | 0.17 | -0.47 | 0.09 | -0.28 |
| Standard Error | 0.29 | 0.30 | 0.34 | 0.34 | 0.40 | 0.40 | 0.37 |
| 95% CI | [-0.88, 0.28] | [-0.92, 0.25] | [-0.13, 1.22] | [-0.51, 0.84] | [-1.25, 0.32] | [-0.69, 0.87] | [-1.00, 0.44] |
| *p*-value | .308 | .268 | .113 | .629 | .244 | .824 | .452 |
| Adjusted *p*-value | .411 | .357 | .151 | .734 | .244 | .824 | .603 |
| **Country:** | | | | | | | |
| Estimate | -2.11 | 1.30 | -4.67 | 0.21 | -2.67 | -1.31 | -3.29 |
| Standard Error | 0.48 | 0.58 | 0.56 | 0.62 | 0.71 | 0.65 | 0.77 |
| 95% CI | [-3.04, -1.18] | [0.17, 2.42] | [-5.77, -3.56] | [-1.01, 1.43] | [-4.07, -1.27] | [-2.59, -0.04] | [-4.81, -1.78] |
| *p*-value | **< .001** | **.025** | **< .001** | .734 | **< .001** | **.045** | **< .001** |
| Adjusted *p*-value | **< .001** | .050 | **< .001** | .734 | **< .001** | .090 | **< .001** |
| **Interaction:** | | | | | | | |
| Estimate | -0.15 | 0.11 | -0.42 | -0.88 | 0.72 | -0.15 | 0.22 |
| Standard Error | 0.41 | 0.42 | 0.48 | 0.48 | 0.56 | 0.56 | 0.52 |
| 95% CI | [-0.96, 0.66] | [-0.72, 0.93] | [-1.36, 0.53] | [-1.82, 0.07] | [-0.37, 1.82] | [-1.25, 0.94] | [-0.79, 1.24] |
| *p*-value | .713 | .798 | .388 | .071 | .197 | .784 | .665 |
| Adjusted *p*-value | .713 | .798 | .388 | .142 | .244 | .824 | .665 |

**Table 12**

*Study 2a: Results of the Linear Mixed Model Analysis for Relevance and Judgments Subscales of MFQ*

| | Care | | Fairness | | Loyalty | | Authority | | Purity | |
|---|---|---|---|---|---|---|---|---|---|---|
| | R | J | R | J | R | J | R | J | R | J |
| **Measurement:** | | | | | | | | | | |
| Estimate | 0.14 | 0.31 | 0.06 | 0.08 | -0.40 | -0.11 | -0.11 | 0.16 | -0.17 | -0.10 |
| Standard Error | 0.24 | 0.22 | 0.27 | 0.18 | 0.30 | 0.21 | 0.29 | 0.21 | 0.28 | 0.20 |
| 95% CI | [-0.32, 0.61] | [-0.13, 0.75] | [-0.47, 0.58] | [-0.28, 0.43] | [-0.99, 0.19] | [-0.53, 0.31] | [-0.67, 0.45] | [-0.25, 0.56] | [-0.71, 0.37] | [-0.49, 0.29] |
| *p*-value | .546 | .165 | .836 | .667 | .186 | .605 | .699 | .450 | .546 | .612 |
| Adjusted *p*-value | .728 | .183 | .836 | .667 | .186 | .807 | .699 | .450 | .546 | .816 |
| **Country:** | | | | | | | | | | |
| Estimate | -3.15 | -1.46 | -1.32 | 1.75 | -3.33 | 0.71 | -2.10 | 0.62 | -3.08 | -0.05 |
| Standard Error | 0.34 | 0.37 | 0.40 | 0.37 | 0.43 | 0.44 | 0.45 | 0.34 | 0.44 | 0.46 |
| 95% CI | [-3.82, -2.48] | [-2.19, -0.73] | [-2.10, -0.54] | [1.03, 2.47] | [-4.17, -2.49] | -0.15, 1.58] | [-2.97, -1.23] | [-0.04, 1.28] | [-3.94, -2.22] | [-0.95, 0.84] |
| *p*-value | **< .001** | **< .001** | **.001** | **< .001** | **< .001** | .105 | **< .001** | .066 | **< .001** | .905 |
| Adjusted *p*-value | **< .001** | **< .001** | **.002** | **< .001** | **< .001** | .211 | **< .001** | .088 | **< .001** | .905 |
| **Interaction:** | | | | | | | | | | |
| Estimate | 0.09 | -0.42 | -0.13 | -0.71 | 0.77 | 0.00 | 0.54 | -0.65 | 0.72 | -0.50 |
| Standard Error | 0.34 | 0.31 | 0.38 | 0.25 | 0.42 | 0.30 | 0.40 | 0.29 | 0.39 | 0.28 |
| 95% CI | [-0.56, 0.75] | [-1.03, 0.20] | [-0.87, 0.61] | [-1.21. -0.22] | [-0.06, 1.59] | [-0.59, 0.59] | [-0.25, 1.33] | [-1.21, -0.09] | [-0.04, 1.47] | [-1.04, 0.04] |
| *p*-value | .784 | .183 | .728 | **.006** | .072 | .991 | .180 | **.025** | .066 | .070 |
| Adjusted *p*-value | .784 | .183 | .836 | **.007** | .096 | .991 | .240 | .050 | .088 | .141 |

*Note*. R = Relevance of Moral Foundation; J = Judgments About Moral Foundation;

I observed no differences between measurements in moral identity and foundations (Table 11). However, I observed country differences in almost all variables. For Americans, feeling like a moral person (higher internalization) was more important.

Regarding general preference for moral foundations, Americans had higher care, loyalty, and purity than Chinese individuals. Regarding the relevance subscale of the MFQ, all foundations were rated as more relevant by American than Chinese participants. In the judgments subscale of the MFQ, care was more important for Americans, whereas fairness was more important for Chinese participants. The results in the interaction section indicate that Chinese participants, after listening to happy music, judged fairness as less important to them compared to American participants.

#### 6.2.2.3. Covariates

As there was no strong collinearity between covariates (Table 13), I tested whether variables such as musical education, favorite music genre, time spent listening to music daily and empathy would influence the results. I conducted LMM with the above variables as random effects, e.g., care ~ measurement * culture + musician + smooth + unpretentious + sophisticated + intense + rhythmic + music_time + empathy + (1 | ID). The model was run simultaneously for all variables as a single analysis; however, for clarity, I present the results in two separate tables (Tables 14 and 15).

**Table 13**

*Study 2a: Correlations Between Covariates*

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|
| 1. Musical Education | - | | | | | | | |
| 2. Favorite Genre: Smooth | .03 | - | | | | | | |
| 3. Favorite Genre: Unpretentious | -.02 | .35 | - | | | | | |
| 4. Favorite Genre: Sophisticated | .16 | .30 | .21 | - | | | | |
| 5. Favorite Genre: Intense | .22 | -.02 | .09 | .11 | - | | | |
| 6. Favorite Genre: Rhythmic | .13 | -.06 | -.04 | -.03 | .34 | - | | |
| 7. Listening to Music | .20 | .10 | .08 | .14 | .24 | .19 | - | |
| 8. Empathy | .14 | .26 | .05 | .12 | .09 | .11 | .25 | - |

**Table 14**

*Study 2a: Results of the Linear Mixed Model Analysis for Musical Education, Listening to Music, and Empathy Covariates*

| | Measurement | Country | Musical Education | Listening to Music | Empathy | Measurement * Country |
|---|---|---|---|---|---|---|
| **Self-Importance of Moral Identity** | | | | | | |
| **Symbolization** | | | | | | |
| Estimate | -0.33 | 2.04 | 0.04 | 0.25 | 0.09 | 0.11 |
| Standard Error | 0.30 | 0.60 | 0.27 | 0.19 | 0.02 | 0.42 |
| 95% CI | [-0.92, 0.25] | [0.88, 3.20] | [-0.48, 0.56] | [-0.12, 0.61] | [0.05, 0.13] | [-0.72, 0.93] |
| *p*-value | .268 | **.001** | .877 | .193 | **<.001** | .798 |
| Corrected *p*-value | .357 | **.003** | .877 | .289 | **.001** | .871 |
| **Internalization** | | | | | | |
| Estimate | -0.30 | -1.91 | 0.18 | -0.11 | 0.05 | -0.15 |
| Standard Error | 0.29 | 0.52 | 0.23 | 0.16 | 0.02 | 0.41 |
| 95% CI | [-0.88, 0.28] | [-2.90, -0.91] | [-0.25, 0.62] | [-0.42, 0.20] | [0.01, 0.08] | [-0.96, 0.66] |
| *p*-value | .308 | **<.001** | .425 | .491 | **.014** | .713 |
| Corrected *p*-value | .462 | **.002** | .510 | .535 | .057 | .713 |
| **Moral Foundations** | | | | | | |
| **Care** | | | | | | |
| **Main Score** | | | | | | |
| Estimate | 0.54 | -4.52 | 0.28 | -0.18 | 0.04 | -0.42 |
| Standard Error | 0.34 | 0.63 | 0.28 | 0.19 | 0.02 | 0.48 |
| 95% CI | [-0.13, 1.22] | [-5.73, -3.32] | [-0.25, 0.81] | [-0.55, 0.19] | [-0.01, 0.08] | [-1.36, 0.53] |
| *p*-value | .113 | **<.001** | .313 | .358 | .103 | .388 |
| Corrected *p*-value | .272 | **<.001** | .517 | .517 | .272 | .517 |
| **Relevance** | | | | | | |
| Estimate | 0.14 | -3.26 | -0.03 | -0.17 | 0.02 | 0.09 |
| Standard Error | 0.24 | 0.38 | 0.16 | 0.11 | 0.01 | 0.34 |
| 95% CI | [-0.32, 0.61] | [-3.98, -2.54] | [-0.34, 0.27] | [-0.39, 0.05] | [-0.00, 0.05] | [-0.56, 0.75] |
| *p*-value | .546 | **<.001** | .832 | .132 | .076 | .784 |
| Corrected *p*-value | .893 | **<.001** | .893 | .302 | .228 | .893 |
| **Judgments** | | | | | | |
| Estimate | 0.31 | -1.23 | 0.35 | -0.01 | 0.01 | -0.42 |

| | Measurement | Country | Musical Education | Listening to Music | Empathy | Measurement * Country |
|---|---|---|---|---|---|---|
| Standard Error | 0.22 | 0.42 | 0.19 | 0.13 | 0.02 | 0.31 |
| 95% CI | [-0.13, 0.75] | [-2.03, -0.42] | [-0.00, 0.71] | [-0.26, 0.24] | [-0.02, 0.04] | [-1.03, 0.20] |
| *p*-value | .165 | **.004** | .059 | .960 | .496 | .183 |
| Corrected *p*-value | .366 | **.023** | .214 | .973 | .662 | .366 |
| **Fairness** | | | | | | |
| **Main Score** | | | | | | |
| Estimate | 0.17 | -0.08 | -0.55 | -0.19 | 0.06 | -0.88 |
| Standard Error | 0.34 | 0.67 | 0.30 | 0.21 | 0.02 | 0.48 |
| 95% CI | [-0.51, 0.84] | [-1.35, 1.20] | [-1.12. 0.02] | [-0.58, 0.21] | [0.01, 0.10] | [-1.82, 0.07] |
| *p*-value | .629 | .910 | .065 | .376 | **.022** | .071 |
| Corrected *p*-value | .754 | .910 | .142 | .552 | .086 | .142 |
| **Relevance** | | | | | | |
| Estimate | 0.06 | -1.32 | -0.26 | -0.04 | 0.04 | -0.13 |
| Standard Error | 0.27 | 0.43 | 0.19 | 0.13 | 0.01 | 0.38 |
| 95% CI | [-0.47, 0.58] | [-2.15, -0.49] | [-0.61, 0.10] | [-0.29, 0.21] | [0.01, 0.07] | [-0.87, 0.61] |
| *p*-value | .836 | **.002** | .165 | .739 | **.009** | .728 |
| Corrected *p*-value | .974 | **.015** | .397 | .974 | **.034** | .974 |
| **Judgments** | | | | | | |
| Estimate | 0.08 | 1.43 | -0.30 | -0.11 | 0.01 | -0.71 |
| Standard Error | 0.18 | 0.40 | 0.18 | 0.13 | 0.01 | 0.25 |
| 95% CI | [-0.28, 0.43] | [0.65, 2.20] | [-0.65, 0.05] | [-0.35, 0.14] | [-0.02, 0.04] | [-1.21, -0.22] |
| *p*-value | .667 | **<.001** | .106 | .410 | .447 | **.006** |
| Corrected *p*-value | .667 | **.003** | .212 | .536 | .536 | **.022** |
| **Loyalty** | | | | | | |
| **Main Score** | | | | | | |
| Estimate | -0.47 | -2.80 | -0.05 | -0.21 | 0.07 | 0.72 |
| Standard Error | 0.40 | 0.77 | 0.34 | 0.24 | 0.03 | 0.56 |
| 95% CI | [-1.25, 0.32] | [-4.27, -1.33] | [-0.71, 0.61] | [-0.67, 0.25] | [0.01, 0.12] | [-0.37, 1.82] |
| *p*-value | .244 | **<.001** | .887 | .378 | **.019** | .197 |
| Corrected *p*-value | .366 | **.002** | .887 | .504 | .058 | .366 |
| **Relevance** | | | | | | |
| Estimate | -0.40 | -3.36 | -0.07 | -0.15 | 0.04 | 0.77 |
| Standard Error | 0.30 | 0.46 | 0.19 | 0.14 | 0.02 | 0.42 |

| | Measurement | Country | Musical Education | Listening to Music | Empathy | Measurement * Country |
|---|---|---|---|---|---|---|
| 95% CI | [-0.99, 0.19] | [-4.23, -2.48] | [-0.44, 0.30] | [-0.41, 0.11] | [0.01, 0.07] | [-0.06, 1.59] |
| *p*-value | .186 | **<.001** | .716 | .269 | **.005** | .072 |
| Corrected *p*-value | .319 | **<.001** | .781 | .377 | **.020** | .173 |
| **Judgments** | | | | | | |
| Estimate | -0.11 | 0.59 | -0.01 | -0.07 | 0.02 | 0.00 |
| Standard Error | 0.21 | 0.49 | 0.22 | 0.16 | 0.02 | 0.30 |
| 95% CI | [-0.53, 0.31] | [-0.35, 1.52] | [-0.43, 0.42] | [-0.36, 0.23] | [-0.01, 0.05] | [-0.59, 0.59] |
| *p*-value | .605 | .231 | .981 | .673 | .252 | .991 |
| Corrected *p*-value | .898 | .604 | .991 | .898 | .604 | .991 |
| **Authority** | | | | | | |
| **Main Score** | | | | | | |
| Estimate | 0.09 | -1.49 | -0.05 | -0.16 | 0.04 | -0.15 |
| Standard Error | 0.40 | 0.70 | 0.31 | 0.22 | 0.02 | 0.56 |
| 95% CI | [-0.69, 0.87] | [-2.83, -0.15] | [-0.64. 0.54] | [-0.57, 0.25] | [-0.01, 0.09] | [-1.25, 0.94] |
| *p*-value | .824 | **.033** | .869 | .454 | .099 | .784 |
| Corrected *p*-value | .869 | .100 | .869 | .681 | .237 | .869 |
| **Relevance** | | | | | | |
| Estimate | -0.11 | -2.07 | -0.10 | -0.05 | 0.04 | 0.54 |
| Standard Error | 0.29 | 0.48 | 0.21 | 0.15 | 0.02 | 0.40 |
| 95% CI | [-0.67, 0.45] | [-2.98, -1.16] | [-0.49, 0.30] | [-0.33, 0.23] | [0.01, 0.07] | [-0.25, 1.33] |
| *p*-value | .699 | **<.001** | .643 | .725 | **.025** | .180 |
| Corrected *p*-value | .725 | **<.001** | .725 | .725 | .076 | .360 |
| **Judgments** | | | | | | |
| Estimate | 0.16 | 0.44 | 0.08 | -0.13 | 0.01 | -0.65 |
| Standard Error | 0.21 | 0.36 | 0.16 | 0.11 | 0.12 | 0.29 |
| 95% CI | [-0.25, 0.56] | [-0.26, 1.14] | [-0.22, 0.39] | [-0.34, 0.09] | [-0.02, 0.03] | [-1.21, -0.09] |
| *p*-value | .450 | .229 | .596 | .265 | .698 | **.025** |
| Corrected *p*-value | .600 | .392 | .650 | .397 | .698 | .076 |
| **Purity** | | | | | | |
| **Main Score** | | | | | | |
| Estimate | -0.28 | -3.65 | -0.57 | -0.16 | 0.05 | 0.22 |
| Standard Error | 0.37 | 0.84 | 0.38 | 0.27 | 0.03 | 0.52 |

| | Measurement | Country | Musical Education | Listening to Music | Empathy | Measurement * Country |
|---|---|---|---|---|---|---|
| 95% CI | [-1.00, 0.44] | [-5.25, -2.04] | [-1.30, 0.16] | [-0.68, 0.35] | [-0.01, 0.11] | [-0.79, 1.24] |
| *p*-value | .452 | **<.001** | .138 | .542 | .115 | .665 |
| Corrected *p*-value | .678 | **<.001** | .276 | .723 | .276 | .799 |
| **Relevance** | | | | | | |
| Estimate | -0.17 | -3.39 | -0.38 | -0.19 | 0.04 | 0.72 |
| Standard Error | 0.28 | 0.46 | 0.20 | 0.14 | 0.02 | 0.39 |
| 95% CI | [-0.71, 0.37] | [-4.28, -2.50] | [-0.77, 0.00] | [-0.46, 0.09] | [0.00, 0.07] | [-0.04, 1.47] |
| *p*-value | .546 | **<.001** | .059 | .191 | **.032** | .066 |
| Corrected *p*-value | .656 | **<.001** | .114 | .287 | .078 | .114 |
| **Judgments** | | | | | | |
| Estimate | -0.10 | -0.11 | -0.12 | -0.01 | 0.01 | -0.50 |
| Standard Error | 0.20 | 0.51 | 0.24 | 0.17 | 0.02 | 0.28 |
| 95% CI | [-0.49, 0.29] | [-1.09, 0.87] | [-0.57, 0.33] | [-0.32, 0.31] | [-0.03, 0.05] | [-1.04, 0.04] |
| *p*-value | .612 | .828 | .614 | .966 | .624 | .070 |
| Corrected *p*-value | .832 | .993 | .832 | .999 | .832 | .252 |

## Table 15

*Study 2a: Results of the Linear Mixed Model Analysis for Favorite Genres Covariates*

| | Smooth | Unpretentious | Sophisticated | Intense | Rhythmic |
|---|---|---|---|---|---|
| **Self-Importance of Moral Identity Symbolization** | | | | | |
| Estimate | 0.07 | 0.20 | 0.24 | -0.29 | 0.23 |
| Standard Error | 0.18 | 0.15 | 0.15 | 0.14 | 0.14 |
| 95% CI | [-0.27, 0.41] | [-0.08, 0.49] | [-0.05, 0.52] | [-0.56, -0.02] | [-0.03, 0.49] |
| *p*-value | .682 | .178 | .109 | **.040** | .087 |
| Corrected *p*-value | .818 | .289 | .219 | .121 | .210 |
| **Internalization** | | | | | |
| Estimate | 0.19 | 0.19 | 0.10 | -0.14 | 0.13 |
| Standard Error | 0.15 | 0.12 | 0.12 | 0.12 | 0.11 |

| | Smooth | Unpretentious | Sophisticated | Intense | Rhythmic |
|---|---|---|---|---|---|
| 95% CI | [-0.09, 0.48] | [-0.05, 0.42] | [-0.36, 0.09] | [-0.08, 0.35] | [-0.08, 0.35] |
| *p*-value | .199 | .138 | .411 | .242 | .244 |
| Corrected *p*-value | .419 | .414 | .510 | .419 | .419 |
| **Moral Foundations** | | | | | |
| **Care** | | | | | |
| **Main Score** | | | | | |
| Estimate | 0.38 | -0.07 | -0.07 | -0.14 | -0.03 |
| Standard Error | 0.18 | 0.15 | 0.15 | 0.14 | 0.14 |
| 95% CI | [0.03, 0.73] | [-0.36, 0.22] | [-0.35, 0.22] | [-0.41, 0.14] | [-0.30, 0.23] |
| *p*-value | **.040** | .642 | .658 | .338 | .810 |
| Corrected *p*-value | .161 | .718 | .718 | .517 | .810 |
| **Relevance** | | | | | |
| Estimate | 0.15 | 0.02 | 0.02 | -0.16 | -0.01 |
| Standard Error | 0.11 | 0.09 | 0.09 | 0.08 | 0.08 |
| 95% CI | [-0.05, 0.36] | [-0.15, 0.19] | [-0.15, 0.18] | [-0.31, 0.00] | [-0.17, 0.14] |
| *p*-value | .151 | .842 | .848 | .063 | .893 |
| Corrected *p*-value | .302 | .893 | .893 | .228 | .893 |
| **Judgments** | | | | | |
| Estimate | 0.22 | -0.07 | -0.07 | -0.01 | 0.00 |
| Standard Error | 0.12 | 0.10 | 0.10 | 0.10 | 0.09 |
| 95% CI | [-0.01, 0.46] | [-0.27, 0.12] | [-0.27, 0.12] | [-0.19, 0.18] | [-0.18, 0.18] |
| *p*-value | .071 | .468 | .472 | .937 | .973 |
| Corrected *p*-value | .214 | .662 | .662 | .973 | .973 |
| **Fairness** | | | | | |
| **Main Score** | | | | | |
| Estimate | 0.49 | 0.15 | -0.13 | -0.32 | 0.05 |
| Standard Error | 0.20 | 0.16 | 0.16 | 0.15 | 0.15 |
| 95% CI | [0.12, 0.87] | [-0.16, 0.47] | [-0.44, 0.18] | [-0.61, -0.02] | [-0.23, 0.33] |
| *p*-value | **.012** | .342 | .414 | **.040** | .735 |
| Corrected *p*-value | .073 | .552 | .552 | .121 | .802 |
| **Relevance** | | | | | |
| Estimate | 0.24 | 0.09 | 0.00 | -0.08 | -0.01 |
| Standard Error | 0.12 | 0.10 | 0.10 | 0.10 | 0.09 |

| | Smooth | Unpretentious | Sophisticated | Intense | Rhythmic |
|---|---|---|---|---|---|
| 95% CI | [0.01, 0.47] | [-0.11, 0.28] | [-0.19, 0.20] | [-0.27, 0.10] | [-0.19, 0.17] |
| *p*-value | .052 | .395 | .977 | .375 | .893 |
| Corrected *p*-value | .155 | .678 | .977 | .678 | .974 |
| **Judgments** | | | | | |
| Estimate | 0.24 | 0.12 | -0.13 | -0.20 | 0.04 |
| Standard Error | 0.12 | 0.10 | 0.10 | 0.09 | 0.09 |
| 95% CI | [0.01, 0.47] | [-0.07, 0.31] | [-0.32, 0.06] | [-0.38, -0.02] | [-0.13, 0.22] |
| *p*-value | **.046** | .231 | .191 | **.036** | .635 |
| Corrected *p*-value | .109 | .347 | .327 | .107 | .667 |
| **Loyalty** | | | | | |
| **Main Score** | | | | | |
| Estimate | 0.37 | 0.23 | 0.07 | -0.55 | 0.13 |
| Standard Error | 0.23 | 0.19 | 0.19 | 0.18 | 0.17 |
| 95% CI | [-0.06, 0.80] | [-0.13, 0.59] | [-0.28, 0.43] | [-0.88, -0.21] | [-0.20, 0.46] |
| *p*-value | .104 | .216 | .701 | **.002** | .458 |
| Corrected *p*-value | .250 | .366 | .764 | **.009** | .549 |
| **Relevance** | | | | | |
| Estimate | 0.25 | 0.11 | 0.11 | -0.16 | 0.01 |
| Standard Error | 0.13 | 0.11 | 0.11 | 0.10 | 0.10 |
| 95% CI | [0.01, 0.50] | [-0.09, 0.32] | [-0.10, 0.31] | [-0.35, 0.03] | [-0.18, 0.19] |
| *p*-value | .051 | .292 | .314 | .118 | .958 |
| Corrected *p*-value | .154 | .377 | .377 | .235 | .958 |
| **Judgments** | | | | | |
| Estimate | 0.08 | 0.15 | -0.01 | -0.37 | 0.11 |
| Standard Error | 0.15 | 0.12 | 0.12 | 0.11 | 0.11 |
| 95% CI | [-0.20, 0.36] | [-0.09, 0.38] | [-0.24, 0.22] | [-0.59, -0.15] | [-0.10, 0.32] |
| *p*-value | .586 | .235 | .945 | **.001** | .329 |
| Corrected *p*-value | .898 | .604 | .991 | **.009** | .657 |
| **Authority** | | | | | |
| **Main Score** | | | | | |
| Estimate | 0.55 | 0.22 | 0.06 | -0.39 | 0.23 |
| Standard Error | 0.20 | 0.17 | 0.17 | 0.16 | 0.15 |
| 95% CI | [0.16, 0.94] | [-0.10, 0.54] | [-0.26, 0.38] | [-0.70, -0.09] | [-0.07, 0.52] |
| *p*-value | **.007** | .195 | .728 | **.013** | .143 |

| | Smooth | Unpretentious | Sophisticated | Intense | Rhythmic |
|---|---|---|---|---|---|
| Corrected *p*-value | **.042** | .333 | .869 | .053 | .286 |
| **Relevance** | | | | | |
| Estimate | 0.38 | 0.05 | 0.13 | -0.16 | 0.09 |
| Standard Error | 0.14 | 0.11 | 0.11 | 0.11 | 0.10 |
| 95% CI | [0.12, 0.64] | [-0.17, 0.27] | [-0.08, 0.35] | [-0.36, 0.04] | [-0.11, 0.29] |
| *p*-value | **.006** | .652 | .245 | .131 | .371 |
| Corrected *p*-value | **.023** | .725 | .420 | .314 | .556 |
| **Judgments** | | | | | |
| Estimate | 0.18 | 0.15 | -0.05 | -0.30 | 0.19 |
| Standard Error | 0.11 | 0.09 | 0.09 | 0.08 | 0.08 |
| 95% CI | [-0.02, 0.38] | [-0.02, 0.31] | [-0.21, 0.12] | [-0.46, -0.14] | [0.04, 0.35] |
| *p*-value | .086 | .099 | .595 | **<.001** | **.017** |
| Corrected *p*-value | .199 | .199 | .650 | **.002** | .069 |
| **Purity** | | | | | |
| **Main Score** | | | | | |
| Estimate | 0.59 | 0.01 | -0.00 | -0.57 | 0.19 |
| Standard Error | 0.25 | 0.21 | 0.21 | 0.20 | 0.19 |
| 95% CI | [0.11, 1.07] | [-0.39, 0.41] | [-0.40, 0.39] | [-0.95, -0.19] | [-0.18, 0.56] |
| *p*-value | **.019** | .966 | .981 | **.004** | .319 |
| Corrected *p*-value | .058 | .981 | .981 | **.017** | .547 |
| **Relevance** | | | | | |
| Estimate | 0.35 | 0.03 | 0.11 | -0.28 | 0.02 |
| Standard Error | 0.13 | 0.11 | 0.11 | 0.10 | 0.10 |
| 95% CI | [0.10, 0.61] | [-0.19, 0.24] | [-0.10, 0.32] | [-0.48, -0.08] | [-0.17, 0.22] |
| *p*-value | **.008** | .813 | .331 | **.007** | .824 |
| Corrected *p*-value | **.025** | .824 | .442 | **.025** | .824 |
| **Judgments** | | | | | |
| Estimate | 0.22 | 0.00 | -0.09 | -0.30 | 0.20 |
| Standard Error | 0.16 | 0.13 | 0.13 | 0.12 | 0.12 |
| 95% CI | [-0.08, 0.52] | [-0.25. 0.25] | [-0.33, 0.16] | [-0.53, -0.06] | [-0.02, 0.43] |
| *p*-value | .158 | .999 | .498 | **.015** | .084 |
| Corrected *p*-value | .380 | .999 | .832 | .093 | .252 |

The level of musical education and time spent listening to music were not significant predictors across all models. Empathy increased the internalization of the self-importance of moral identity and the relevance of fairness and loyalty. Preference for smooth music genres increased the level of a general preference for authority and the relevance of authority and purity, whereas preference for intense music genres decreased the level of a general preference for loyalty and purity, the relevance of purity, and judgments about loyalty and authority. Covariates related to music did not affect the significance of the fairness judgments subscale of the MFQ, suggesting that this model does not fully account for the observed effect.

### 6.2.3. Discussion

In Study 2a, I tested how listening to a happy piece of music influenced participants' self-importance of moral identity and moral foundations. I observed that music increased positive affect, which confirms H1. Moreover, happy music lowered the negative affect, with a stronger effect on Chinese participants.

I did not confirm H2. I found no differences between variables (pre-test and post-test) regarding the moral foundations. This means that listening to happy music did not change how all participants considered their moral foundations. However, I did find the interaction between measurement and country regarding judgments about foundations of fairness. This result means that after listening to the happy music, Chinese participants judged fairness less favorably than before listening to the music. So why only Chinese participants were impacted by music, and why only fairness foundations? There are two potential explanations.

First, from past research, we know that Eastern and Western cultures differ in many ways, such as individualism, distance to power, uncertainty avoidance, long-term orientation, or indulgence (Minkov & Kaasa, 2022). There are also specific differences

in moral reasoning (see the review: Bentahila et al., 2021). In Chinese culture, fairness is tied to maintaining social harmony, while in the USA, fairness emphasizes individual rights and autonomy. There are also differences in experiencing emotions (e.g., Davis et al., 2012; Lim, 2016). In Eastern cultures like China, negative-valence emotions are more appreciated (Tsai et al., 2007) and experienced more socially, emphasizing harmony and cohesion (Karandashev, 2021). This may explain the much higher baseline level of negative affect among Chinese compared to Americans. This also could make Chinese participants more sensitive to emotional stimuli like music, which might influence their attitudes to fairness. In contrast, Western cultures like the USA prioritize personal needs and emotional self-expression (Cohen & Gunz, 2002). In such cultures, moral decisions may be more stable and less influenced by temporary emotional states because individuals prioritize their personal values and autonomy, which can act as a buffer against external emotional stimuli (Koydemir & Essau, 2017). However, we need more studies explaining the potential mechanisms behind observed differences.

Second, the music's specific impact on fairness among Chinese participants might relate to its cultural and contextual features. Composed by a Western artist using Western scales, the piece was used in the Hollywood film *Pride & Prejudice*. This likely made it more familiar and emotionally resonant for American participants, fitting their cultural expectations. For Chinese participants, however, the music may have felt foreign, affecting how they processed it emotionally and cognitively. Research shows that familiarity with music influences how it is experienced, with unfamiliar music often leading to less engagement or different emotional reactions (Heng et al., 2021). This aligns with the mere-exposure effect (Zajonc, 1968), which also applies to music (Green et al., 2012). Moreover, maybe similarly to the moral foreign language effect (Białek et al., 2019), people may process foreign music differently than native music. However, it

is too early to draw strong conclusions about the emotional connotations of the stimuli used. We need more studies to explain the potential mechanisms behind the observed effects.

I did not confirm H3; the music did not influence the self-importance of moral identity. This could be because moral identity is more stable than moral judgments (Bäker, 2024; Krettenauer et al., 2022), as it is an ingrained part of who someone is. It is less likely that its importance may be influenced by short-term changes caused by things like music. So, while music can change how people feel in the moment, it might not be enough to alter something as fundamental as moral identity and its importance to participants. This null result is consistent with a study on manipulating moral identity by drinking alcohol (Paruzel-Czachura et al., 2024).

I also observed country differences in almost all tested variables. For Americans, it was more important to feel like a moral person (higher internalization). This result aligns with previous research on moral identity across more than 60 countries (Paruzel-Czachura & McHugh, 2024). Regarding the main scores in moral foundations, American participants had higher care, loyalty, and purity than Chinese participants. Regarding the relevance subscale, all foundations were more relevant for Americans than Chinese. Regarding the judgments subscale, care was more important for Americans, whereas fairness was more important for the Chinese. This result is inconsistent with a previous study (Clancy & Hohberger, 2019), which showed that Chinese participants valued the foundations of loyalty, authority, and purity more than participants from Western cultures. However, while I studied the general population, this study focused only on engineering bilingual students at the American university in China. So, the results may not be representative of Chinese citizens. We need more cross-cultural studies in this area.

Empathy increased the internalization of the self-importance of moral identity and the relevance of fairness and loyalty, which suggests that for empathic participants, it was more important to be moral, and also to be fair and loyal. These findings are in line with previous studies (e.g., Dawson et al., 2021; Strupp-Levitsky et al., 2020).

Musical preferences for smooth genres were associated with an increase in certain moral foundations (general preference for authority and the relevance of authority and purity), whereas preferences for intense music were linked to a decrease in moral foundations (general preference for loyalty and purity, the relevance of purity, and judgments about loyalty and authority). This decline may be related to aspects discussed by Lozon and Bensimon (2014), who suggested that preferences for "problematic genres" such as hip-hop, techno, or heavy metal may be associated with antisocial behaviors and substance abuse. Findings from this study suggest that such preferences may also be linked to a lower valuation of some moral foundations.

### 6.3. Study 2b

As I found an effect of listening to happy music on the judgments subscale of MFQ among Chinese participants but not American participants, I aimed to test whether this effect was driven only by affect (and the music piece was just a stimulus that smoothly evoked it) or if there was something special about the music itself. In other words, I wanted to test whether the effect was driven solely by emotions or the musical track that evoked it.

To achieve this, I needed to find a stimulus that would be as similar as possible to the musical piece from the previous study. According to previous research, visual stimuli are the most effective in evoking emotions (e.g., Dhaka & Kashyap, 2017; Siedlecka & Denson, 2019). I used the Open Affective Standardized Image Set (OASIS; Kurdi et al., 2017) to choose the appropriate image. I used the same criteria as for the piece of music

in terms of valence and arousal, and I chose the image that was high on both scales and had no cultural bias (as that could be with pictures presenting, e.g., people of a particular race). I chose the image of the puppy dog sitting in the mug on the lawn ($M$ = 6.5 on a scale of 7 for valence and $M$ = 5.0 for arousal; Figure 4).

**Figure 4**

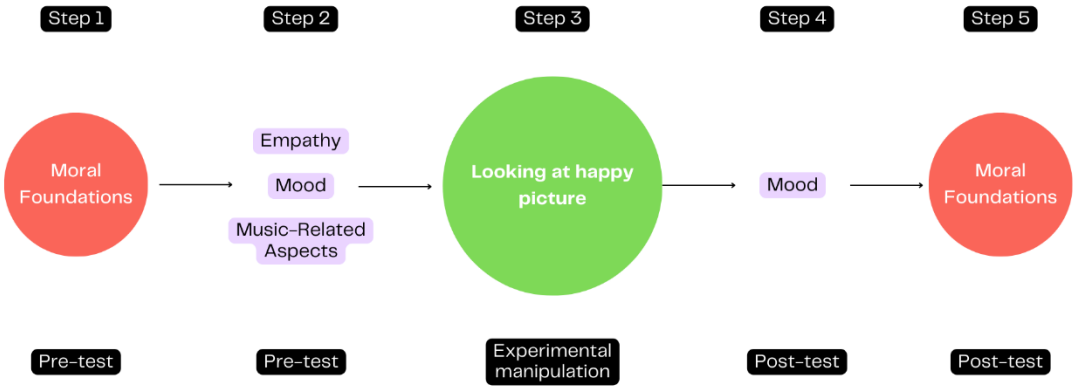
*The Picture Used as a Visual Stimuli in Study 2b*

*Note*. Picture Dog 6; OASIS database by Kurdi et al. 2017.

I predicted that the picture would influence participants in the same way as a musical piece: lower negative affect (H1) but not influence positive affect (H2) and make participants agree less with the judgments subscale of MFQ (H3).

**Figure 5**

*The Graphic Representation of Study 2b Design*




### 6.3.1. Methods

#### 6.3.1.1. Participants

Because I found an effect only among Chinese participants, I conducted Study 2b only among Chinese participants. I aimed to collect a similar sample size, $N = 90$. My final sample was $N = 101$ participants ($n = 52$ women). The recruitment rules were the same as in Study 2a. The average age of participants was $M = 23.3$ ($SD = 3.9$); most of them were nonreligious ($n = 77$); however, among religious participants, the most popular religion was Buddhism ($n = 14$). They were slightly more conservative ($M = 4.0$, $SD = 1.5$ on a 7-point liberal-conservative scale).

#### 6.3.1.2. Procedure

The procedure of Study 2b was the same as the procedure of Study 2a. However, this time, participants filled out a questionnaire only with judgments subscale of MFQ and did not have questions about moral identity. Moreover, I did not use musical stimuli but asked participants to carefully look at the picture for some time to notice all the details (see Figure 4). As an attention check, after looking at the picture, I asked participants what was on the picture. Then, participants answered the same additional questions as in

Study 2a. This survey was shorter, and the time needed was approximately 10 minutes, 5 per part. I also asked participants whether their answers were honest and whether I should include them in the final analysis (yes/ no). One participant answered "no" and was excluded from statistical analyses.

#### 6.3.1.3. Measures

See descriptions from Study 2a.

### 6.3.2. Results

#### 6.3.2.1. Manipulation Check

Table 16 shows the descriptive statistics and the results of the LMM of negative and positive affects as fixed factors and measurement as a within-subject, e.g., positive_affect ~ measurement + (1 | ID).

**Table 16**

*Study 2b: Descriptive Statistics and Results of the Linear Mixed Model Analysis for the Manipulation Check*

| | Pre-test *M* (*SD*) | Post-test *M* (*SD*) | Estimate | Standard Error | 95% CI | *p*-value | Corrected *p*-value |
|---|---|---|---|---|---|---|---|
| Positive Affect | 32.6 (7.3) | 32.0 (7.5) | -0.66 | 0.36 | [-1.38, 0.05] | .072 | .072 |
| Negative Affect | 21.1 (7.5) | 19.5 (7.8) | -1.53 | 0.37 | [-2.27, -0.82] | < **.001** | < **.001** |

Similar to Study 2a, the effect among the Chinese participants was observed only for negative affect – experimental manipulation (viewing the picture) reduced negative affect, while positive affect remained stable.

#### 6.3.2.2. Main Analyses

I tested the change in the judgments subscale of MFQ after looking at the picture. In Table 17, I show the descriptive statistics and the results of the LMM. I included judgments of moral foundations as fixed factors, measurement as a within-subject, and

participants' ID as a random effect, e.g., care_judge ~ measurement + (1 | ID). None of the results reached statistical significance.

**Table 17**

*Study 2b: Descriptive Statistics and Results of the Linear Mixed Model Analysis for the Judgments Subscale of MFQ*

| | Pre-test *M* (*SD*) | Post-test *M* (*SD*) | Estimate | Standard Error | 95% CI | *p*-value | Corrected *p*-value |
|---|---|---|---|---|---|---|---|
| Care | 8.5 (2.7) | 8.5 (2.5) | 0.04 | 0.23 | [-0.41, 0.49] | .862 | .862 |
| Fairness | 11.8 (2.1) | 11.5 (2.1) | -0.28 | 0.19 | [-0.65, 0.10] | .150 | .150 |
| Loyalty | 10.1 (2.5) | 10.0 (2.7) | -0.03 | 0.21 | [-0.44, 0.38] | .887 | .887 |
| Authority | 10.5 (2.5) | 10.3 (2.0) | -0.15 | 0.22 | [-0.57, 0.27] | .491 | .491 |
| Purity | 10.4 (3.1) | 10.2 (2.9) | -0.21 | 0.21 | [-0.62, 0.20] | .322 | .322 |

### 6.3.1.3. Covariates

As in Study 2a, I also tested all potential covariates. There was no strong collinearity between covariates (Table 18), so I conducted LMM with them as random effects (Table 19).

**Table 18**

*Study 2b: Correlations Between Covariates*

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. |
|---|---|---|---|---|---|---|---|---|
| 1. Musical Education | - | | | | | | | |
| 2. Favorite Genre: Smooth | .14 | - | | | | | | |
| 3. Favorite Genre: Unpretentious | .06 | .19 | - | | | | | |
| 4. Favorite Genre: Sophisticated | .21 | .31 | .00 | - | | | | |
| 5. Favorite Genre: Intense | .13 | .18 | .05 | .36 | - | | | |
| 6. Favorite Genre: Rhythmic | .04 | .10 | -.02 | .02 | .37 | - | | |
| 7. Listening to Music | .17 | .22 | .06 | -.01 | .37 | .39 | - | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 8. Empathy | .07 | .31 | .04 | .11 | .20 | .22 | .22 | - |

**Table 19**

*Study 2b: Results of the Linear Mixed Model Analysis for Covariates*

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. |
|---|---|---|---|---|---|---|---|---|---|
| **Care** | | | | | | | | | |
| Estimate | 0.04 | 0.33 | 0.03 | -0.02 | -0.20 | -0.10 | 0.22 | 0.29 | 0.03 |
| Standard Error | 0.23 | 0.22 | 0.18 | 0.14 | 0.14 | 0.17 | 0.15 | 0.18 | 0.02 |
| 95% CI | [-0.41, 0.49] | [-0.08, 0.75] | [-0.32, 0.37] | [-0.29, 0.25] | [-0.47, 0.07] | [-0.41, 0.22] | [-0.07, 0.51] | [-0.05, 0.64] | [-0.00, 0.07] |
| *p*-value | .862 | .135 | .891 | .890 | .167 | .564 | .161 | .114 | .075 |
| Corrected *p*-value | .891 | .278 | .891 | .891 | .278 | .806 | .278 | .278 | .278 |
| **Fairness** | | | | | | | | | |
| Estimate | -0.28 | 0.01 | -0.09 | 0.06 | -0.10 | -0.33 | 0.22 | 0.09 | 0.04 |
| Standard Error | 0.19 | 0.17 | 0.14 | 0.11 | 0.11 | 0.13 | 0.12 | 0.14 | 0.01 |
| 95% CI | [-0.65, 0.10] | [-0.31, 0.33] | [-0.36, 0.17] | [-0.15, 0.26] | [-0.31, 0.11] | [-0.57, -0.09] | [-0.00, 0.44] | [-0.18, 0.35] | [0.01, 0.07] |
| *p*-value | .150 | .959 | .511 | .593 | .363 | **.011** | .066 | .534 | **.006** |
| Corrected *p*-value | .299 | .959 | .659 | .659 | .605 | **.038** | .165 | .659 | **.029** |
| **Loyalty** | | | | | | | | | |
| Estimate | -0.03 | 0.17 | -0.28 | 0.21 | -0.16 | -0.08 | 0.33 | 0.17 | 0.06 |
| Standard Error | 0.21 | 0.21 | 0.18 | 0.14 | 0.14 | 0.16 | 0.15 | 0.18 | 0.02 |
| 95% CI | [-0.44, 0.38] | [-0.23, 0.57] | [-0.61, 0.05] | [-0.05, 0.46] | [-0.42, 0.10] | [-0.38, 0.23] | [0.05, 0.61] | [-0.16, 0.50] | [0.03, 0.09] |
| *p*-value | .887 | .425 | .118 | .130 | .236 | .628 | **.027** | .332 | **.001** |
| Corrected *p*-value | .887 | .531 | .259 | .259 | .393 | .698 | .089 | .475 | **.005** |
| **Authority** | | | | | | | | | |
| Estimate | -0.15 | 0.12 | -0.06 | 0.13 | -0.08 | -0.27 | 0.23 | 0.18 | 0.05 |
| Standard Error | 0.21 | 0.17 | 0.15 | 0.11 | 0.12 | 0.14 | 0.12 | 0.15 | 0.02 |
| 95% CI | [-0.57, 0.27] | [-0.21, 0.46] | [-0.34, 0.22] | [-0.09, 0.35] | [-0.30, 0.14] | [-0.52, -0.01] | [-0.00, 0.47] | [-0.10, 0.46] | [0.02, 0.08] |
| *p*-value | .491 | .486 | .688 | .256 | .514 | .052 | .065 | .231 | **.002** |

| | 1. | 2. | 3. | 4. | 5. | 6. | 7. | 8. | 9. |
|---|---|---|---|---|---|---|---|---|---|
| Corrected *p*-value | .571 | .571 | .688 | .427 | .571 | .164 | .164 | .427 | **.010** |
| **Purity** | | | | | | | | | |
| Estimate | -0.21 | -0.02 | -0.28 | 0.31 | -0.30 | -0.16 | 0.44 | 0.43 | 0.04 |
| Standard Error | 0.21 | 0.25 | 0.21 | 0.16 | 0.16 | 0.19 | 0.17 | 0.21 | 0.02 |
| 95% CI | [-0.62, 0.20] | [-0.49, 0.45] | [-0.67, 0.11] | [0.01, 0.61] | [-0.61, 0.00] | [-0.52, 0.20] | [0.11, 0.77] | [0.04, 0.82] | [0.00, 0.08] |
| *p*-value | .322 | .946 | .180 | .054 | .064 | .410 | **.014** | **.042** | .055 |
| Corrected *p*-value | .402 | .946 | .257 | .106 | .106 | .456 | .068 | .106 | .106 |

*Note.* 1 = Measurement, 2 = Musical Education, 3 = Favorite Genre: Smooth, 4 = Favorite Genre: Unpretentious, 5 = Favorite Genre: Sophisticated, 6 = Favorite Genre: Intense, 7 = Favorite Genre: Rhythmic, 8 = Listening to Music, 9 = Empathy.

The level of music education and time spent attentively listening to music were not significant predictors across all models. Empathy increased the level of judgments about fairness, loyalty, and authority. Preferences for intense music genres decreased the level of judgments about fairness.

### 6.3.2. Discussion

In Study 2b, I aimed to test whether using a different stimulus than music, but with the same parameters on the valence and arousal scales, would produce the same effect as in Study 2a, where music influenced the weakening of judgment of fairness and authority. The experimental manipulation in the form of presenting an image caused the Chinese participants to react in the same way in terms of mood as after listening to a cheerful song: their negative affect decreased, and their positive affect remained unchanged. This confirmed predictions H1 and H2.

However, despite the same emotional impact, the image did not affect the participants' judgments of moral foundations in any way. Thus, I did not confirm H3.

Therefore, it can be concluded that despite having a similar impact on the participants' mood, music acts in a somewhat different way than an image, which is in line with previous research that emotions elicited by music make a different impact than the same emotions elicited by any other stimuli (e.g., Logeswaran & Bhattacharya, 2009; Scherer & Zentner, 2008). Why does music impact people differently than visual stimuli? One potential explanation may be the effect of exposition (Zajonc, 1968), while there is a higher probability that here, participants knew the song better than the used visual stimuli. I aimed to test this possibility in the last study.

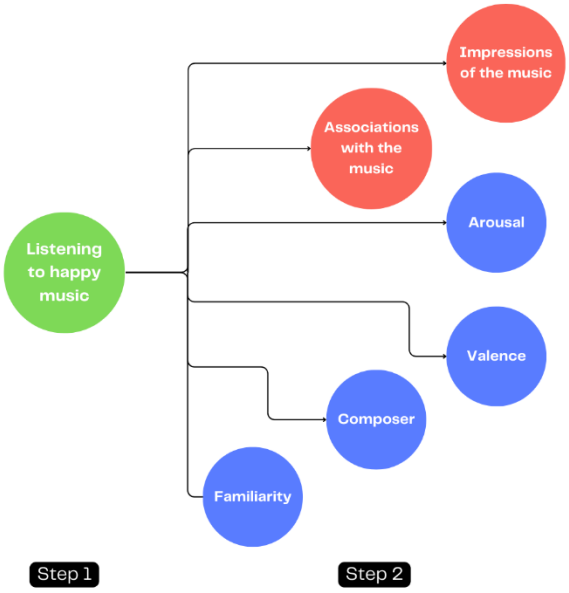
Regarding the connections between covariates of intense musical genres and empathy with moral foundations, the direction of results was similar as in Study 2a; however, with slightly different foundations involved – empathy increased judgments about fairness, loyalty, and authority, whereas preference for intense musical genres decreased judgments about fairness foundation.

### 6.4. Study 2c

Because I found an effect of listening to happy music on judgments about fairness foundations only among Chinese participants and not Americans (Study 2a), and that effect was driven solely by the music itself, not by visual stimuli (Study 2b), I aimed to test the differences in the cultural connotations of music perception between participants from both countries. I conducted Study 2c and asked open questions about impressions and associations with the piece of music. I also asked participants about perceived valence, arousal, and familiarity with the piece of music, as well as their feelings about this piece of music being composed by a Western or Eastern composer. I did not state any hypotheses as I treated this study as exploratory.

**Figure 6**

*The Graphic Representation of Study 2c Design*




### 6.4.1. Methods

#### 6.4.1.3. Participants

I preregistered a sample size of $N$ = 102, $n$ = 51 participants per country, counted in G*power software for t-tests; Means: Difference between two independent means (two groups), two tails, 80% of power, with a margin of error of $\alpha$ = .05, and the medium effect size 0.5.

Participants were recruited via the Prolific platform in the USA and the Credamo platform in China, must have provided informed consent, and must have been over 18 years old. I gathered $n$ = 51 in the USA ($n$ = 21 women) and $n$ = 53 in China ($n$ = 36 women), a total of $N$ = 104 ($n$ = 57 women). I examined Americans and Chinese separately, and all participants saw the online survey in their native languages. The average age of participants was $M$ = 33.8 ($SD$ = 9.6) in the USA and $M$ = 29.3 ($SD$ = 8.4) in China. All Americans had an American cultural background, and all Chinese had a Chinese cultural background.

#### 6.4.1.4. Procedure

First, participants answered demographic questions about gender, age, and cultural background. Next, they listened to the piece of music (the same as used in Study 2a): a 1-minute excerpt from *Pride & Prejudice* from an open database (Vuoskoski & Eerola, 2012) previously rated as high on valence and arousal, unfamiliar to listeners. Next, participants wrote down their associations (i.e., memories, scenes, moments, people) and impressions (i.e., immediate thoughts and feelings) about the piece of music in their native language (i.e., English or Chinese). Then, participants answered whether they thought that the music piece was composed by a Western or an Eastern composer. Finally, I asked about liking the song, previous familiarity with the song, perceived valence, and arousal. The survey took approximately 5 minutes. I used one attention check during this survey, and the task was the same as in Study 2a: to write down the three-digit number that the lector spoke during the song. Writing down two out of three digits was counted as correct. Otherwise, the whole record from that participant was withdrawn from analyses. However, every tested participant passed this attention check.

#### 6.4.1.5. Measures

**Associations and Impressions.** The questions were as follows: "What are your associations with this piece of music? (i.e., memories, scenes, moments, people, etc. evoked by the music)" and "What are your impressions while listening to this piece of music? (i.e., immediate thoughts and feelings)". There were no word limits for the answers.

**Compositor.** Additionally, I asked whether participants could tell if the presented piece of music was composed by a Western or an Eastern composer: "Can you tell if this piece of music was composed rather by an Eastern or Western composer? (note that Eastern refers to Asian countries excluding the Westernized countries in the East)". Participants answered this question by choosing one option*: definitely a Western*

*composer/ probably a Wester composer/ I can't tell/ probably an Eastern composer/ definitely an Eastern composer*.

**Other.** I also asked about liking the piece of music and previous familiarity with the song (with answers on a scale from 1 = *very slightly or not at all* to 5 = *extremely*), perceived arousal (with answers on a scale from 1 = *very calm* to 5 = *very arousing*), and valence (with answers on a scale from 1 = *very negative* to 5 = *very positive*). As for demographic questions, I asked about participants' gender, age, and cultural background.

### 6.4.2. Results

First, I analyzed qualitative data on participants' impressions and associations with the piece of music. Three expert judges categorized participants' responses into one of six predefined categories: (1) emotions and feelings (e.g., "It feels very traditional, it evokes feeling of a better, happier time. It evokes feeling of some countryside, something Anglo-feeling."), (2) memories (e.g., "Very good reminder of my dad."), (3) events (e.g., "I think of a ball in a grand, luxurious hall, where everyone is dancing together to the music."), (4) nature and places (e.g., "Camping in the wild, with adults and children dancing together."), (5) media and culture (e.g., "It reminds me of the concert scenes in "Tom and Jerry" cartoons."), or (6) other (e.g., "Children growing up happily with my company!"). These categories were applied separately to associations and impressions.

For associations, responses from Americans were most frequently categorized as *media and culture* (21 responses) and *events* (12 responses). In contrast, responses from Chinese participants were predominantly categorized as *events* (26 responses) and *memories* (9 responses). I conducted an analysis to compare the category associations between countries. The distribution was not normal, as determined by the Shapiro-Wilk test. Therefore, I performed the Wilcoxon rank sum test, which revealed a significant difference between countries ($W = 1644$, adjusted $p = .049$). This suggests a difference in

the distribution of category associations with the music between the countries, with a small effect size ($r$ = .06).

Regarding impressions, responses from both American and Chinese participants were most commonly categorized under *emotions and feelings* (36 responses among Americans and 51 among Chinese). Notably, nearly all Chinese responses were categorized as *emotions and feelings*, with only one response each in *media and culture* and *other*. In contrast, responses from Americans were more diverse across categories. I also conducted an analysis to compare the category impressions between countries. The Wilcoxon rank sum test, given the non-normal distribution, revealed a significant difference between the countries ($W$ = 1689.5, adjusted $p$ = .002). This suggests that the distribution of category impressions regarding the musical piece differs between the two countries, with a slightly larger but still small effect size ($r$ = .11).

Regarding response length, on average, Americans used $M$ = 20.4 words for associations ($SD$ = 17.8), compared to $M$ = 8.6 ($SD$ = 7.01) words among Chinese participants. Similarly, Americans used an average of $M$ = 13.2 ($SD$ = 12.3) words to describe impressions, while Chinese participants averaged only $M$ = 4.7 ($SD$ = 4.9) words. Both associations ($W$ = 1979.5, adjusted $p$ < .001, $r$ = .13) and impressions ($W$ = 2065.6, adjusted $p$ < .001, $r$ = .15) differed significantly but with a small effect size.

Regarding the composer's nationality, $n$ = 40 Americans and $n$ = 42 Chinese thought that the piece of music was definitely or probably composed by a Western composer. There were no differences between both countries regarding this variable ($W$ = 1190.5; adjusted $p$ = .253).

Next, I observed descriptive data on the musical piece's liking, familiarity, arousal, and valence. Then, since the distribution was not normal, I conducted a Wilcoxon analysis (Table 20).

**Table 20**

*Study 2c: Descriptive Statistics and Results of Wilcoxon Analysis*

| | Americans *M (SD)** | Chinese *M (SD)** | *W* | *p*-value | Adjusted *p*-value | *r* |
|---|---|---|---|---|---|---|
| Liking | 4.0 (1.1) | 3.5 (0.8) | 1763.5 | **.005** | **.010** | .09 |
| Familiarity | 3.7 (1.1) | 2.2 (0.8) | 2287.5 | < **.001** | < **.001** | .20 |
| Arousal | 3.5 (1.2) | 4.0 (0.7) | 1061.0 | **.031** | **.037** | .07 |
| Valence | 4.5 (0.9) | 4.3 (0.5) | 1718.5 | **.007** | **.010** | .09 |

*Note.* * min = 1; max = 5.

Americans showed a stronger preference for music and found it more familiar; they also rated the music more positively in terms of its valence. However, Chinese participants found it more arousal.

### 6.4.3. Discussion

When looking for potential interpretations of results from Studies 2a and 2b, I decided to run Study 2c. Here, I aimed to explore how Americans and Chinese differ in their perception of the piece of music used as stimuli in Study 2a. There were differences in the categories used by Americans and Chinese to describe their associations with the piece of music. Americans more frequently referred to media and culture, while Chinese participants focused more on events. Both groups mentioned emotions frequently in response to the impressions question, though this may have been influenced by the question's phrasing, which could encourage discussions about emotions. Regarding associations and impressions, both countries differed from each other, suggesting that the musical piece was perceived significantly different by the participants from the two countries. Additionally, Americans provided significantly longer responses to both open-ended questions. This aligns with prior research showing that Americans tend to disclose more information across various topics and to different audiences than Chinese individuals (Chen et al., 1995). Moreover, Chinese speakers have been found to use

significantly fewer syllables to convey the same information compared to English speakers, leading to faster speech initiation and overall communication efficiency (Latash et al., 2011).

There were also differences in the quantitative data collected in this study. While the music piece used in the main study by Vuoskoski and Eerola (2012) was described by Finnish participants as unfamiliar, American participants in this study were moderately familiar with it (averaging 3.7 on a 5-point scale) and also more familiar with it than Chinese participants (with medium effect size). This is likely because the piece was taken from the Hollywood movie *Pride & Prejudice*, making it more recognizable to Americans. Americans also expressed a greater liking for the song, which may be linked to familiarity, as previous research suggests that people tend to prefer music they recognize (Green et al., 2012). Consistent with the findings of the original study by Vuoskoski and Eerola (2012), both American and Chinese participants described the music piece as having high valence. However, Americans rated the piece slightly higher in valence, with a small effect size, whereas Chinese were more aroused by it, also with a small effect size.

Given that the most significant difference lies in the song itself, especially in the familiarity, I suspect this could be a key potential factor driving the perceived differences in Study 2a. In the discussion following Study 2a, I considered two possible explanations for the observed effect: cultural differences and the musical stimulus used. In light of the familiarity, liking, valence, and arousal results from Study 2c, it appears that the musical piece itself might play a crucial role. The piece was significantly more familiar to American participants, which likely influenced their responses and how they processed the music. Familiarity with music is a crucial factor in shaping emotional and cognitive reactions (Heng et al., 2021). The mere-exposure effect (Zajonc, 1968) suggests that

repeated exposure to a stimulus increased its appeal. For American participants, the familiarity of the piece may have amplified positive perceived valence and higher liking of the song and aligned with their cultural expectations. In contrast, for Chinese participants, the music, being culturally foreign, might have been more challenging to interpret, as they also perceived it as more arousal.

However, I also found cultural differences in the perception of music, although with a smaller effect size than in the familiarity variable. This suggests that while cultural differences in perception are important, the musical stimulus itself – the happy piece of music – seemed to have a larger impact in my study. Nevertheless, cultural differences cannot be ignored. To better understand these effects in the future, further research could explore the role of different musical genres, include a wider variety of cultural contexts, or use more diverse musical stimuli to test how different types of music influence perception across cultures.

### 6.5. Study 2: General Discussion

In Study 2, I investigated how a piece of happy music influences moral identity and foundations, focusing on two countries: the USA and China. Study 2a revealed that listening to happy music did not change how all participants evaluated the importance of being a good person. However, it led Chinese participants to judge the moral foundations of fairness less favorably, while Americans remained unaffected by music. Study 2b showed that this effect was not driven by mood, so I concluded that either the music itself or the cultural context was specific enough to change Chinese participants. While much of the previous research has focused on mood as the primary way music affects people, Study 2b suggests this may not be the case. Study 2c revealed cultural differences in associations and impressions related to the piece of music, as well as differences in perception of the stimulus itself. The music used was more familiar to American

participants, who also liked it more and rated it higher in valence than Chinese participants, who, in turn, rated the piece as more arousing. The largest effect was related to familiarity, suggesting that it might be a key factor in the results from Study 2a. For example, would Americans respond similarly to less familiar songs? Would Chinese participants be similarly influenced by familiar songs? More importantly, would the effect persist if different songs were tested to control for potential influences such as familiarity, liking, and other aspects of the stimulus itself? Future studies should address these questions to further clarify the role of these factors.

The second likely explanation of the results from Study 2a is the cross-cultural differences between the USA and China (Minkov & Kaasa, 2022), as presented also in the differences in music perception in Study 2c. These differences may arise from varying approaches to individualism, power distance, uncertainty avoidance, long-term orientation, and indulgence. In collectivist cultures like China, values such as social harmony, group cohesion, and respect for hierarchy are the keys to maintaining balance. In contrast, individualistic cultures like the USA place less emphasis on hierarchy and collective obligations. Also, individualistic people tend to be less influenced by group pressure (Bond & Smith, 1996). I suspect such differences may explain the observed results in lowering judgments about fairness in Study 2a among Chinese participants, which underlines the need for more cross-cultural research in the future.

### 6.6. Study 2: Limitations and Future Directions

This study has limits. First, I used only one piece of music known better by American participants than Chinese ones. This may have influenced the cross-cultural differences. Future research may use different pieces of music varying in cultural background and emotional message (happy vs. sad, etc.). Second, the participants were only from two countries and also may not fully represent the broader populations of the

USA and China, which is the same limitation as mentioned in section 5.5. regarding Study 1. A more diverse sample would provide a better understanding of how culture may interact with music and morality. Third, the study specifically examined the self-importance of moral identity and moral foundations, which may not capture the full spectrum of moral beliefs. Future research could expand to include other moral dimensions, such as moral disengagement or moral absolutism, to provide a more comprehensive view of how music influences morality. Fourth, I tested only a few covariates, potentially influencing the relationship between music and morality, like musical education. Much more could be done in this area. For instance, does personality, intelligence, or other characteristics impact it? We still need to do more empirical studies in this area. Finally, to measure moral foundations, I used the Moral Foundations Questionnaire, which assesses only five foundations. As discussed in section 1.5, recent studies have shown that there are actually six moral foundations. A new measure, the Moral Foundations Questionnaire-2, has also emerged, which assesses more foundations and provides evidence that it may be better for cross-cultural research. Unfortunately, this measure was not available when designing the study. When using the MFQ, I noticed a decreased rating of the fairness foundation, which in the new version of the measure is split into two separate foundations. A useful direction for future research would be to repeat the procedure from Study 2a but use the MFQ-2 to identify which element of fairness – equality or proportionality – was actually changed.

### 6.7. Study 2: Conclusions

Happy music did not impact how Americans and Chinese participants thought about the relevance of being a good person, which may suggest that moral identity is not easily manipulated. However, happy music made participants see fairness as a less important moral foundation, but only among Chinese participants. American participants

remained unaffected (Study 2a). Changes in mood did not drive this effect (Study 2b) and may be related to two potential explanations: the specificity of our stimuli or the specificity of our sample (Study 2c). Even though I found differences in both aspects, I suspect the effect may be driven mostly by the stimuli itself, which was more familiar to American participants.

# IV. GENERAL DISCUSSION

Music has long been recognized as a powerful force in shaping human emotions, reasoning, and behavior. From the writings of Plato to contemporary moral psychologists, thinkers and scholars have explored its connections to morality. In recent years, research at the intersection of music and morality has gained increasing attention. This dissertation contributes to the growing field by presenting two original experimental studies that examine the effects of music on moral beliefs from different perspectives, showcasing a range of methods, designs, and statistical analyses that can be applied to this topic.

Understanding the relationship between music and morality requires situating this research within the broader field of moral psychology. In the theoretical part of this dissertation, I reviewed various attempts to define morality, concluding that no single universal definition exists. Instead, multiple frameworks provide different perspectives, and I have chosen one based on the moral triad (thinking, feeling, and doing), which serves as the foundation for the structure of this thesis. I then presented philosophical approaches to morality to highlight potential sources that have shaped our thinking about morality over the centuries. In philosophy, there is also, perhaps even more so, a lack of consistency in defining ethics and morality. However, there is no real need to standardize this concept within philosophy itself. The need to do so arises when we want to study a construct systematically, as we do in psychology. Next, I discussed the key variables used in this research – utilitarianism, moral identity, and moral foundations – along with their operationalization, philosophical and theoretical underpinnings, and how external factors can influence these moral constructs. In recent years, research on decision-making in line with the utilitarian framework has undergone significant changes. For a long time, moral decisions were studied solely using the trolley dilemma introduced in 1967. It was not until 50 years later that new approaches, like the OUS and CNI models, emerged.

Although these three approaches are quite different, they often complement each other when looking at moral decisions and discussing utilitarianism. As a result, many studies in recent years have used all three approaches to test moral decisions from a utilitarian perspective to get a bigger picture. The situation with moral identity is somewhat different because, in this case, the variety of approaches (especially the trait-based and socio-cognitive approaches) often contradict each other. The theory's conceptualization in psychology is based mostly on the socio-cognitive approach. In this case, measures are usually chosen interchangeably since both approaches to moral identity discussed in this thesis (i.e., SIMI and MIQ) are similar, focusing on how important having such an identity is for the individual and how others view them. Finally, Moral Foundations Theory, which underpins the study of the basic values guiding people's lives, is also continuously improving, much like the approaches to utilitarianism. The most classic approach is the MFQ, which I used in Study 2. However, the MFQ-2 is currently a much better approach because it is more culturally adaptable, divides fairness foundation into equality and proportionality, and challenges the previous division between binding and individualizing foundations. In my opinion, the best solution for future research would be to combine the MFQ-2, which assesses moral foundations directly, with MFVs, which present real-life scenarios and ask about moral foundations in an indirect way (also, presenting a new perspective by dividing the care foundation into emotional and physical aspects, with separate categories for humans and animals, and by adding the additional foundation of liberty). Such an approach was missing in the empirical part of this dissertation, but it is an interesting direction for future research. For example, it could be used to replicate Study 2 with these tools and test the effect observed in Study 2a in more ways.

In Chapter 2, I presented a growing body of experimental research on music and morality, although it is still quite limited. I adopted a division of morality into three

aspects, as suggested in one of the proposed definitions: thinking, feeling, and doing. The majority of research has been conducted in the first category, as it is the most commonly chosen way to study morality. There have also been many field experiments examining real-life behaviors rather than just self-reported actions. This area shows the most promise for future research, as previous studies have shown that people often act differently in real life than they claim.

Finally, I identified a gap in the existing literature that my experimental research aims to address by analyzing the limitations of previous studies on music and morality (e.g., small sample sizes, unbalanced samples, or issues with data transparency). I also proposed ways to overcome these limitations, presenting the methods used in this thesis. These included a well-planned study design with additional variables, going beyond the WEIRD sample by conducting cross-cultural research, and applying open science practices such as preregistrations, sharing data, or providing statistical codes.

In the empirical part, I presented studies that focused on two key questions: (1) how exposure to a national anthem influences utilitarian moral judgments and (2) how happy music affects moral identity and moral foundations. In Study 1 ($N$ = 528), I examined how listening to a national anthem – music that is often perceived similarly across cultures – affects utilitarian moral decisions. Using a between-subjects design, I compared an experimental group, where participants listened to their national anthem, with a control group, where participants listened to the control ambient music. Participants also reported their basic emotions, pride, national attachment, and music-related aspects. The study was conducted with Chinese and American participants. The results showed that those in the experimental group, regardless of nationality, were significantly less likely to endorse decisions that involved harming one person for the greater good – a choice aligned with philosophical utilitarianism. Sections 5.4.–5.6.

discuss these findings, their possible explanations, study limitations, and directions for future research.

In Study 2 (total $N = 388$), I investigated how exposure to Western-oriented happy music influences the self-importance of moral identity and moral foundations. This study consisted of three sub-studies, with Study 2b and Study 2c further exploring the effects observed in Study 2a.

In Study 2a ($N = 183$), using a mixed design, I measured each participant twice over a 7–10-day interval – once without music and once after listening to a one-minute happy song, and compared two cultural groups (Chinese and Americans) simultaneously. I also asked participants about their positive and negative affect, empathy, and music-related aspects. The results showed that only Chinese participants (but not Americans) rated the moral foundation of fairness lower after listening to happy music. There was no effect on the self-importance of moral identity. These results are discussed in detail in Section 6.2.4.

In Study 2b ($N = 101$), I tested whether a different stimulus would produce the same effect as in Study 2a. Using the same procedure as in Study 2a and within-subject design, I replaced the music with a happy image and conducted the study exclusively on Chinese participants. Despite the image inducing a similar affective response, it did not lead to changes in moral foundations. Detailed results are discussed in Section 6.3.4.

In Study 2c ($N = 104$), I explored differences in how Chinese and American participants perceived the music used in Study 2a. Using a between-subjects design, the results revealed significant differences in cultural perceptions of music, i.e., in associations and impressions connected with the musical piece, and in the music itself, particularly in familiarity, liking, arousal, and valence connected to the music. In section 6.4.3., I discuss these findings, their possible causes, limitations, and implications for

future research. The overall results of Study 2 are synthesized in Sections 6.5.–6.7., where I discuss their implications, study limitations, and broader directions for future research in this field.

In sum, In Study 1, I aimed to use a song that would have a similar meaning to every participant regardless of their nationality – the national anthem. Even though the emotional reaction to it was different between countries in almost all tested emotions (besides the anger), the effect observed was among the whole sample, regardless the nationality. In Study 2, I used a piece of music that was connected with only one culture (Western), and indeed, the effect was observed only among one culture (Eastern). Similarly to Study 1, the emotional reaction to the song was different in the two countries. However, emotional reaction cannot justify the effect, which I showed in Study 2b. In Study 2c, I demonstrated that this effect may be influenced both by cultural factors and the stimulus itself.

These studies contribute to broader discussions on the role of experimental research in moral psychology. While many previous studies have relied on correlational methods, experimental approaches allow for controlled testing of causal relationships. However, the replication crisis in psychology has underscored the need for methodological rigor, transparency, and cross-cultural validation. This dissertation aims to meet the highest standards of contemporary experimental psychology by implementing well-powered experimental designs, preregistering hypotheses and procedures, employing robust statistical analyses using programming languages, publicly sharing data and study materials, and including diverse participant samples.

This thesis expands our understanding of how music – a fundamental part of human life – interacts with moral beliefs. It offers new insights into the psychological mechanisms linking music to moral thinking and highlights the importance of

interdisciplinary approaches that bring together psychology, philosophy, and music. However, with only two studies, this contribution represents just a small step in a broad and complex field. More research is needed using different measures and various types of music.

Additionally, although my thesis contributes to the cross-cultural perspective of experimental research, and moving beyond WEIRD samples is crucial for a fuller understanding of human morality, this research examined only two countries. This is not enough to draw firm conclusions. However, without including a non-WEIRD country, Study 2 would not have shown any effects, suggesting that music's influence on moral foundations may be dependent on culture. This further underscores the need to include a wider range of countries in psychological research to gain a more comprehensive understanding of how culture shapes the relationship between music and moral beliefs.

Thus, in response to the question posed in the title of this dissertation: yes, music can influence moral beliefs. However, its effects depend on contextual factors such as cultural background and the specific aspects of moral beliefs examined. These findings highlight the complexity of the relationship between music and morality, emphasizing the need for further interdisciplinary research to better understand the underlying mechanisms.

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## ABSTRACT

Music is a powerful force that influences human emotions, reasoning, and behavior. While its impact on emotions and social interactions is well-documented, less is known about its role in shaping moral beliefs. This dissertation contributes to this emerging field by examining how different types of music affect moral decision-making, moral identity, and moral foundations. I conducted two experimental studies to explore these effects.

In Study 1 ($N$ = 528), I investigated whether exposure to a national anthem influences utilitarian moral judgments. Using a between-subjects design, participants from China and the USA either listened to their national anthem or to emotionally neutral ambient music. The results showed that those who listened to the anthem were less likely to endorse decisions that involved harming one person for the greater good.

In Study 2 (total $N$ = 388), I examined how happy music influences moral identity and moral foundations. This study included three sub-studies. In Study 2a (N = 183), I used a mixed design, measuring participants' moral identity and moral foundations before and after listening to a one-minute happy song and comparing participants from two cultures. The findings indicated that Chinese participants, but not Americans, judged the moral foundation of fairness lower after listening to happy music. The self-importance of moral identity remained stable. In Study 2b ($N$ = 101), I tested whether a similar effect could be triggered by a different stimulus – a happy image. However, exposure to the image did not produce the same changes in moral foundations despite eliciting the same affect. This suggests a unique effect of music rather than affect alone, which contradicts some previous research. In Study 2c ($N$ = 104), I explored differences in how Chinese and American participants perceived the music used in Study 2a, revealing cross-cultural

differences in impressions and associations with music, as well as differences in stimuli regarding familiarity, arousal, and liking of the piece of music.

These findings contribute to the broader discussion of how experimental research can enhance our understanding of moral psychology. While many studies on morality rely on correlational methods, this dissertation highlights the importance of experimental approaches in establishing causal links. Moreover, given the replication crisis in psychology, this research follows best practices by using well-powered designs, preregistration, open data sharing, and cross-cultural samples.

Overall, this dissertation advances our knowledge of how music influences moral beliefs. It demonstrates that music, as a deeply embedded part of human life, has the potential to shape moral judgments and basic moral values. However, the effects of music on morality depend on cultural and contextual factors, emphasizing the need for interdisciplinary and cross-cultural approaches in future research.

## STRESZCZENIE

Muzyka wywiera potężny wpływ na ludzkie emocje, rozumowanie i zachowanie. Chociaż badacze dobrze udokumentowali jej oddziaływanie na emocje i interakcje społeczne, wciąż brakuje wiedzy na temat jej roli w kształtowaniu przekonań moralnych. W mojej rozprawie doktorskiej rozwijam tę dziedzinę badań, analizując, w jaki sposób różne rodzaje muzyki wpływają na podejmowanie decyzji moralnych, tożsamość moralną oraz fundamenty moralne. W tym celu przeprowadziłam dwa badania eksperymentalne.

W Badaniu 1 ($N$ = 528) sprawdziłam, czy ekspozycja na hymn narodowy kształtuje utylitarne osądy moralne. Zastosowałam międzygrupowy schemat badawczy, w którym uczestnicy z Chin i USA słuchali swojego hymnu narodowego lub kontrolnej muzyki ambientowej. Wyniki pokazały, że osoby, które słuchały hymnu, rzadziej akceptowały decyzje moralne polegające na skrzywdzeniu jednej osoby dla większego dobra.

W Badaniu 2 (łączne $N$ = 388) przeanalizowałam wpływ radosnej muzyki na tożsamość moralną i fundamenty moralne. Badanie składało się z trzech części. W Badaniu 2a ($N$ = 183) zastosowałam schemat mieszany, mierząc tożsamość moralną i fundamenty moralne uczestników przed i po wysłuchaniu jednominutowego radosnego utworu oraz porównując wyniki międzykulturowo. Wyniki wykazały, że uczestnicy z Chin, ale nie z USA, ocenili fundament sprawiedliwości niżej po ekspozycji na radosną muzykę. Samoocena tożsamości moralnej nie uległa zmianie. W Badaniu 2b ($N$ = 101) sprawdziłam, czy podobny efekt może wywołać inny bodziec – radosny obraz. Jednak ekspozycja na obraz nie zmieniła ocen fundamentów moralnych, mimo że wywołała identyczny afekt. Ten wynik sugeruje unikalny wpływ muzyki, a nie samego afektu, co stoi w sprzeczności z niektórymi wcześniejszymi badaniami. W Badaniu 2c ($N$ = 104) zbadałam, jak uczestnicy z Chin i USA postrzegali muzykę używaną w Badaniu 2a.

Wyniki wskazują na międzykulturowe różnice w odbiorze i skojarzeniach z muzyką, a także różnice w samym utworze: stopniu jego znajomości, poziomie pobudzenia i ocenie.

Te wyniki przyczyniają się do szerszej dyskusji na temat roli badań eksperymentalnych w rozumieniu psychologii moralności. Większość badań nad moralnością opiera się na metodach korelacyjnych, jednak przeprowadzone eksperymenty podkreślają znaczenie ustalania związków przyczynowych. W kontekście kryzysu replikacyjnego w psychologii stosuję najlepsze praktyki metodologiczne, takie jak wysoka moc statystyczna, prerejestracja, otwarte udostępnianie danych oraz wykorzystanie prób międzykulturowych.

Podsumowując, moja rozprawa poszerza wiedzę na temat wpływu muzyki na przekonania moralne. Ukazuję, że muzyka, jako głęboko zakorzeniony element ludzkiego życia, kształtuje osądy moralne oraz podstawowe wartości moralne. Jednak jej wpływ na moralność zależy od czynników kulturowych i kontekstualnych, co podkreśla potrzebę interdyscyplinarnych oraz międzykulturowych podejść w przyszłych badaniach.

## LIST OF FIGURES

## LIST OF TABLES

# APPENDICES

## Appendix 1. Study 1 Survey

Welcome to our experimental study in which we investigate links between music and moral judgments! In a moment, a series of questions will appear on the screen, to which we ask for honest answers. Neither of them is correct nor wrong because people are different from each other. First, you will listen to a song. We understand that different kinds of music can evoke different emotions. Remember, if you feel uncomfortable, you can stop at any moment without any consequences. After the song, we will ask you to fill in the questionnaires (moral dilemmas). At the end, we will ask you to fill in your demographics. We will ask, e.g., about the degree of your education or political orientation. The study does not have a political background; we are interested only in links between music and morality. Your participation is voluntary, and you will be paid after the survey is completed. The study will last for about 20 minutes. Remember that you are anonymous for the researcher's entire duration of the study, and the obtained results will only be used for statistical analysis. If you have any questions, please contact us at katarzyna.pypno@us.edu.pl. Good luck!

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Theofilos Gkinkopoulos, Jagiellonian University, Poland

Tuomas Eerola, Durham University, UK

**INFORMED CONSENT**

Do you give informed consent to participate in the study? YES/ NO

**TEST AUDIO**

For this study, you must have headphones on. Put them on now and test the sound.

<test_audio>

Is everything all right?

**LISTENING TO MUSIC**

Now you will listen to music. It will last about 2'30"; please listen to the whole piece, focus on it, and do not do anything else during this time. Just relax. After listening to music, you will be asked to answer several questions.

What numbers are spoken by the lector during the music?

- What emotions listed below did you feel during listening to the song? Rate it on a scale from 0 = not at all to 6 = very much. Anger/ happiness/ sadness/ disgust/ surprise/ fear/ pride
- How familiar were you with the song? From 0 = not at all to 6 = very much

**CNI MODEL**

On the following pages you will see a series of scenarios that people may come across in life. Please read them carefully. Even though some scenarios may seem similar, each scenario is different in important ways. After each scenario, you will be asked to make a judgment about whether you find the described action appropriate (acceptable) or inappropriate (unacceptable). Please note that some scenarios refer to things that may seem unpleasant to think about. This is because we are interested in people's thoughts about difficult, real-life issues.

1. You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if

your government does not pay a ransom of one million dollars. The group will use the ransom money to buy weapons for their guerilla war, which will cause the deaths of many people. Congress has approved payment of the ransom, but you have the power to veto the payment. In this case, would you veto the ransom payment? YES/ NO

2. You are a doctor in an area that suffers from an outbreak of a highly contagious disease. Preliminary tests have shown the success of a new vaccine that is not approved by the health department of your country, because of its severe side-effects. The side-effects of the vaccine will likely cause the death of dozens of people who are not infected, but the vaccine will save hundreds of lives by preventing spread of the virus. One of your colleagues plans to use the vaccine, but you could stop him by reporting his plans to the health department. In this case, would you report your colleague to the health department? YES/ NO
3. You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and deadly to seniors and children. The student suffers from a chronic immune deficiency that will make her die from the virus if she is not returned to her home country for special treatment. However, taking her out of quarantine involves a considerable risk that the virus will spread. In this case, would you take the student out of quarantine to return her to her home country for treatment? YES/ NO
4. You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony, but you know that he will get better again soon. For days, he has been waiting to see improvements. Since he no longer wants to endure his pain, he repeatedly asks

you to end his life. Suddenly, he has a severe heart attack. You could give him a drug to save him from dying. In this case, would you provide your patient with this drug? YES/ NO

5. You are a member of a special police department who is trained to obtain information in particularly difficult cases. You are dealing with a case involving a male adult who is accused of having abducted several children. You don't know where he is hiding the children, and he refuses to tell you where they are. The children will likely die from dehydration if they are not found within the next 24 hours. You have tried every legal interrogation technique, but none of them were successful. To get information on where the children are, your partner starts using illegal techniques that are deemed torture, and you consider stopping him by reporting him to your supervisor. In this case, would you stop your partner from using illegal interrogation techniques? YES/ NO
6. You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. The patients all need organ transplants or they will die. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. One of your co-workers plans to terminate his life support and take his organs for the five accident victims, so that their lives will be saved. You could stop your co-worker by informing the director of the hospital. In this case, would you stop your co-worker from terminating the patient's life support to take his organs? YES/ NO

**ATTENTION CHECK**

- You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if

your government does not pay a ransom of one million dollars. Please mark if you read the commands and choose "yes" to this question. This way we will know you read the stories carefully and respond according to your beliefs. Thank you! In this case, would you veto the decision to pay the ransom? YES/ NO

- You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. The patients all need organ transplants or they will die. Please mark if you read the commands and choose “no” to this question. This way we will know you read the stories carefully and respond according to your beliefs. Thank you! In this case, would you stop your partner from using illegal interrogation techniques? YES/ NO

**CONTINUATION OF THE CNI MODEL**

7. You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy weapons for their guerilla war, which will cause the deaths of many people. As the president, you have the power to approve payment of the ransom. In this case, would you approve the ransom payment? YES/ NO
8. You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. The patients all need organ transplants or they will die. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. You could terminate his life support and take his organs for the five accident victims, so that their lives will be saved. In this case, would you terminate the patient’s life support to take his organs? YES/ NO

9. You are a doctor in an area that suffers from an outbreak of a highly contagious disease. Preliminary tests have shown the success of a new vaccine that is not approved by the health department of your country, because of its severe side-effects. The side-effects of the vaccine will likely cause the death of dozens of people who are not infected, but the vaccine will save about the same number of lives by preventing spread of the virus. In this case, would you use the vaccine? YES/ NO
10. You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and can cause severe stomach cramps. The only medication that can effectively stop the virus from spreading has severe side-effects. Although the virus will not kill her, the student suffers from a chronic immune deficiency that will make her die from these side-effects. In this case, would you give the student the medication? YES/ NO
11. You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony and you know that his condition will never improve. For days, he has been waiting for his death. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. You could give him a drug causing his death, which will release him from his pain. In this case, would you provide your patient with this drug? YES/ NO
12. You are a member of a special police department who is trained to obtain information in particularly difficult cases. You are dealing with a case involving a male adult who is accused of having stolen several paintings. You don't know where he is hiding the paintings, and he refuses to tell you where they are. The

paintings will likely be shipped to a different country if they are not found within the next 24 hours. You have tried every legal interrogation technique, but none of them were successful. To get information on where the paintings are, your partner starts using illegal techniques that are deemed torture, and you consider stopping him by reporting him to your supervisor. In this case, would you stop your partner from using illegal interrogation techniques? YES/ NO

**LISTENING TO MUSIC**

To remind you of a song, please listen to it again, it will last about 1 minute.

What numbers are spoken by the lector during the music?

**CONTINUATION OF THE CNI MODEL**

13. You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. These patients all need organ transplants or they will have serious health problems for the rest of their lives. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. One of your co-workers plans to terminate his life support and take his organs for the five accident victims, so that they won't suffer from health problems. You could stop your co-worker by informing the director of the hospital. In this case, would you stop your co-worker from terminating the patient's life support to take his organs? YES/ NO
14. You are a doctor in an area that suffers from an outbreak of a highly contagious disease. Preliminary tests have shown the success of a new vaccine that is not approved by the health department of your country, because of its severe side-effects. The side-effects of the vaccine will likely cause the death of dozens of

people who are not infected, but the vaccine will save about the same number of lives by preventing spread of the virus. One of your colleagues plans to use the vaccine, but you could stop him by reporting his plans to the health department. In this case, would you report your colleague to the health department? YES/ NO

15. You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use the ransom money to buy food for their families, who live in an area that has been plagued by several draughts. As the president, you have the power to approve payment of the ransom. In this case, would you approve the ransom payment? YES/ NO
16. You are a member of a special police department who is trained to obtain information in particularly difficult cases. You are dealing with a case involving a male adult who is accused of having stolen several paintings. You don't know where he is hiding the paintings, and he refuses to tell you where they are. The paintings will likely be shipped to a different country if they are not found within the next 24 hours. You have tried every legal interrogation technique, but none of them were successful. To get information on where the paintings are, you consider the use of illegal techniques that are deemed torture. In this case, would you use illegal interrogation techniques? YES/ NO
17. You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and deadly to seniors and children. The only medication that can effectively stop the virus from spreading has severe side-effects. Although the virus will not kill her, the student suffers from a chronic immune deficiency that

will make her die from these side-effects. In this case, would you give the student the medication? YES/ NO

18. You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony, but you know that he will get better again soon. For days, he has been waiting to see improvements. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. You could give him a drug causing his death, which will release him from his pain. In this case, would you provide your patient with this drug? YES/ NO
19. You are a surgeon in a small hospital. One day, your hospital receives five badly hurt patients from a car accident. These patients all need organ transplants or they will have serious health problems for the rest of their lives. You have no spare organs, but there is a patient who has been in a coma for several weeks and it seems unlikely that he will wake up again. You could terminate his life support and take his organs for the five accident victims, so that they won't suffer from health problems. In this case, would you terminate the patient's life support to take his organs? YES/ NO
20. You are a doctor in an area that suffers from an outbreak of a highly contagious disease. Preliminary tests have shown the success of a new vaccine that is not approved by the health department of your country, because of its severe side-effects. The side-effects of the vaccine will likely cause the death of dozens of people who are not infected, but the vaccine will save hundreds of lives by preventing spread of the virus. In this case, would you use the vaccine? YES/ NO
21. You are a member of a special police department who is trained to obtain information in particularly difficult cases. You are dealing with a case involving

a male adult who is accused of having abducted several children. You don't know where he is hiding the children, and he refuses to tell you where they are. The children will likely die from dehydration if they are not found within the next 24 hours. You have tried every legal interrogation technique, but none of them were successful. To get information on where the children are, you consider the use of illegal techniques that are deemed torture. In this case, would you use illegal interrogation techniques? YES/ NO

22. You are a doctor and are treating a seriously ill, suffering patient. Even the strongest drugs do not relieve him from his pain anymore. He feels terrible agony and you know that his condition will never improve. For days, he has been waiting for his death. Since he no longer wants to endure his pain, he repeatedly asks you to end his life. Suddenly, he has a severe heart attack. You could give him a drug to save him from dying. In this case, would you provide your patient with this drug? YES/ NO
23. You are the director of a hospital in a developing country. A foreign student who is volunteering in the country got infected with a rare virus. The virus is highly contagious and can cause severe stomach cramps. The student suffers from a chronic immune deficiency that will make her die from the virus if she is not returned to her home country for special treatment. However, taking her out of quarantine involves a considerable risk that the virus will spread. In this case, would you take the student out of quarantine to return her to her home country for treatment? YES/ NO
24. You are the president of your country. A guerilla group operating in a conflict zone has abducted a journalist from your country and threatens to behead him if your government does not pay a ransom of one million dollars. The group will use

the ransom money to buy food for their families, who live in an area that has been plagued by several draughts. Congress has approved payment of the ransom, but you have the power to veto the payment. In this case, would you veto the ransom payment? YES/ NO

**LISTENING TO MUSIC**

To remind you of a song, please listen to it again, it will last about 1 minute.

What numbers are spoken by the lector during the music?

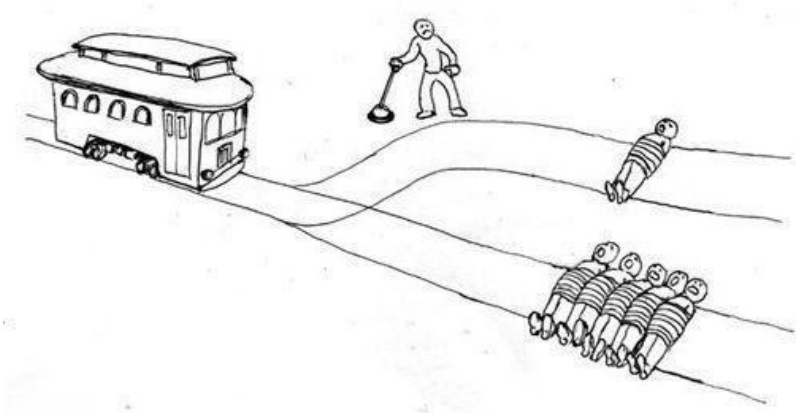
**OXFORD UTILITARIANISM SCALE**

On a scale of 1 = I strongly disagree to 7 = I strongly agree, how much do you agree with the following statements?

- If the only way to save another person's life during an emergency is to sacrifice one's own leg, then one is morally required to make this sacrifice.
- From a moral point of view, we should feel obliged to give one of our kidneys to a person with kidney failure since we don't need two kidneys to survive, but really only one to be healthy.
- From a moral perspective, people should care about the well-being of all human beings on the planet equally; they should not favor the well-being of people who are especially close to them either physically or emotionally.
- It is just as wrong to fail to help someone as it is to actively harm them yourself.
- It is morally wrong to keep money that one doesn't really need if one can donate it to causes that provide effective help to those who will benefit a great deal.
- It is morally right to harm an innocent person if harming them is a necessary means to helping several other innocent people.

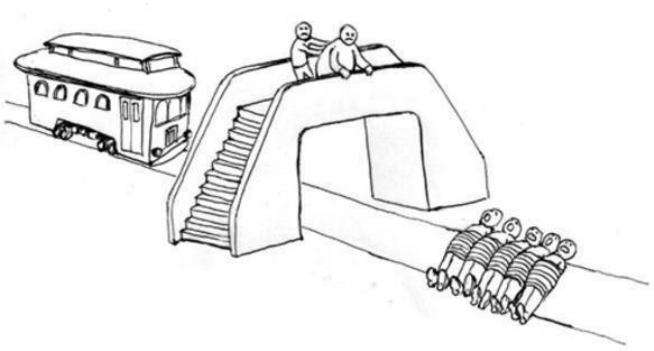
- If the only way to ensure the overall well-being and happiness of the people is through the use of political oppression for a short, limited period, then political oppression should be used.
- It is permissible to torture an innocent person if this would be necessary to provide information to prevent a bomb going off that would kill hundreds of people.
- Sometimes it is morally necessary for innocent people to die as collateral damage—if more people are saved overall.

**TROLLEY DILEMMA**



There is a runaway trolley barreling down the railway tracks. Ahead, on the tracks, there are five people tied up and unable to move. The trolley is headed straight for them. You are standing some distance off in the train yard, next to a lever. If you pull this lever, the trolley will switch to a different set of tracks. However, you notice that there is one person on the sidetrack. What would you do? (scale from 1 = I definitely do nothing to 7 = I definitely pull the level).

**FOOTBRIDGE DILEMMA**



As before, a trolley is hurtling down a track towards five people. You are on a bridge under which it will pass, and you can stop it by putting something very heavy in front of it. As it happens, there is a very fat man next to you – your only way to stop the trolley is to push him over the bridge and onto the track, killing him to save five. What do you do? (scale from 1 = I definitely do nothing to 7 = I definitely push the man onto the track).

**ATTENTION CHECK**

Help us get rid of bots: Please write the number 213 into the comment box.

**COLLECTIVE NARCISSISM**

For each of the following statements, please select the answer that best describes whether you agree or disagree on a scale from 0 = strongly disagree to 10 = strongly agree

- Americans/Chinese deserves special treatment.
- Not many people seem to fully understand the importance of Americans/Chinese.
- I will never be satisfied until Americans/Chinese get the recognition it deserves.

**NATIONAL IDENTITY**

For each of the following statements, please select the answer that best describes whether you agree or disagree on a scale from 0 = strongly disagree to 10 = strongly agree

- I identify as American/Chinese.
- Being an American/Chinese is an important reflection of who I am.

**DEMOGRAPHICS**

- What is your gender? Male/Female/Different
- What is your age?
- How would you describe your current occupational status (you can choose more than one)? Full-time job/ part-time job/ unemployed or looking for a job/ student/ retired/ other
- To what extent are you a religious person? From 0 (*not at all*) to 7 (*very religious*)
- Please tell us what your religion (alphabetical order) is: Buddhism/ Catholicism/ Hinduism/ Islam/ Judaism/ Orthodoxy/ Protestantism/ Other/ I don't practice at all

**MUSIC-RELATED QUESTIONS**

- Which title best describes you? Non-musician/ music-loving non-musician/ amateur musician/ amateur involved in music seriously / semi-professional musician/ professional musician
- Which group of music genres best describes your music taste? From 0 (*Not at all*) to 6 (*Very much*). Smooth (e.g., soul, soft rock)/ unpretentious (e.g., country, folk)/ sophisticated (e.g., classical, opera, jazz)/ intense and loud (e.g., punk, heavy metal)/ rhythmic (e.g., hip-hop, rap, funk)
- I listen attentively to music for _____ per day.
    a. up to 15 minutes (1)

b. up to 30 minutes (2)

c. up to 1 hour (3)

d. up to 2 hours (4)

e. up to 3 hours (5)

f. more than 3 hours (6)

Thank you for participating in our study! The aim of this study was to investigate links between listening to the national anthem and utilitarian moral judgments. If you weren't listening to the national anthem, it meant that you were randomly assigned to the control condition. In case of any questions, please contact us: katarzyna.pypno@us.edu.pl

Katarzyna Pypno, University of Silesia in Katowice, Poland

Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland

Theofilos Gkinkopoulos, Jagiellonian University, Poland

Tuomas Eerola, Durham University, UK

## Appendix 2. Study 2a Survey

We invite you to participate in a study on the relationship between music and morality. To take part in the experiment, you must be at least 18 years old, and you will receive monetary compensation for your participation. The study consists of two parts. Both will take approximately 10 minutes, but they must be completed at least one week apart. Please provide honest answers, as there are no right or wrong responses. The collected data will be used exclusively for statistical purposes, and your participation will remain completely anonymous. During the second part of the study (at least one week later), you will listen to songs, so headphones are required. The music may evoke certain emotions; if you feel uncomfortable, you may stop the study at any time. If you have any questions or concerns, please contact katarzyna.pypno@us.edu.pl.

Katarzyna Pypno, University of Silesia in Katowice, Poland

Chao Xue, Shanghai Normal University, China

Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland

Tuomas Eerola, Durham University, UK

**INFORMED CONSENT**

Do you give informed consent to participate in the study? YES/ NO

**DEMOGRAPHICS**

- What is your gender? Male/Female/Different
- What is your age?

- How would you describe your current occupational status (you can choose more than one)? Full-time job/ part-time job/ unemployed or looking for a job/ student/ retired/ other
- To what extent are you a religious person? From 0 (*not at all*) to 7 (*very religious*)
- Please tell us what your religion (alphabetical order) is: Buddhism/ Catholicism/ Hinduism/ Islam/ Judaism/ Orthodoxy/ Protestantism/ Other/ I don't practice at all

**MUSIC-RELATED QUESTIONS**

- Which title best describes you? Non-musician/ music-loving non-musician/ amateur musician/ amateur involved in music seriously / semi-professional musician/ professional musician
- Which group of music genres best describes your music taste? From 0 (*Not at all*) to 6 (*Very much*). Smooth (e.g., soul, soft rock)/ unpretentious (e.g., country, folk)/ sophisticated (e.g., classical, opera, jazz)/ intense and loud (e.g., punk, heavy metal)/ rhythmic (e.g., hip-hop, rap, funk)
- I listen attentively to music for _____ per day.
    a. up to 15 minutes (1)
    b. up to 30 minutes (2)
    c. up to 1 hour (3)
    d. up to 2 hours (4)
    e. up to 3 hours (5)
    f. more than 3 hours (6)

**PERTH EMPATHY SCALE**

This questionnaire asks about how easily you recognize and experience the emotions of others. Please score the following statements using the scale: 1 = Almost never, 2 = Sometimes, 3 = About half the time, 4 = Most of the time, 5 = Almost always

- Just by seeing or hearing someone, I know if they are feeling sad.
- When I see or hear someone who is sad, it makes me feel sad too.
- Just by seeing or hearing someone, I know if they are feeling happy.
- When I see or hear someone who is happy, it makes me feel happy too.
- Just by seeing or hearing someone, I know if they are feeling angry.
- When I see or hear someone who is angry, it makes me feel angry too.
- Just by seeing or hearing someone, I know if they are feeling amused.
- When I see or hear someone who is amused, it makes me feel amused too.
- Just by seeing or hearing someone, I know if they are feeling scared.
- When I see or hear someone who is scared, it makes me feel scared too.
- Just by seeing or hearing someone, I know if they are feeling calm.
- When I see or hear someone who is calm, it makes me feel calm too.
- Just by seeing or hearing someone, I know if they are feeling disgusted.
- When I see or hear someone who is disgusted, it makes me feel disgusted too.
- Just by seeing or hearing someone, I know if they are feeling enthusiastic.
- When I see or hear someone who is enthusiastic, it makes me feel enthusiastic too.
- Just by seeing or hearing someone, I know if they are feeling embarrassed.
- When I see or hear someone who is embarrassed, it makes me feel embarrassed too.
- Just by seeing or hearing someone, I know if they are feeling proud.
- When I see or hear someone who is proud, it makes me feel proud too.

**SELF-IMPORTANCE OF MORAL IDENTITY**

Listed below are some characteristics that may describe a person:

**Caring, compassionate, fair, friendly, generous, helpful, hardworking, honest and kind.**

The person with these characteristics could be you or it could be someone else. For a moment, visualize in your mind the kind of person who has these characteristics. Imagine how that person would think, feel, and act. When you have a clear image of what this person would be like, answer the following questions according to the scale:

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

- It would make me feel good to be a person who has these characteristics.
- Being someone who has these characteristics is an important part of who I am.
- I would be ashamed to be a person who has these characteristics. (R)
- Having these characteristics is not really important to me. (R)
- I strongly desire to have these characteristics.
- I often wear clothes that identify me as having these characteristics.
- The types of things I do in my spare time (e.g., hobbies) clearly identify me as having these characteristics.
- The kinds of books and magazines that I read identify me as having these characteristics.
- The fact that I have these characteristics is communicated to others by my membership in certain organizations.
- I am actively involved in activities that communicate to others that I have these characteristics.

**MORAL FOUNDATIONS QUESTIONNAIRE**

**Part I: Moral Relevance**

Answer the following questions according to the scale:

1 = not at all relevant, 2 = not very relevant, 3 = slightly relevant, 4 = somewhat relevant,

5 = very relevant, 6 = extremely relevant

- Whether or not someone suffered emotionally
- Whether or not someone cared for someone weak or vulnerable
- Whether or not someone was cruel
- Whether or not some people were treated differently from others
- Whether or not someone acted unfairly
- Whether or not someone was denied his or her rights
- Whether or not someone's action showed love for his or her country
- Whether or not someone did something to betray his or her group
- Whether or not someone showed a lack of loyalty
- Whether or not someone showed a lack of respect for authority
- Whether or not someone conformed to the traditions of society
- Whether or not an action caused chaos or disorder
- Whether or not someone violated standards of purity and decency
- Whether or not someone did something disgusting
- Whether or not someone acted in a way that God would approve of

**Part II: Moral Judgments**

Answer the following questions according to the scale:

1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree,

5 = moderately agree, 6 = strongly agree)

- Compassion for those who are suffering is the most crucial virtue.

- One of the worst things a person could do is hurt a defenseless animal.
- It can never be right to kill a human being.
- When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
- Justice is the most important requirement for a society.
- I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
- I am proud of my country's history.
- People should be loyal to their family members, even when they have done something wrong.
- It is more important to be a team player than to express oneself.
- Respect for authority is something all children need to learn.
- Men and women each have different roles to play in society.
- If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
- People should not do things that are disgusting, even if no one is harmed.
- I would call some acts wrong on the grounds that they are unnatural.
- Chastity is an important and valuable virtue.

**CONTROL QUESTION**

Do you think your answers here are honest, and should we include them in our final analysis? YES/ NO

**INDIVIDUAL CODE**

Please, create your unique code. The code will enable us to combine your answers from first and the second stage of the study.

Please, do it according to the formula: last two numbers of your mobile phone, the day of your birth (if it is 5th May, please write 05, if it is 31st of June, please write 31 etc.), and the last letter of your surname. E.g., 2309K

**THE 7-10 DAYS BREAK**

We invite you to participate in the second part of the study on the relationship between music and morality. In this part, you will be asked to assess your current mood, listen to a song, and then answer questions in questionnaires. Please provide honest answers, as there are no right or wrong responses. The collected data will be used exclusively for statistical purposes, and your participation will remain completely anonymous. The entire process will take approximately 10 minutes, and you will receive monetary compensation for your participation. Since you will be listening to music during the experiment, you must have working headphones. The music may evoke certain emotions; if you feel uncomfortable, you may stop the study at any time. If you have any questions or concerns, please contact katarzyna.pypno@us.edu.pl

Note: if you haven't done the first part of the study yet, please do it first, and come back here after at least a week. Here is the first part of the study: LINK

Katarzyna Pypno, University of Silesia in Katowice, Poland

Chao Xue, Shanghai Normal University, China

Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland

Tuomas Eerola, Durham University, UK

**INDIVIDUAL CODE**

First, please write your code, the same as you provided a week ago.

Do it with a pattern: the second letter of your city, the third letter of your name, the two last numbers of your phone number, and the first letter of your street. For example, if you live in New York, your name is Steve, your phone number is 123456789, and you live on First Street, your code will be: EE89F.

**PANAS SCALE**

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale: 1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = extremely

Interested; Distressed; Excited; Upset; Strong; Guilty; Scared; Hostile; Enthusiastic; Proud; Irritable; Alert; Ashamed; Inspired; Nervous; Determined; Attentive; Jittery; Active; Afraid.

**LISTENING TO MUSIC**

Now, you will listen to music that lasts about 1 minute. Just relax and do nothing during this time. After it, we will ask you to answer some questions.

What numbers are spoken by the lector during the music?

**PANAS SCALE**

Again, please read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale: 1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = extremely

Interested; Distressed; Excited; Upset; Strong; Guilty; Scared; Hostile; Enthusiastic; Proud; Irritable; Alert; Ashamed; Inspired; Nervous; Determined; Attentive; Jittery; Active; Afraid.

**SELF-IMPORTANCE OF MORAL IDENTITY**

Listed below are some characteristics that may describe a person:

**Caring, compassionate, fair, friendly, generous, helpful, hardworking, honest and kind.**

The person with these characteristics could be you or it could be someone else. For a moment, visualize in your mind the kind of person who has these characteristics. Imagine how that person would think, feel, and act. When you have a clear image of what this person would be like, answer the following questions, according to the scale:

1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

- It would make me feel good to be a person who has these characteristics.
- Being someone who has these characteristics is an important part of who I am.
- I would be ashamed to be a person who has these characteristics. (R)
- Having these characteristics is not really important to me. (R)
- I strongly desire to have these characteristics.

- I often wear clothes that identify me as having these characteristics.
- The types of things I do in my spare time (e.g., hobbies) clearly identify me as having these characteristics.
- The kinds of books and magazines that I read identify me as having these characteristics.
- The fact that I have these characteristics is communicated to others by my membership in certain organizations.
- I am actively involved in activities that communicate to others that I have these characteristics.

**MORAL FOUNDATIONS QUESTIONNAIRE**

**Part I: Moral Relevance**

Answer the following questions according to the scale:

1 = not at all relevant, 2 = not very relevant, 3 = slightly relevant, 4 = somewhat relevant, 5 = very relevant, 6 = extremely relevant

- Whether or not someone suffered emotionally
- Whether or not someone cared for someone weak or vulnerable
- Whether or not someone was cruel
- Whether or not some people were treated differently from others
- Whether or not someone acted unfairly
- Whether or not someone was denied his or her rights
- Whether or not someone's action showed love for his or her country
- Whether or not someone did something to betray his or her group
- Whether or not someone showed a lack of loyalty
- Whether or not someone showed a lack of respect for authority

- Whether or not someone conformed to the traditions of society
- Whether or not an action caused chaos or disorder
- Whether or not someone violated standards of purity and decency
- Whether or not someone did something disgusting
- Whether or not someone acted in a way that God would approve of

**Part II: Moral Judgments**

Answer the following questions according to the scale:

1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree)

- Compassion for those who are suffering is the most crucial virtue.
- One of the worst things a person could do is hurt a defenseless animal.
- It can never be right to kill a human being.
- When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
- Justice is the most important requirement for a society.
- I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
- I am proud of my country's history.
- People should be loyal to their family members, even when they have done something wrong.
- It is more important to be a team player than to express oneself.
- Respect for authority is something all children need to learn.
- Men and women each have different roles to play in society.

- If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
- People should not do things that are disgusting, even if no one is harmed.
- I would call some acts wrong on the grounds that they are unnatural.
- Chastity is an important and valuable virtue.

**CONTROL QUESTION**

Do you think your answers here are honest, and should we include them in our final analysis? YES/ NO

Thank you for participating in our study! The aim of this study was to investigate links between listening to the song and self-importance of moral identity and moral foundations. In case of any questions, please contact us: katarzyna.pypno@us.edu.pl

Katarzyna Pypno, University of Silesia in Katowice, Poland

Chao Xue, Shanghai Normal University, China

Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland

Tuomas Eerola, Durham University, UK

## Appendix 3. Study 2b Survey

We invite you to participate in a study on the relationship between music and morality. To take part in the experiment, you must be at least 18 years old, and there is no monetary compensation for participation. The study consists of two parts. Both will take approximately 5 minutes, but they must be completed at least one week apart. To remember the second part, you may set a reminder on your phone. Please provide honest answers, as there are no right or wrong responses. The questions will address sensitive moral issues, which may carry a potential risk of psychological discomfort. Remember that you can withdraw from the study at any time without any consequences. If you feel unwell, you may contact a psychological support hotline, such as the Beijing Psychological Aid Hotline (北京市心理援助热线): 800-810-1117. The collected data will be used exclusively for statistical purposes, and your participation will remain completely anonymous. During the second part of the study (at least one week later), you will view an image. The image may evoke certain emotions; if you feel uncomfortable, you may stop the study at any time.

Katarzyna Pypno, University of Silesia in Katowice, Poland

Chao Xue, Shanghai Normal University, China

Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland

Tuomas Eerola, Durham University, UK

**INFORMED CONSENT**

Do you give informed consent to participate in the study? YES/ NO

**DEMOGRAPHICS**

- What is your gender? Male/Female/Different
- What is your age?
- How would you describe your current occupational status (you can choose more than one)? Full-time job/ part-time job/ unemployed or looking for a job/ student/ retired/ other
- To what extent are you a religious person? From 0 (*not at all*) to 7 (*very religious*)
- Please tell us what your religion (alphabetical order) is: Buddhism/ Catholicism/ Hinduism/ Islam/ Judaism/ Orthodoxy/ Protestantism/ Other/ I don't practice at all

**MUSIC-RELATED QUESTIONS**

- Which title best describes you? Non-musician/ music-loving non-musician/ amateur musician/ amateur involved in music seriously / semi-professional musician/ professional musician
- Which group of music genres best describes your music taste? From 0 (*Not at all*) to 6 (*Very much*). Smooth (e.g., soul, soft rock)/ unpretentious (e.g., country, folk)/ sophisticated (e.g., classical, opera, jazz)/ intense and loud (e.g., punk, heavy metal)/ rhythmic (e.g., hip-hop, rap, funk)
- I listen attentively to music for _____ per day.
    g. up to 15 minutes (1)
    h. up to 30 minutes (2)
    i. up to 1 hour (3)
    j. up to 2 hours (4)
    k. up to 3 hours (5)
    l. more than 3 hours (6)

**PERTH EMPATHY SCALE**

This questionnaire asks about how easily you recognize and experience the emotions of others. Please score the following statements using the scale: 1 = Almost never, 2 = Sometimes, 3 = About half the time, 4 = Most of the time, 5 = Almost always

- Just by seeing or hearing someone, I know if they are feeling sad.
- When I see or hear someone who is sad, it makes me feel sad too.
- Just by seeing or hearing someone, I know if they are feeling happy.
- When I see or hear someone who is happy, it makes me feel happy too.
- Just by seeing or hearing someone, I know if they are feeling angry.
- When I see or hear someone who is angry, it makes me feel angry too.
- Just by seeing or hearing someone, I know if they are feeling amused.
- When I see or hear someone who is amused, it makes me feel amused too.
- Just by seeing or hearing someone, I know if they are feeling scared.
- When I see or hear someone who is scared, it makes me feel scared too.
- Just by seeing or hearing someone, I know if they are feeling calm.
- When I see or hear someone who is calm, it makes me feel calm too.
- Just by seeing or hearing someone, I know if they are feeling disgusted.
- When I see or hear someone who is disgusted, it makes me feel disgusted too.
- Just by seeing or hearing someone, I know if they are feeling enthusiastic.
- When I see or hear someone who is enthusiastic, it makes me feel enthusiastic too.
- Just by seeing or hearing someone, I know if they are feeling embarrassed.
- When I see or hear someone who is embarrassed, it makes me feel embarrassed too.
- Just by seeing or hearing someone, I know if they are feeling proud.
- When I see or hear someone who is proud, it makes me feel proud too.

**MORAL FOUNDATIONS QUESTIONNAIRE**

**Part II: Moral Judgments**

Answer the following questions according to the scale:

1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree)

- Compassion for those who are suffering is the most crucial virtue.
- One of the worst things a person could do is hurt a defenseless animal.
- It can never be right to kill a human being.
- When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
- Justice is the most important requirement for a society.
- I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
- I am proud of my country's history.
- People should be loyal to their family members, even when they have done something wrong.
- It is more important to be a team player than to express oneself.
- Respect for authority is something all children need to learn.
- Men and women each have different roles to play in society.
- If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
- People should not do things that are disgusting, even if no one is harmed.
- I would call some acts wrong on the grounds that they are unnatural.
- Chastity is an important and valuable virtue.

**CONTROL QUESTION**

Do you think your answers here are honest, and should we include them in our final analysis? YES/ NO

**INDIVIDUAL CODE**

Please, create your unique code. The code will enable us to combine your answers from first and the second stage of the study.

Please, do it according to the formula: last two numbers of your mobile phone, the day of your birth (if it is 5th May, please write 05, if it is 31st of June, please write 31 etc.), and the last letter of your surname. E.g., 2309K

**THE 7-10 DAYS BREAK**

We invite you to participate in the second part of the study on the relationship between music and morality. In this part, you will be asked to assess your current mood, view an image, and then answer questions in a questionnaire. Please provide honest answers, as there are no right or wrong responses. Once again, the questions will address sensitive moral issues, which may carry a potential risk of psychological discomfort. Remember that you can withdraw from the study at any time without any consequences. If you feel unwell, you may contact a psychological support hotline, such as the Beijing Psychological Aid Hotline (北京市心理援助热线): 800-810-1117. The collected data will be used exclusively for statistical purposes, and your participation will remain

completely anonymous. The entire process will take approximately 5 minutes, and there is no monetary compensation for participation. Note: if you haven't done the first part of the study yet, please do it first, and come back here after at least a week. Here is the first part of the study: LINK

Katarzyna Pypno, University of Silesia in Katowice, Poland
Chao Xue, Shanghai Normal University, China
Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland
Tuomas Eerola, Durham University, UK

**INDIVIDUAL CODE**

First, please write your code, the same as you provided a week ago.

Do it with a pattern: the second letter of your city, the third letter of your name, the two last numbers of your phone number, and the first letter of your street. For example, if you live in New York, your name is Steve, your phone number is 123456789, and you live on First Street, your code will be: EE89F.

**PANAS SCALE**

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale: 1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = extremely

Interested; Distressed; Excited; Upset; Strong; Guilty; Scared; Hostile; Enthusiastic; Proud; Irritable; Alert; Ashamed; Inspired; Nervous; Determined; Attentive; Jittery; Active; Afraid.

**LOOKING AT THE PICTURE**

Look carefully at this picture for several seconds. Just relax and do nothing during this time. When you are ready, click “NEXT”, and we will ask you a few questions.

But first, write in the box what animal is presented in the picture.

**PANAS SCALE**

Again, please read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way right now, that is, at the present moment. Use the following scale: 1 = very slightly or not at all, 2 = a little, 3 = moderately, 4 = quite a bit, 5 = extremely

Interested; Distressed; Excited; Upset; Strong; Guilty; Scared; Hostile; Enthusiastic; Proud; Irritable; Alert; Ashamed; Inspired; Nervous; Determined; Attentive; Jittery; Active; Afraid.

**MORAL FOUNDATIONS QUESTIONNAIRE**

**Part II: Moral Judgments**

Answer the following questions according to the scale:

1 = strongly disagree, 2 = moderately disagree, 3 = slightly disagree, 4 = slightly agree, 5 = moderately agree, 6 = strongly agree)

- Compassion for those who are suffering is the most crucial virtue.
- One of the worst things a person could do is hurt a defenseless animal.

- It can never be right to kill a human being.
- When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.
- Justice is the most important requirement for a society.
- I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.
- I am proud of my country's history.
- People should be loyal to their family members, even when they have done something wrong.
- It is more important to be a team player than to express oneself.
- Respect for authority is something all children need to learn.
- Men and women each have different roles to play in society.
- If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.
- People should not do things that are disgusting, even if no one is harmed.
- I would call some acts wrong on the grounds that they are unnatural.
- Chastity is an important and valuable virtue.

**CONTROL QUESTION**

Do you think your answers here are honest, and should we include them in our final analysis? YES/ NO

Thank you for participating in our study! This study aimed to investigate links between positive mood and the judgments about moral foundations.

Katarzyna Pypno, University of Silesia in Katowice, Poland

Chao Xue, Shanghai Normal University, China

Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland

Tuomas Eerola, Durham University, UK

## Appendix 4. Study 2c Survey

Welcome to the study, where we aim to learn what people think about a specific piece of music. You will listen to one track lasting approximately 1 minute, after which we will ask you questions about your associations and impressions. There are no right or wrong answers, as people have different perspectives. The study will take no more than 5 minutes, and you will remain anonymous throughout. To participate, you must be at least 18 years old. You will receive compensation according to the rates of the platform you are using. During the study, you will listen to music that may evoke certain emotions. If at any point you feel uncomfortable, you may stop the study at any time without any consequences.

Katarzyna Pypno, University of Silesia in Katowice, Poland

Chao Xue, Shanghai Normal University, China

Mariola Paruzel-Czachura, University of Silesia in Katowice, Poland

Tuomas Eerola, Durham University, UK

**INFORMED CONSENT**

Do you give informed consent to participate in the study? YES/ NO

**DEMOGRAPHICS**

1. What is your gender?
    - Women
    - Men
    - Other
    - Prefer not to say

2. What is your age? _____
3. What is your cultural background?
    - American
    - Chinese

**LISTENING TO MUSIC**

Now, you will listen to a piece of music that lasts about 1 minute. Just relax and do nothing during this time. After the music, we will ask you to answer some questions.

What numbers are spoken by the lector during the music?

**ASSOCIATIONS AND IMPRESSIONS**

1. What are your associations with this piece of music? (i.e., memories, scenes, moments, people, etc. evoked by the music) _____
2. What are your impressions while listening to this piece of music? (i.e., immediate thoughts and feelings) _____
3. Can you tell if this piece of music was composed rather by an Eastern or Western composer? (note that Eastern refers to Asian countries excluding the Westernized countries in the East): definitely Western composer / probably Wester composer / I can't tell / probably Eastern composer / definitely Eastern composer
4. Did you like this piece of music? 1 = very slightly or not at all / 2 = a little / 3 = moderately / 4 = quite a bit / 5 = extremely
5. Did this piece of music sound familiar to you? 1 = very slightly or not at all / 2 = a little / 3 = moderately / 4 = quite a bit / 5 = extremely
6. Can you rate how calm or arousing the piece was? 1 = very calm / 2 = calm / 3 = neutral / 4 = arousing / 5 = very arousing

7. Can you rate how negative or positive the piece sounded? 1 = very negative / 2 = negative / 3 = neutral / 4 = positive / 5 = very positive