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Prevalence of Emotions, Mechanisms, and Motives in Music Listening: A Comparison of Individualist and Collectivist Cultures

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Several studies have explored emotional reactions to music from a psychological perspective. However, little is still known about whether such responses are invariant across cultures. The aim of the present study was thus to investigate the prevalence of (a) emotional reactions, (b) psychological mechanisms, and (c) motives during music listening in a cross-cultural sample. Six hundred sixty-eight participants from 6 countries completed a web survey featuring 22 items that measured musical emotions in general (semantic estimates), the most recent emotion episode involving music (episodic estimates), and individual trait variables (the Satisfaction with Life Scale, Big Five, Rumination & Reflection). Three of the countries investigated (Australia, Sweden, and U.S.A.) were categorized as Individualist (valuing personal independence and achievement), and the remaining 3 (Brazil, Kenya, and Portugal) were categorized as Collectivist (giving priority to in-group goals above individual needs or desires). Comparisons suggested that the patterns of prevalence were relatively similar for the 2 culture categories. Yet there were some notable differences. Thus, for example, *nostalgia–longing*, *spirituality–transcendence*, and *happiness–elation*, and the mechanism *episodic memory*, were more frequent in Collectivist cultures. In contrast, *sadness–melancholy* and the mechanism *musical expectancy* were more prevalent in Individualist cultures. Trait variables explained little variance in the estimates of prevalence. Implications for future research on music and emotion are discussed.

Keywords: cross-cultural comparison, emotion, mechanism, music, personality

Music is a universal human activity that depends on both biological constraints and cultural influence (Hodges & Sebald, 2011). All music listeners share essentially the same body structures (e.g., the auditory system) and the same "laws" that govern physical environments. Yet, musical styles and practices vary considerably across cultures around the world (Lomax, 1962).

The meaning of the term *culture* is not precise. In the past, it has been defined as the shared way of life of a group of people (Berry, Poortinga, Breugelmans, Chasiotis, & Sam, 2011), or as the set of behaviors, beliefs, social structures, and technologies of a population that are passed down from generation to generation (Thompson & Balkwill, 2010). Culture is both internal and external to the person; it may reflect the environment in which a person is living as well as the person's subjective interpretation of that environment (Geertz, 1983).

The meaning of the term *music* is similarly imprecise: there is no generally accepted definition, as all definitions depend on cultural context. In the Western world, a common dictionary definition states that music is "the art of combining vocal or instrumental sounds (or both) to produce beauty of form, harmony, and expression of emotion" (Allen, 1992), though not all music aims for beauty, harmony, or expression of emotion. Merriam (1964) argued that music involves three aspects: sound, concept, and behavior.

Different definitions of culture and music notwithstanding, it is an important task in music cognition to investigate the extent to which musical behaviors are cross-culturally invariant or not (cf. Balkwill & Thompson, 1999; Clayton, 2016; Patel & Demorest, 2013). Cross-cultural studies are required to evaluate the generalizability of results, and also have important implications for theory development (cf. Juslin & Sloboda, 2010). They may, for example, reveal the extent to which cognitive processes are shaped by learning and culture.

Music and Emotion

One apparently universal feature of music's appeal is its ability to produce emotions in listeners. Thus, Becker (2004) proposed, based on a large body of ethnographic research, that autonomic arousal and felt happiness occur consistently across cultures in reaction to musical events, despite differences in the "habitus of listening." However, what is still largely lacking is psychological

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research on musically aroused emotion adopting a cross-cultural perspective.

Psychologists recognize that all human behavior—both "overt" (observable actions) and "covert" (e.g., thoughts)—is dependent on cultural context. Concerning emotions, it has been observed that there are both universal constituents of emotion and cultural differences in emotional practices (Ekman, 1992; Mesquita, Vissers, & De Leersnyder, 2015).

As regards music, a small number of studies have explored listeners' *perception* (or recognition) of emotions in different cultures (Balkwill & Thompson, 1999; Eggebrecht, 1983; Fritz et al., 2009; Gregory & Varney, 1996; Gundlach, 1932, 1935; Kleinen, 1994; Laukka, Eerola, Thingujam, Yamasaki, & Beller, 2013; for a review, see Thompson & Balkwill, 2010). These have revealed that at least some emotions can be communicated cross-culturally through music.

However, there is still a lack of cross-cultural work on musical *induction* of emotion (felt emotion). Key questions from a psychological perspective include: does music arouse emotions in all cultures? If so, how often? Which emotions does music arouse? How does music arouse the emotions? Which functions does music serve in everyday life? In a 2010 author survey for the "Handbook of Music and Emotion" (Juslin & Sloboda, 2010, p. 941), "cross-cultural comparison" was regarded as one of the key directions for future research.

Moderate Universalism

How, then, may a music psychologist adopt a cross-cultural perspective on music and emotion? Although ethnographic studies in countries such as South Africa (Blacking, 1973), Liberia (Stone, 1982), Brazil (Seeger, 1987), New Guinea (Feld, 1982), Peru (Turino, 1993), and South India (Viswanathan & Cormack, 1998) provide "thick" descriptions of the culture-specific ways in which emotional reactions to music are conceptualized and interpreted, it is also true that emotions depend on "brain circuits" with a long evolutionary history (Striedter, 2005). Hence, it seems plausible that there also exist cross-cultural similarities in emotional functioning at some level.

Juslin (2012) suggested that *moderate universalism* (Berry et al., 2011) may be useful in explaining processes that underlie emotional responses to music. This approach presumes that there are both differences and similarities between cultures, but that manifestations of cultural differences in behavior do not necessarily imply the need for postulating different processes at the cognitive level, in particular when dealing with emotions, which involve "old" parts of the brain partly shared with other species (Panksepp, 1998).

Hence, an account of emotions may be cross-culturally valid at the level of mechanisms, despite cross-cultural diversity in musical surface features (e.g., tempo) and aroused emotions. Thus, for example, although music that arouses nostalgia in listeners in one culture can sound different from music that arouses nostalgia in listeners in a different culture; this does not rule out the possibility that the emotion is aroused for the same reasons in both cases (i.e., that they involve the same psychological mechanism).

If the above view is correct, we would expect to see the same underlying mechanisms at work in different cultures, even if there are differences concerning the *prevalence* (i.e., the relative occurrence) of emotions, mechanisms, and listening motives. In the present study, we explored these three issues together, based on the assumption that they are related: Listening motives help to determine what types of musical event a listener will be exposed to, which in turn affects the "affordances" for particular mechanisms to occur, which in turn tend to arouse some emotions more frequently than others. In the following sections, we briefly review each issue before describing the empirical study.

Prevalence of Emotions

The first issue explored in this study is the prevalence of musical emotions. Although music experience may involve several factors (physical, behavioral, perceptual, cognitive, emotional, existential, and developmental; see Gabrielsson, 2011), we will here focus on the emotional factor—often described as the "driving force" behind engagement with music.

Emotions belong to the general field of *affect* (Oatley, Keltner, & Jenkins, 2006), which covers various phenomena having in common that they involve *valence* (the evaluation of an object, person, or event as being positive or negative) and some degree of *arousal* (autonomic activation). *Emotions* are often conceptualized as consisting of a number of subcomponents: appraisal, subjective feeling, physiological response, expression, and action tendency (Frijda & Scherer, 2009; Juslin & Scherer, 2005). The feeling component is typically considered the most important in studies of music (Zentner, Grandjean, & Scherer, 2008).

Indeed, a primary step in developing a theory of musical emotions is to obtain estimates of prevalence of felt emotions in response to music. The findings obtained thus far in Western cultures suggest that music arouses a wide range of emotions (Gabrielsson, 2001, Table 19.2). These feature both "basic" (e.g., sadness, happiness) and "complex" (e.g., nostalgia) emotions, although positive emotions clearly dominate (Juslin & Laukka, 2004; Juslin, Liljeström, Laukka, Västfjäll, & Lundqvist, 2011; Juslin, Liljeström, Västfjäll, Barradas, & Silva, 2008; Sloboda, 1992; Wells & Hakanen, 1991; Zentner et al., 2008). No investigation, however, has estimated the prevalence of musical emotions across different cultures.

Prevalence of Mechanisms

The second issue explored in this study concerns the prevalence of specific mechanisms. To explain why music tends to arouse certain emotions, rather than others, we need to look at *how* the emotions are aroused. Ideally, we should explain both why musical events will arouse an emotion (elicitation) and why the aroused emotion is of a certain kind (differentiation). The psychological process through which this is achieved is usually referred to as the *mechanism*.

Appraisal theories assume that emotions are caused by multidimensional appraisals of events relative to goals. However, because purely instrumental music seems remote from our ongoing plans or life goals (Ellsworth, 1994), several authors have proposed other potential mechanisms such as "musical expectancy" (Meyer, 1956), "conditioned response" (Dowling & Harwood, 1986), "episodic memory" (Baumgartner, 1992), and "contagion" (Juslin, 2000). For reviews of this early work, see Sloboda and Juslin (2001) and Scherer and Zentner (2001).

A more extensive attempt to model the mechanisms started in the mid-2000s (Juslin, 2005, 2013; Juslin & Västfjäll, 2008) and resulted in the BRECVEMAC framework, which currently includes nine mechanisms—ranging from simple reflexes to quite complex judgments—that developed in an evolutionary progression:

(1) *Brain stem reflex*, a hard-wired response to simple acoustic features such as extreme or increasing loudness or speed (Brandão, Melo, & Cardoso, 1993);

(2) *Rhythmic entrainment*, a gradual adjustment of an internal body rhythm (e.g., heart rate) toward an external rhythm in the music which affects the listener's emotions through proprioceptive feedback (Harrer & Harrer, 1977);

(3) *Evaluative conditioning*, a regular pairing of a piece of music and other positive or negative stimuli leading to a conditioned association (Blair & Shimp, 1992);

(4) *Contagion*, an internal "mimicry" of the perceived voice-like emotional expression of the music (Juslin, 2000);

(5) *Visual imagery*, inner images of an emotional character conjured up by the listener through a metaphorical mapping of the musical structure (Osborne, 1981);

(6) *Episodic memory*, a conscious recollection of a particular event from the listener's past, which is triggered by a musical pattern (Baumgartner, 1992);

(7) *Musical expectancy*, a response to the gradual unfolding of the syntactical structure of the music and its expected or unexpected continuation (Meyer, 1956);

(8) *Aesthetic judgment*, a subjective evaluation of the aesthetic value of the music based on an individual set of weighted criteria (Juslin, 2013); and

(9) *Cognitive appraisal*, a multidimensional assessment of the music's implications for the listener's current goals or plans in life (Scherer, 1999).

Most of these mechanisms have been tested in experimental studies, which manipulated music stimuli to obtain evidence of cause and effect (Janata, 2009; Juslin, Barradas, & Eerola, 2015; Juslin, Harmat, & Eerola, 2014; Juslin, Sakka, Barradas, & Liljeström, 2016; Steinbeis, Koelsch, & Sloboda, 2006). However, though these experiments suggest that the mechanisms work, estimates of their prevalence in everyday life need to involve a wider range of methods.

We have thus obtained estimates of prevalence from questionnaires (Juslin et al., 2011), experience sampling (Juslin et al., 2008), and experiments (Juslin et al., 2016)—though only in a single Western culture. A deeper understanding of the processes that underlie emotional responses to music cannot be achieved unless similarities and differences across cultures are taken into account (Thompson & Balkwill, 2010). Yet, the prevalence of mechanisms across cultures has not been investigated.

Prevalence of Listening Motives

The third issue investigated in this study concerns the prevalence of listening motives—how we respond to music depends partly on *why* we listen to it. A few studies have examined listening motives in Western cultures and some of the motives found were to pass the time, to get into the right mood, to relieve tension, to create an image, to reduce loneliness, to listen to the words, or to evoke memories (Gantz, Gartenberg, Pearson, & Schiller, 1978; Juslin & Laukka, 2004; North, Hargreaves, & O'Neill, 2000; Roe, 1985; Sloboda & O'Neill, 2001). Many of the listening motives imply attempts at emotion regulation, which refers to "how we try to influence which emotions we have, when we have them, and how we experience and express these emotions" (Gross, 2008, p. 479). The occurrence of emotion regulation by means of music suggests that people can use music to enhance subjective well-being and health (MacDonald, Kreutz, & Mitchell, 2012).

Psychological studies of music listening motives across different cultures are still rare. Yet cross-cultural differences in emotional responses to music could occur due to different *functions* of music in different cultures. Saarikallio (2012) reviewed cross-cultural research from several disciplines, including lists of functions of music proposed by various authors. Based on her review, she argued that three psychological aspects occur consistently across studies and theories: (a) an emotional element (e.g., using music to express, experience, or regulate affect), (b) an introspective element (e.g., using music for reflection, mental work, personal growth, and spirituality), and (c) a social element (e.g., using music to strengthen social bonding, belonging, cohesion, and identity). Boer and Fischer (2012) note that most previous studies have tended to underestimate the role of social listening motives, as the listener samples came almost exclusively from individualistic cultures (e.g., the U.S.A.). The prevalence of listening motives across different cultures has still not been properly studied.

Rationale for the Present Study

The purpose of this study was to investigate the prevalence of (a) emotional reactions to music, (b) psychological mechanisms, and (c) listening motives, using a cross-cultural sample of music listeners. Moreover, we wanted to examine how these three variables were related to individual differences in personality traits. Cultural differences must be interpreted in relation to differences between individuals. Indeed, obtained cross-cultural differences may be of little practical significance if their effects are smaller than the individual differences *within* cultural groups (Matsumoto, Grissom, & Dinnel, 2001). Several studies have suggested that individual differences in personality traits may influence emotional responses to music (Gerra et al., 1998; Juslin et al., 2008, 2011; Rawlings & Leow, 2008; McCrae, 2007). Hence, we aimed to explore the amount of variance in prevalence explained by traits, as compared with culture.

Individualism Versus Collectivism

Our cross-cultural comparison focused, in particular, on a dimension commonly adopted in cross-cultural studies (Berry et al., 2011) and considered promising also in a music-emotion context (cf. Boer & Fischer, 2012), namely, that between Individualist and Collectivist cultures (Brewer & Chen, 2007; Hofstede, 2001; Triandis, 1994).

Individualistic cultures are usually characterized as valuing personal autonomy, which means that individuals strive to achieve personal goals and are perceived as independent, self-reliant beings. Collectivistic cultures, in contrast, are usually characterized as valuing social embeddedness, which means that individuals tend to pursue group goals over individual goals and the self is seen as interdependent and inseparable from the collective (e.g., the family).

It has been suggested that differences in the types of emotional experiences reported by people across cultures (Mesquita, Frijda, & Scherer, 1997) could be explained in terms of the values and norms inherent to Individualist and Collectivist societies (Mesquita, 2001; for some empirical evidence, see Kitayama, Mesquita, & Karasawa, 2006; Singelis & Sharkey, 1995). For example, in a culture where good relationships are defined by the autonomy and independence of individuals, we can expect to find that socially disengaging emotions (e.g., pride) are more frequent or intense than in a culture where good relationships are defined in terms of interdependence.

Why, then, should the prevalence of emotions, mechanisms, and listening motives during music listening vary as a function of the Individualism–Collectivism dimension? The values within a culture should strongly influence the motives for engaging in music experiences, the frequency with which people engage in musical activities associated with particular emotion-induction mechanisms, and the specific emotions resulting from those activities. To illustrate, in cultures where, say, dancing is highly valued, the mechanism of rhythmic entrainment may play a prominent role in emotional reactions to music, producing feelings of positive arousal. Similarly, in cultures where traditional songs are commonly played to honor important events in life, the mechanism of episodic memory may play a key role, arousing feelings of nostalgia (Juslin, 2013). As a general principle, within Collectivist contexts, we would expect the kinds of music experience that are vigorously sought out—and the resultant emotional experiences—to be strongly tied to social circumstances (e.g., family, social context). Within Individualist contexts, people may be more likely to seek out experiences that reflect unique compositional accomplishments, and their emotional experiences should be more personal. Preliminary data from qualitative studies suggest that Individualist and Collectivist cultures really *do* use music differently, for example that the latter use music more often for dancing together with friends and family (Boer & Fischer, 2012).

Although this study was primarily exploratory, given a lack of previous cross-cultural studies regarding the present issues, we hypothesized that Collectivist cultures would show a higher prevalence of nostalgia and its associated mechanism, episodic memory, than would Individualist cultures. *Nostalgia* has been defined as "sentimental longing or wistful affection for the past" (Pearsall & Hanks, 1998). It is often viewed as a "bitter–sweet" emotion that arises when reminiscing about fond and personally meaningful memories from one's past. Nostalgia is prevalent across cultures and there is cross-cultural agreement about the meaning of the term (Hepper et al., 2014). Nostalgia may serve psychological functions, such as enhancing social connectedness, self-affirmation, and meaning in life.

Preliminary data from Western cultures indicate that nostalgia is a prevalent response to music (Janata, Tomic, & Rakowski, 2007; Juslin et al., 2008), but it might be argued that this emotion, which commonly involves social memories, should be especially important in Collectivist cultures. Thus, for instance, it has been suggested that Collectivist cultures show a greater resistance to change and modernity than Individualist cultures, and that nostalgia serves the function of preserving social identity by reliving one's past (Shaw & Chase, 1989).

A Web-Survey Approach

To address the above research issues, we conducted a web-survey study (Tourangeau, Conrad, & Couper, 2013) which covered three areas: demographic variables (to describe the samples), emotional reactions to music (the main focus), and individual differences (because cultural differences need to be interpreted in relation to differences between individuals).

With regard to emotional reactions, we used two kinds of emotional self-report based on a distinction in memory research (Robinson & Clore, 2002). Self-reports of emotion episodes that are close in time to the report (e.g., "How did you feel one hour ago?") involve judgments based on *episodic memory*. Episodic knowledge is experiential in nature, and is usually rich in information about the time and place of the recalled episode. One's ability to retrieve episodic information declines over time, but especially emotional events tend to be better remembered than nonemotional events (Reisberg & Heuer, 2004). Self-reports of emotions involving aggregated estimates (e.g., "How often do you feel like this, in general?"), in contrast, involve judgments based on *semantic memory*. Semantic knowledge is abstract and frequency-based, though it is also prone to certain retrospective biases because it may be affected by erroneous beliefs (Robinson & Clore, 2002). In the present survey study, we obtained both semantic and episodic reports by asking both about musical emotions *in general* and about the most *recent* emotion episode (see Method). It was expected that the contextual information featured in the episodic reports would provide clues on how to interpret possible cross-cultural differences in the semantic reports.

The web survey was filled out by a cross-cultural sample of music listeners. The choice of culture-bearing units was based on both theoretical and practical considerations. The focus on the Collectivist–Individualist dimension was achieved by sampling participants from three Collectivist countries (Brazil, Kenya, and Portugal) and three Individualist countries (United States of America, Australia, and Sweden). Each culture category included countries from three continents (five unique continents in total). Campbell (1970) notes that a comparison of only two countries is usually not interpretable, because there are too many factors to which an observed difference can be attributed. Hence, we used three countries to represent each category. The selection of countries within each category was based on practical considerations: The selected countries involve three

languages (English, Portuguese, and Swedish) for which the research team included native speakers. This is to the best of our knowledge the first study to measure the prevalence of specific emotions, mechanisms, and listening motives across cultures. Given the difficulty of obtaining samples that are "matched" with regard to all demographic variables, we adopt a conservative approach, where we focus on the largest and most consistent effects. The results are discussed in terms of their implications for future studies on emotional reactions to music and their underlying mechanisms.

Method

Participants

Six hundred and sixty-eight participants (59% females, 41% males) between the ages of 18 and 93 ($M = 32.80$, $SD = 13.36$) took part in the study. They did not receive any monetary compensation for their anonymous and voluntary participation. However, they were informed that their participation would make an important contribution to the science of music and that they could ask to obtain a summary of the results. The samples were drawn from three mainly Individualist (Australia, Sweden, and the United States of America) and three mainly Collectivist countries (Brazil, Kenya, and Portugal), as reported in previous cross-cultural research (Hofstede, 2001). On the index of Individualism created by Hofstede (1983), the United States receives the highest score (91), followed by Australia (90), Sweden (70), Brazil (38), Portugal (27), and Kenya (25).

Table 1 summarizes the demographic characteristics of the samples in terms age, gender, occupation, education, experience of playing musical instruments, music education, and music preferences. Note that the samples consisted primarily of students and employed persons with higher education. There were slightly higher proportions of students in Australia and Sweden, than in the other countries. There were also some differences with regard to music experience (lower incidence of playing musical instruments in Brazil and Kenya; and higher incidence of music education in Australia and the United States) and music preferences, which should be taken into account.

The participants were recruited via advertisements on the Internet posted at various music forums and general topic forums; Internet bulletin boards (Craigslists); national discussion lists (e.g., kenyanlist.com); organizations (Pamojakenya Association); and Facebook groups—and also through calls for participation by means of posters at universities. An English recruitment text (Australia, Kenya, and the United States) was translated (and back-translated) into Portuguese (Brazil, Portugal) and Swedish (Sweden) for use both online and in posters. Because participation was voluntary and did not involve probability sampling from the whole population in each country, the study relies on a convenience sample (Visser, Krosnick, & Lavrakas, 2000).

Questionnaire

A web questionnaire was designed to measure the prevalence of emotions, mechanisms, and listening motives in terms of both

Table 1
Summary of Background Variables for Participants (N = 668)

Variable	Country											
	Australia		Brazil		Kenya		Portugal		Sweden		USA	
Number of participants	131		102		103		126		103		103	
Age: *M* (*SD*)	28.76 (13.29)		28.73 (9.07)		31.15 (9.32)		34.74 (10.00)		36.52 (19.67)		38.06 (13.35)	
Gender (%)	Ma	Fe	Ma	Fe	Ma	Fe	Ma	Fe	Ma	Fe	Ma	Fe
	35	65	44	56	55	45	39	61	41	59	36	64
Occupation (%)												
Employed	33		50		63		71		33		71	
Unemployed	2		1		4		11		3		4	
Student	63		47		32		17		53		23	
Pensioner	2		2		1		1		11		2	
Education (%)												
No education	0		0		1		2		0		0	
Primary school	0		1		6		2		1		1	
Secondary school	24		13		16		19		31		2	
Higher education	76		86		77		77		68		98	
Instrument (%)												
Yes	54		41		20		54		42		38	
No	22		37		49		25		23		16	
Used to play	34		22		31		21		35		46	
Music education (%)												
Yes	71		43		45		52		49		76	
No	29		57		55		48		51		24	
Music genre preferences												
1	Soft/Relaxing		Brazilian pop		Soul/RnB		Fado		Classical		Rock 'n' roll	
2	Am/Brit pop		Rock		Religious		Classical		Rock		Alternative	
3	Rock		Rock 'n' roll		Soft/Relaxing		Rock		Jazz		Am/Brit pop	

Note. Fe = female; Ma = male; *M* = mean; *SD* = standard deviation; (%) = data in percent.

semantic and episodic reports. The questionnaire items were developed in English, and were then translated to Swedish and Portuguese by two of the authors who are native speakers of these languages. It is paramount in cross-cultural research to establish that there is a reasonable degree of conceptual equivalence (i.e., that the concepts used "make sense" in every country investigated). Emotional reactions to music are universal (Becker, 2004), and are believed to rely on universal psychological processes (e.g., memory). In addition, evidence indicates that most of the semantic structure of emotion words is shared across cultures (Romney, Moore, & Rusch, 1997). It would thus seem quite reasonable to assume that there is conceptual equivalence in the present domain.

The Appendix shows the items which were divided into four separate sections.[1] The first set of items (1–8) focused on a selection of demographic and individual variables, such as age, gender, nationality, occupation, education, experience of playing a musical instrument, music education, and music preferences (Table 1). In measuring music preferences, we made an effort to include locally important genres from each country (e.g., fado in Portugal, zouk in Kenya).

The second set of items in the questionnaire (Appendix; items 9–15) measured different aspects of *semantic knowledge* concerning emotional responses to music, sorted into listening motives, overall prevalence of music listening and emotional reactions, prevalence of specific emotions, and prevalence of mechanisms. (All ratings were made on a scale from 0 to 7.)

The participants were required to rate the relative frequency of occurrence of various motives for listening to music in their own lives (item 9 in Appendix). The list of listening motives was based on both theory and empirical findings involving both Western and non-Western cultures (cf. Boer & Fischer, 2012; Juslin & Laukka, 2004; Merriam, 1964; North, Hargreaves, & Hargreaves, 2004; Roe, 1985; Saarikallio, 2012; Sloboda & O'Neill, 2001).

After asking the participants to estimate the *overall* prevalence of music listening (item 10) and emotions (item 11), we measured the prevalence of particular emotion categories, by means of 15 scales (item 12) which have been used at Uppsala University specifically for the measuring of emotional responses to music. They represent a kind of compromise among the response formats currently used in the music-emotion field (Zentner & Eerola, 2010) because the selected terms include "basic" emotions characteristic of discrete-emotion theories (Izard, 1977), cover all four quadrants of the Circumplex model (Russell, 1980) in terms of *valence* and *arousal*, and also feature highly music-relevant terms such as *nostalgia*, *expectancy*, and *awe* (Juslin & Laukka, 2004).[2]

Possible causes of emotion were measured by means of 10 simple questions (item 14) targeting the eight mechanisms in the BRECVEMA framework (see Juslin, 2013) as well as appraisal and lyrics: (1) Brain stem reflex, (2) Rhythmic entrainment, (3) Episodic memory, (4) Evaluative conditioning, (5) Visual imagery, (6) Contagion, (7) Musical expectancy, (8) Aesthetic judgment, (9) Cognitive appraisal, and (10) Lyrics.[3] The notion behind these items was that, although several of the mechanisms are implicit in nature, they may co-occur with subjective impressions that can be reported by a listener. For example, a listener affected by the Expectancy mechanism might find the music difficult to predict, whereas a listener who becomes affected by the Episodic memory mechanism might report conscious recollections of the previous event. Self-reports about causes cannot be taken as "veridical," but the above items have been predictive of both emotions (Juslin et al., 2014) and mechanism-conditions (Juslin et al., 2015) in previous experimental studies.

Three items at the end of the survey (Appendix, items 19–21) also concerned semantic data. The items asked the participant to rate: (a) the prevalence of nostalgia in life in general, (b) the importance in life of musical nostalgia, and (c) the extent of believing music listening enhances one's subjective well-being. (These items were related to our focus on nostalgia.)

A third set of items (Appendix, item 15) measured *episodic knowledge* about musical emotions. Thus, the participant was asked to recall the most *recent* episode when he or she had experienced an emotion to music. It was explained that the emotion might be positive or negative, strong or weak, but that they should not read any further until they could recall a specific event. The following questions were intended to capture the characteristics of the episode—time elapsed, the emotion felt, the intensity of the felt emotion, physical location, main activity, social context, piece of music, source of music, familiarity, choice, liking, the cause of the emotion (e.g., mechanisms), and listening motive.

The final set of items (items 16–18) focused on a number of trait variables regarded as important in the present context. To measure subjective well-being, we used the Satisfaction With Life Scale (SWLS), developed by Diener, Emmons, Larsen, and Griffin (1985). SWLS measures global life satisfaction in terms of a cognitive-judgmental process, one of the three components of subjective well-being identified by Andrews and Withey (1976; the other two were positive and negative affect). A reliability generalization study by Vassar (2007) which featured 77 reliability coefficients from studies using the SWLS reported a mean Cronbach's alpha of .78. Cronbach's alpha in this study was $\alpha = .86$.

To measure personality, we used the Ten-Item Personality Inventory (TIPI; Gosling, Rentfrow, & Swann, 2003, see Appendix, item 17), a brief version of the Big Five Inventory (Costa & McCrae, 1992), which measures *Extraversion*, *Agreeableness*, *Conscientiousness*, *Emotional Stability* (*Neuroticism*), and *Openness to Experience*. Psychometric tests of TIPI reached adequate levels in terms of convergence with widely used Big Five measures in self, observer and peer reports, test–retest reliability, patterns of predicted external correlates, and convergence between self and observer ratings (Gosling et al., 2003).[4] The dimensions of the Big Five model have also been identified in non-Western societies (Berry et al., 2011), and are assumed to be enduring and "biologically anchored" dispositions (McCrae & Allik, 2002). Some of them have been linked to the prevalence of emotional responses to music (cf. Juslin et al., 2011).

[1] Notably, one of the questions (item 13) is intended for another study, and will be analyzed and reported in a separate article (Barradas, Ovsiannikow, & Juslin, 2016).

[2] The focus on emotion categories rather than dimensions was motivated by the argument that "dimensional approaches . . . are less informative about actual emotion experiences in a culture" (Berry et al., 2011, p. 163).

[3] We originally planned to include two further response alternatives—about the circumstances and personality of the musician—but due to technical problems, these were not properly uploaded onto the web questionnaire.

[4] Cronbach's alpha is not really applicable to this short scale, which aims to measure two highly different facets of each personality factor.

To assess participants' self-attention focus, we used the Rumination & Reflection scale developed by Trapnell and Campbell (1999). The scale features 24 items, divided across two subscales. The *rumination* subscale measures an individual's self-attentiveness on perceived losses, threats, and injustices—including negative thoughts about the past. A high *rumination* score is linked with depression and biased focus on negative stimuli. The *reflection* subscale, in contrast, measures an individual's reflection and curiosity about the self. A high *reflection* score is linked with adaptive and healthy attention. The subscales represent different "coping styles" in which rumination is considered maladaptive and reflection adaptive. They correlate with personality characteristics: *Rumination* is correlated with *Neuroticism*, and *Reflection* is correlated with *Openness to Experience*. The scale as a whole has been found to predictive of music listening behavior in a Western culture (Garrido, 2009). Trapnell and Campbell (1999) reported a high internal reliability for the scale: $\alpha = .91$. Cronbach's alphas in this study were .85 (*Rumination*) and .87 (*Reflection*), respectively.

Procedure

Six surveys (one per country) were administered on the Internet, using the open-source platform *eSurv* (http://esurv.org/). A brief cover letter appeared on the first page, prior to the decision whether to take part in the study. It was explained that data collected would be used only for research purposes and that the participant was free to withdraw from the study at any time. The survey platform was tweaked so that the participant would receive pop-up messages if he or she forgot to respond to a specific item. The responder's IP address was further saved temporarily to control the nationality. We could not prevent people from other countries than those targeted from taking the survey. Hence, a total of 719 individuals completed the survey, of which 51 came from nontarget countries, which had to be excluded from the final sample, to avoid problems in terms of interpretation. (We also excluded another four participants who were too young to participate in the survey.) The IP number could also be used to control that participants did not take the survey more than once. We recorded the date and amount of time the participant took to complete the survey. The average duration needed to fill out the survey was 25 min. When the survey was completed, the participant was redirected to the server homepage. Responses were saved on the *eSurv* server and then downloaded for analysis. Data were collected between July 2014 and February 2015.

Results

Semantic Data

Prevalence of emotions. Estimated mean frequency of music listening in terms of hours per week—including all responses from 0 to 40 hr—was 18.70 ($SD = 10.14$), which amounts to approximately 2.5 hr per day on average. In this range, there was no significant difference between Individualist ($M = 18.52$, $SD = 10.06$) and Collectivist ($M = 18.89$, $SD = 10.24$) cultures, $F(1, 582) = 0.30$, $p = .658$, $\eta^2 = .01$.[5] However, for the separately analyzed "more than 40 hours" category, which constituted 13% of the responses as a whole, there was a higher frequency in Collectivist cultures ($n = 55$, 16%) than in Individualist cultures ($n = 29$, 9%), $\chi^2(1) = 8.68$, $p = .003$, $N = 668$.

The participants were asked to estimate the relative proportion of musical episodes in everyday life that arouse an emotion in them. The mean proportion was 56.75 ($SD = 25.33$), and there was no significant difference between Individualist ($M = 56.17$, $SD = 25.16$) and Collectivist ($M = 57.34$, $SD = 25.51$) cultures in this regard, $F(1, 666) = 0.36$, $p = .551$, $\eta^2 = .01$. When these data were combined with listening frequency data (for frequencies up to 40 hours per week), the results indicated that music arouses an emotion in listeners 10.85 hours per week on average ($SD = 8.26$).

To investigate how the rated prevalence of specific emotions varied as a function of the Individualist–Collectivist dimension, we conducted a one-way multivariate analysis of variance (MANOVA), between subjects, with *culture category* as the independent variable (two levels), and the 15 emotion scales as the dependent variables. The multivariate test revealed a highly significant effect, Wilks's = .79, $F(15, 651) = 11.34$, $p < .001$. The effect size ($\eta^2 = .21$) may be regarded as "small," in terms of Ferguson's (2009) guidelines for interpretation.

The upper section of Table 2 displays contrasts between Individualist and Collectivist cultures for each emotion scale. Post hoc tests (Tukey's honestly significant difference [HSD]) revealed a significant difference for eight of the 15 scales (= 53%). As can be seen, *surprise–astonishment*, *nostalgia–longing*, *anxiety–nervousness*, *love–tenderness*, *spirituality–transcendence*, *happiness–elation*, *interest–expectancy*, and *pride–confidence* were rated as more prevalent in Collectivist cultures than in Individualist cultures. Of these differences, one effect was "moderate"; six were "small"; and one did not quite reach "small" in terms of Cohen's (1988) guidelines for interpretation.[6] Note that the five most prevalent emotions, across culture categories (see the right-most column of Table 2), were *pleasure–enjoyment*, *happiness–elation*, *calm–contentment*, *love–tenderness*, and *nostalgia–longing* (all means >4.70).

Figure 1 presents means and standard errors of the prevalence ratings, as a function of individual countries, for the five emotions that showed: (a) a significant difference between the culture categories, (b) at least a "small" effect size, and (c) an overall prevalence of circa 4.00. The largest and most consistent effects across countries occurred for *nostalgia–longing*, *love–tenderness*, and *spirituality–transcendence*, but Brazil stands out concerning *nostalgia–longing* and Kenya concerning *love–tenderness* and *spirituality–transcendence*.

Prevalence of mechanisms. A MANOVA, between subjects, with *culture category* as the independent variable and the 10 mechanisms as the dependent variables, revealed a highly significant multivariate test, Wilks's = .78, $F(10, 657) = 18.67$, $p < .001$, though the effect was again "small" ($\eta^2 = .22$). Post hoc tests (Tukey's HSD) showed a significant difference for all mechanisms except one (90%), namely, *rhythmic entrainment* (Table 2, middle

[5] The focus here is on comparing the culture categories. Notably, however, post hoc tests revealed that only two contrasts between countries were significant: Kenya showed a higher mean than Portugal and Sweden ($ps < .05$).

[6] Notably, we use Ferguson's (2009) guidelines for interpreting eta-squared (η^2) and Cohen's (1988) guidelines for interpreting the standardized mean difference (*d*).

Table 2
Comparison of Individualist and Collectivist Cultures for Prevalence of Specific Emotions, Mechanisms, and Listening Motives

Variable	Individualist		Collectivist				Overall	
	M	*SD*	*M*	*SD*	p^a	*d*	*M*	*SD*
Emotions								
Happiness	5.58	1.27	5.85	1.29	.007*	−.21	5.71	1.29
Sadness	4.10	1.76	3.98	1.89	.400	.07	4.04	1.83
Surprise	2.43	1.37	2.89	1.60	<.001*	−.31	2.66	1.51
Calm	5.17	1.43	5.37	1.43	.072	−.14	5.27	1.43
Interest	4.07	1.73	4.45	1.77	.005*	−.22	4.25	1.76
Nostalgia	4.40	1.65	5.07	1.71	<.001*	−.40	4.74	1.71
Anxiety	1.85	1.14	2.24	1.47	<.001*	−.30	2.05	1.33
Pride	3.92	1.79	4.23	1.89	.027*	−.17	4.07	1.84
Anger	2.13	1.40	2.10	1.43	.775	.02	2.11	1.41
Love	4.48	1.63	5.10	1.73	<.001*	−.37	4.79	1.71
Disgust	1.76	1.24	1.68	1.17	.378	.07	1.72	1.20
Admiration	3.99	1.81	3.94	2.02	.729	.03	3.97	1.92
Boredom	2.26	1.42	2.07	1.38	.076	.14	2.16	1.40
Pleasure	5.81	1.34	5.63	1.48	.092	.13	5.72	1.41
Spirituality	3.36	1.95	4.60	2.09	<.001*	−.61	3.98	2.11
Mechanisms								
Brain stem reflex	2.54	1.65	3.04	1.84	<.001*	−.29	2.79	1.76
Entrainment	5.52	1.35	5.61	1.33	.350	−.07	5.56	1.34
Episodic memory	4.94	1.62	5.67	1.44	<.001*	−.48	5.30	1.58
Conditioning	4.99	1.53	5.26	1.58	.021*	−.17	5.12	1.56
Visual imagery	4.48	1.84	4.81	1.85	.024*	−.18	4.64	1.85
Contagion	5.06	1.64	5.57	1.43	<.001*	−.33	5.31	1.56
Expectancy	4.18	1.69	3.72	1.81	<.001*	.26	3.95	1.77
Aesthetic judgment	5.24	1.60	5.52	1.46	.021*	−.18	5.38	1.54
Cognitive appraisal	2.84	1.65	4.18	1.94	<.001*	−.74	3.50	1.92
Lyrics	4.75	1.81	5.24	1.67	<.001*	−.28	5.00	1.76
Listening motives								
Relax	5.38	1.73	5.65	1.58	.036*	−.16	5.51	1.66
Pass the time	4.38	2.15	4.31	2.01	.642	.03	4.34	2.08
Reflect on life	4.19	1.92	4.60	2.05	.008*	−.21	4.39	2.00
Get energized	5.15	1.80	5.23	1.85	.565	−.04	5.19	1.82
Obtain company	3.46	1.96	3.75	2.10	.065	−.14	3.61	2.03
Influence emotion	4.83	1.89	4.38	2.11	.003*	.22	4.61	2.01
Interest in music	5.67	1.60	5.77	1.48	.375	−.06	5.72	1.54
Create atmosphere	5.43	1.60	4.83	1.78	<.001*	.35	5.13	1.72
Appreciate beauty	5.19	1.75	5.60	1.64	.002*	−.24	5.39	1.71
Social belonging	3.15	1.68	3.51	2.01	.014*	−.19	3.29	1.86
Listen to lyrics	4.59	1.88	5.17	1.66	<.001*	−.33	4.87	1.79
Enhance health	4.14	1.98	4.67	1.96	<.001*	−.27	4.40	1.99
Affirm identity	3.05	1.90	3.16	2.06	.462	−.06	3.10	1.98
Evoke memories	4.46	1.77	4.52	1.89	.658	−.03	4.49	1.83
Others' choice	3.22	1.75	2.61	1.74	<.001*	.35	2.92	1.77
Background	2.26	1.61	2.12	1.68	.280	.09	2.19	1.64

[a] Tukey HSD tests conducted separately for emotions, mechanisms, and listening motives.
* $p < .05$.

section). All mechanisms were rated higher in Collectivist cultures than in Individualist cultures—except *musical expectancy*, which was rated higher in Individualist cultures. Two of the effects were "moderate," four were "small," and three did not reach "small." Inspection of the right-most column in Table 2 shows that the five most prevalent mechanisms were: *rhythmic entrainment*, *aesthetic judgment*, *contagion*, *episodic memory*, and *evaluative conditioning* (all means >5).

Figure 2 shows the prevalence ratings as a function of individual countries for those mechanisms that showed: (a) a significant difference between the culture categories, (b) at least a "small" effect size, and (c) an overall prevalence of circa 4.00. The largest and most consistent effects across countries occurred for *episodic memory*, *contagion*, and *cognitive appraisal*. Regarding *musical expectancy*, the significant contrast is primarily explained by the low ratings in Kenya. In the case of *lyrics*, the difference was somewhat reduced by the high ratings in Australia and the low ratings in Portugal.

Prevalence of listening motives. A MANOVA with *culture category* as the independent variable and the 16 motives as the dependent variables revealed a significant multivariate effect, Wilks's = .81, $F(16, 651) = 9.47$, $p < .001$, which could be categorized as "small" ($\eta^2 = .19$). The lower section of Table 2 presents the Post hoc tests (Tukey's HSD), indicating a significant difference for nine of the 16 motives (56%). The

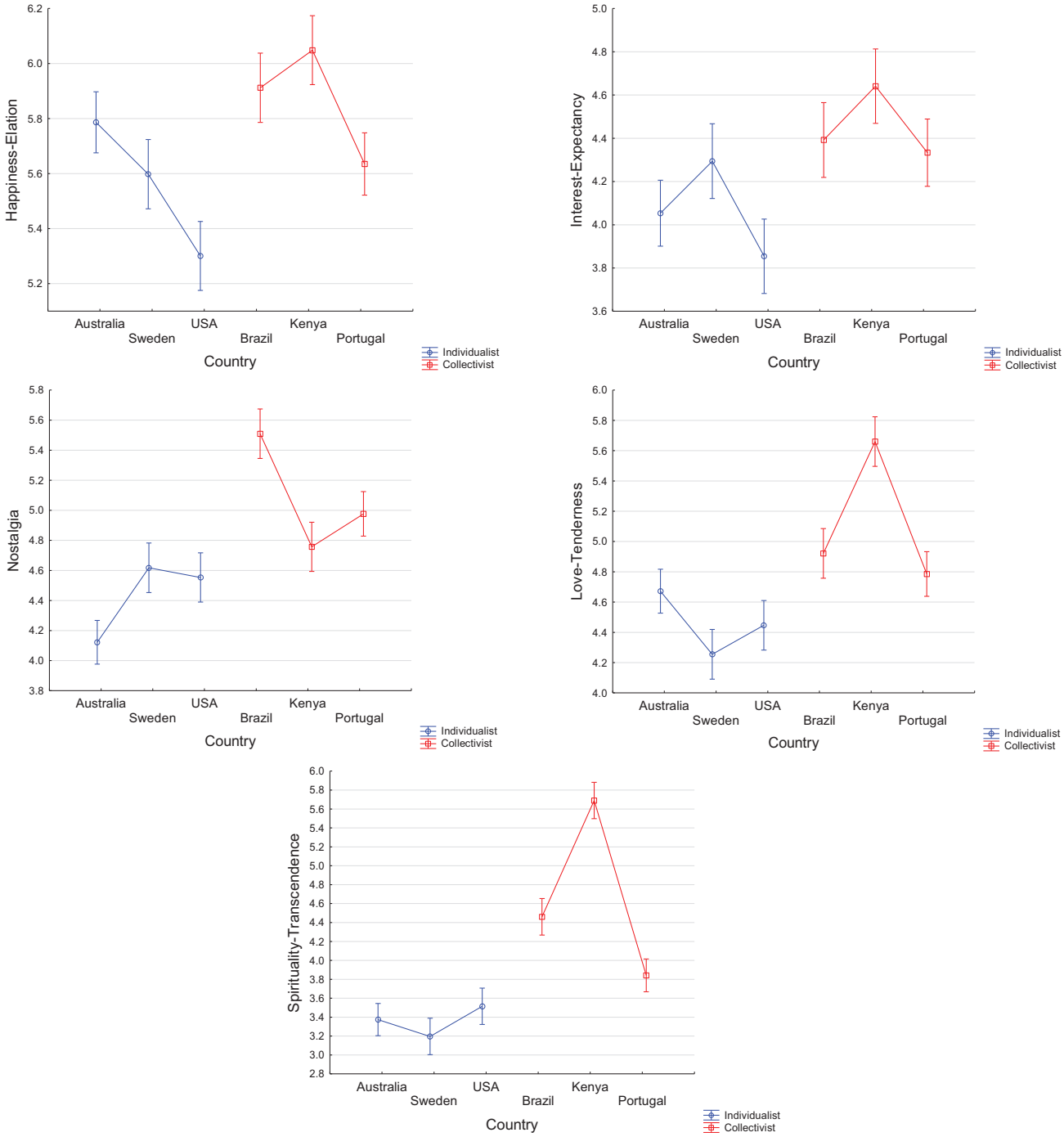

Figure 1. Means and standard errors for prevalence ratings of emotions as a function of individual countries. See the online article for the color version of this figure.

motives *relax*, *reflect on life*, *appreciate beauty*, *social belonging*, *listen to lyrics*, and *enhance health* were rated higher in Collectivist cultures, whereas the motives *influence emotions*, *create atmosphere*, and *others' choice* (i.e., passive exposure to another person's music) were rated higher in Individualist cultures. Seven effects were "small"; the remaining did not even reach "small." Further inspection of the right-most column in Table 2 shows that the top-five motives overall were *interest in the music*, *relax*, *appreciate beauty*, *get energized*, and *create atmosphere* (all means >5).

Figure 3 shows the prevalence ratings as a function of individual countries for those mechanisms that showed: (a) a significant

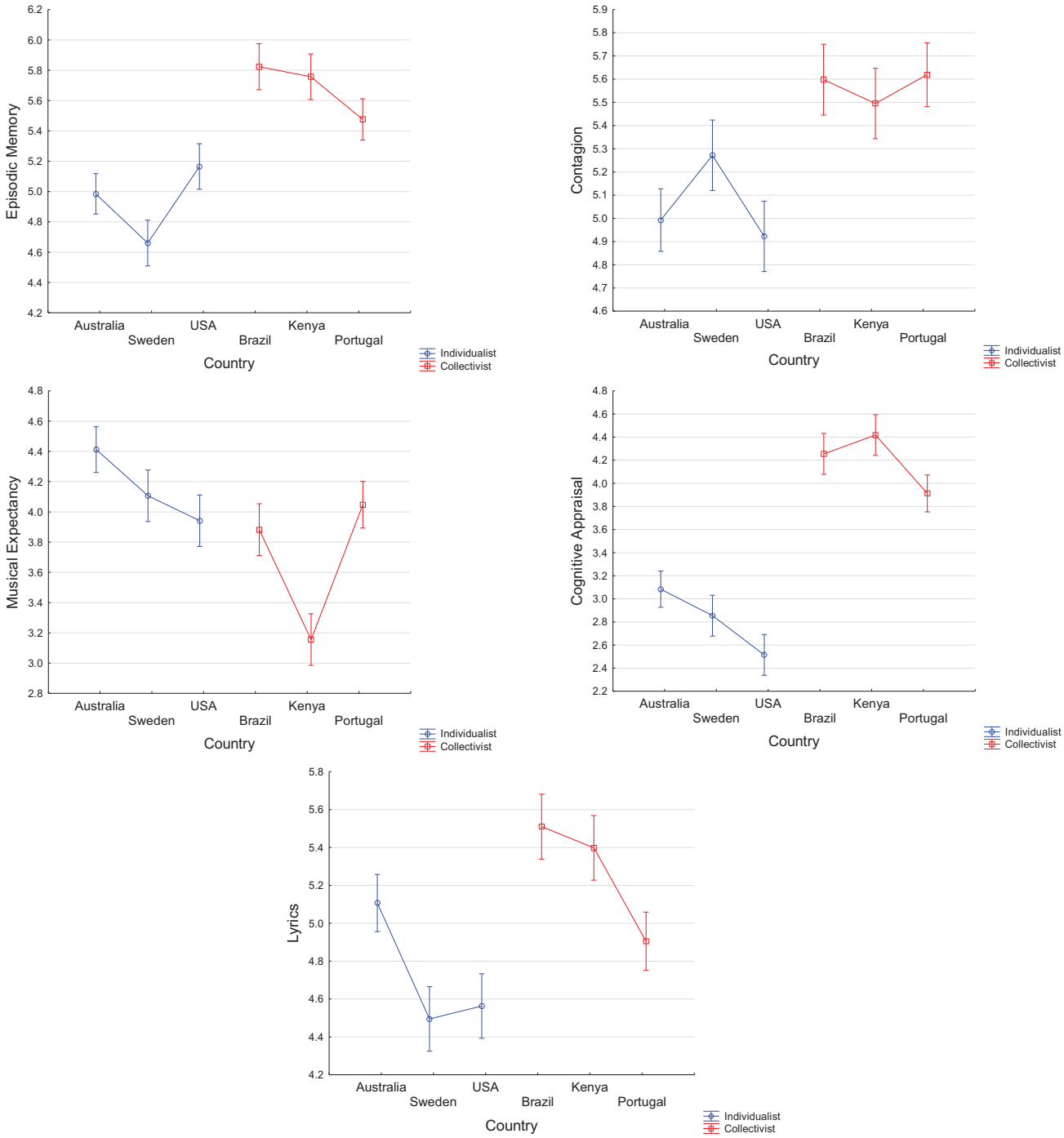

Figure 2. Means and standard errors for prevalence ratings of causal mechanisms as a function of individual countries. See the online article for the color version of this figure.

difference between the culture categories, (b) at least a "small" effect size, and (c) an overall prevalence of circa 4.00. Note that, apart from the motive *create atmosphere*, few of these effects were wholly consistent across countries.

Trait variables. Table 3 shows a summary of the statistically significant Pearson correlations between trait variables (SWLS, TIPI, Rumination & Reflection) and listeners' prevalence ratings of emotions, mechanisms, and listening motives, respectively (with Bonferroni correction for multiple tests). Correlations were computed separately for Individualist and Collectivist cultures. Circa 3% of the total number of correlations were significant, and the effect sizes of these were "small" in terms of Cohen's (1988)

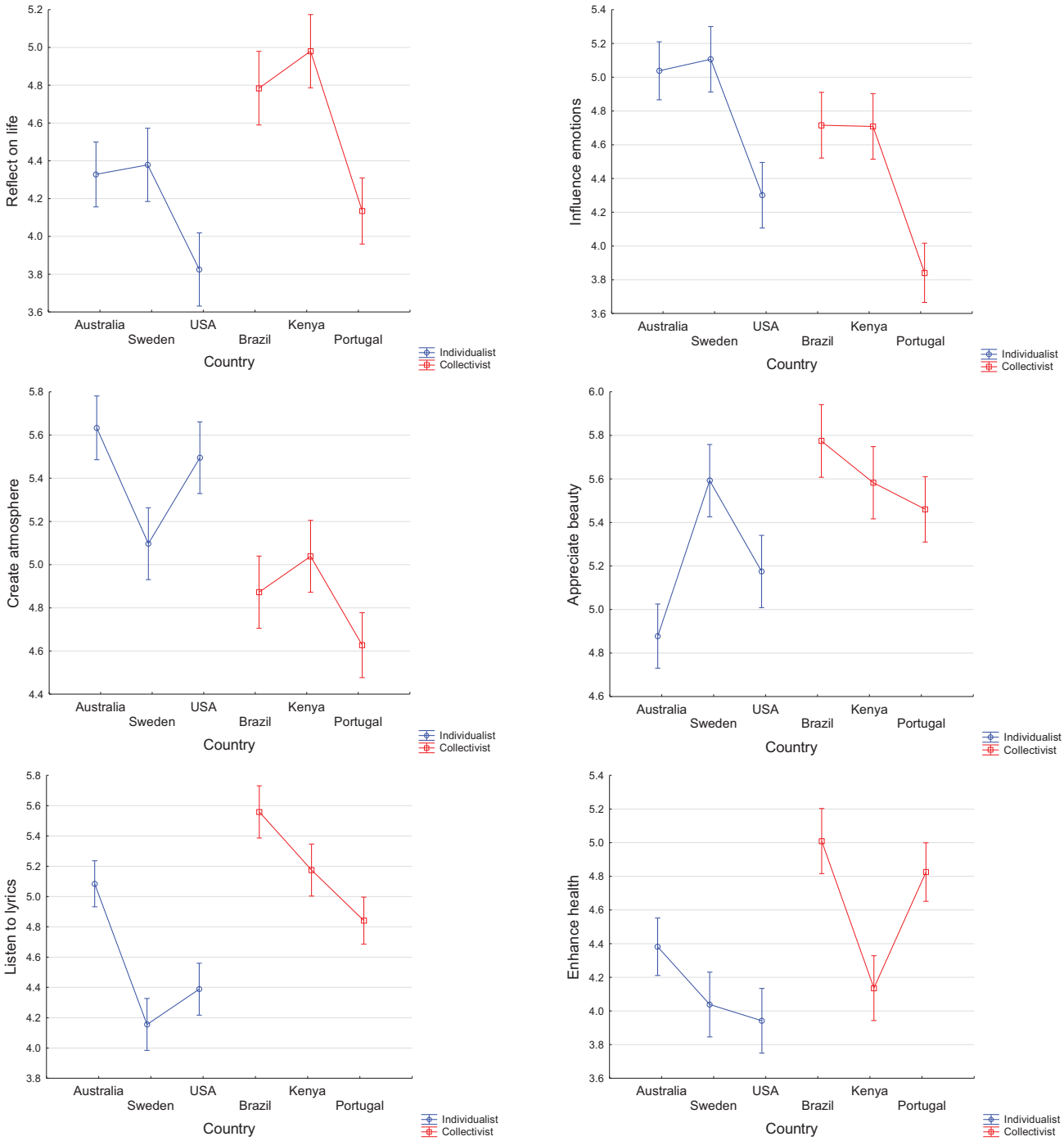

Figure 3. Means and standard errors for prevalence ratings of listening motives as a function of individual countries. See the online article for the color version of this figure.

guidelines. A somewhat larger number of correlations were significant for Individualist cultures than for Collectivist cultures. The most frequently involved trait was *Openness to experience*, followed by *Emotional stability*, and *Rumination*. However, only two of the correlations occurred for both culture categories, namely, *Rumination/sadness* and *Openness to experience/Contagion*.

Music and nostalgia. The final semantic items (see Appendix, items 19–21) focused on music, nostalgia, and health. A *t* test, between subjects, showed no significant difference in rated *overall* nostalgia prevalence in everyday life between Individualist ($M = 4.72$, $SD = 1.44$) and Collectivist cultures ($M = 4.78$, $SD = 1.49$), $t(666) = -0.51$, $p = .61$, $d = -0.04$. Both culture categories rated

Table 3
Significant Correlations (r) Between Trait Variables and Prevalence Ratings of Emotions, Mechanisms, and Listening Motives

Prevalence variable	Culture category	
	Individualist	Collectivist
Emotions[a]	Extraversion/Pride (.20)	Emotional stability/Calm (.22)
	Emotional stability/Sadness (−22)	Openness to experience/Spirituality (.20)
	Rumination/Sadness (.27)	Rumination/Sadness (.25)
	Life satisfaction/Anxiety (−.21)	
Mechanisms[b]	Openness to experience/Contagion (.19)	Openness to experience/Contagion (.21)
	Openness to experience/Imagery (.22)	
Listening motives[c]	Extraversion/Get energized (.23)	
	Emotional stability/Influence emotions (−.20)	
	Openness to experience/Create atmosphere (.20)	
	Rumination/Pass the time (.19)	

Note. For Individualist countries, $N = 337$; for Collectivist countries, $N = 331$.
[a] Bonferroni-corrected, from $\alpha = .05$ to $\alpha = .00042$. [b] Bonferroni-corrected, from $\alpha = .05$ to $\alpha = .00062$. [c] Bonferroni-corrected, from $\alpha = .05$ to $\alpha = .00039$.

overall nostalgia as very prevalent in everyday life. Similarly, there was no significant difference with regard to the belief that listening to music enhances one's well-being because both Individualist ($M = 6.10$, $SD = 1.17$) and Collectivist cultures ($M = 6.20$, $SD = 1.11$) gave similarly high ratings on this item, $t(666) = -1.05$, $p = .30$, $d = -0.09$. Conversely, there was a significant difference with respect to the rated importance of music-aroused nostalgia, where Collectivist cultures rated musical nostalgia as more important ($M = 5.09$, $SD = 1.58$) than did Individualist cultures ($M = 4.73$, $SD = 1.65$), $t(666) = -1.05$, $p = .003$, although the effect was "small" ($d = 0.22$).

Episodic Data

In this section, we focus on the specific musical emotion episodes that the participants were asked to recall (item 15). All listeners were able to recall a musical event, resulting in a total of 668 episodes. We first present the contextual variables, and then look at the emotions, mechanisms, and motives featured. The first item asked how much time had elapsed since the episode. The results indicated that 42% of the episodes had occurred within the last 24 hours; 39% had occurred within the last week; 12% had occurred within the last month; and 7% had occurred longer ago than 1 month. These data could be used to control for effects of retention interval on estimates of prevalence and emotion intensity. Computation of the Spearman rank order correlations between emotion (dichotomous coding) and time latency (ordinal variable) showed that no correlation accounted for more than 1% of the variance in prevalence, and the same was true for the correlations with emotion intensity ($\rho = .02$) and culture category (.03).

Concerning the *physical location* of the episodes, Cochran's Q test revealed a highly significant overall effect ($Q = 1740.30$, $df = 13$, $p < .001$), which confirms that the response frequencies were different.[7] (Tests in this section were not Bonferroni-corrected, due to the low statistical power of nonparametric tests.) Notably, 82% of the episodes featured one of the following four locations: "at home" (44%), "in a vehicle" (21%), "at work/school" (11%), and "outdoors" (6%). All remaining categories occurred in less than 1% of the episodes. The only significant difference between the two culture categories occurred for the location "at a restaurant," $\chi^2(1) = 4.66$, $p = .03$, $N = 668$, which was more frequent in Collectivist cultures (2%) than in Individualist cultures (0.2%). Note, however, that the number of observations was too low in one cell (<5) to estimate the probabilities with sufficient precision.

Moving on to the *activity* in the reported episodes, there was again a significant overall effect ($Q = 569.20$, $df = 13$, $p < .001$). The four most frequently occurring activities accounted for 64% of responses: "work/study" (23%), "focused music listening" (16%), "travel" (15%), and "relaxation" (10%). None of the remaining categories accounted for >8% of the responses. A comparison of the two culture categories revealed three significant differences: Episodes involving "work/study" were more frequent in Collectivist cultures (28%) than in Individualist cultures (19%), $\chi^2(1) = 8.25$, $p = .004$, $N = 668$; episodes involving "travel" were more frequent in Individualist cultures (19%) than in Collectivist cultures (11%), $\chi^2(1) = 7.28$, $p = .007$, $N = 668$; and, finally, episodes involving "physical activity" were more frequent in Individualist cultures (7%) than in Collectivist cultures (3%), $\chi^2(1) = 5.14$, $p = .02$, $N = 668$, but note that this category was chosen rarely overall.

As regards the *social context* of the episodes, there was a significant overall effect ($Q = 1248.60$, $df = 6$, $p < .001$), with the most common condition being "alone" (62%), followed by "partner or friend" (12%), "several friends or acquaintances" (8%), "family" (6%), "one or more strangers" (5%), "a large crowd" (5%), and "acquaintance or colleague" (2%). Chi-square tests showed no significant differences between Individualist and Collectivist cultures.

The music heard was *familiar* to the listener in 89% of the episodes, overall, and there was no significant difference between Individualist (89%) and Collectivist cultures (88%) in this regard, as confirmed by a chi-square test, $\chi^2(1) = .32$, $p = .57$, $N = 667$. However, with regard to *music choice* there was a highly signifi-

[7] Cochran's Q test is a nonparametric test for three or more matched sets of frequencies or proportions where data are supplied as dichotomous (0/1) variables (Conover, 1999).

cant difference ($\chi^2(1) = 16.34$, $p < .001$, $N = 667$), with a slightly higher proportion of self-chosen music for Individualist cultures (68%) than for Collectivist cultures (53%). *Liking* of the music featured in the episodes (rated on a scale 1–7) was generally high ($M = 6.36$, $SD = 1.00$), and did not differ significantly between Individualist ($M = 6.39$, $SD = 0.99$) and Collectivist ($M = 6.33$, $SD = 1.02$) cultures, $F(1, 652) = 0.50$, $p = .48$, $\eta^2 = .001$.

There was a significant overall effect with regard to the *source* of the music featured in the episodes ($Q = 320.90$, $df = 6$, $p < .001$). The most frequent source was "computer" (29%), closely followed by "mobile device" (27%, e.g., cell phones, I-pods). Somewhat less frequent were "radio" (15%), "home stereo" (14%), "live music" (10%), "television" (4%), and "public loudspeaker" (1%). Chi-square tests revealed two differences between the culture categories. More specifically, music from a "computer" was more frequent in Collectivist cultures (35%) than in Individualist cultures (23%), $\chi^2(1) = 11.47$, $p < .001$, $N = 668$. Music from a "mobile device," in contrast, was more frequent in Individualist cultures (33%) than in Collectivist cultures (21%), $\chi^2(1) = 12.97$, $p < .001$, $N = 668$.

The emotions experienced in the episodes were reported using the same 15 categories as were included in the semantic section of the survey. Figure 4 presents the results, in terms of the relative occurrence of each emotion as a function of culture category. Cochran's Q test revealed a highly significant overall effect for the emotions ($Q = 1171.05$, $df = 15$, $p < .001$). Chi-square tests of the specific contrasts between the culture categories showed a significant difference for five of the 15 emotions (33%). Thus, *happiness–elation*, *nostalgia–longing*, and *spirituality–transcendence* were all more frequent in Collectivist episodes, whereas *sadness–melancholy* and *admiration–awe* were more frequent in Individualist episodes, $\chi^2(1) = 4.69–8.71$, $ps = .03–.003$, $N = 668$. As seen in Figure 4, the five most common emotion categories, overall, were *happiness–elation*, *sadness–melancholy*, *nostalgia–longing*, *pleasure–enjoyment*, and *calm–contentment*.

Mean reported emotion intensity of the episodes on a scale from 1 to 7 was 5.22 ($SD = 1.24$, $Min = 2$, $Max = 7$), suggesting that the majority of episodes were quite intense. Indeed, 74% of the episodes involved an intensity rating of 5 or more. There was a very small albeit statistically significant difference in reported intensity between the two culture categories, $F(1, 665) = 10.22$, $p = .002$, $\eta^2 = .015$, with Collectivist countries reporting a higher intensity ($M = 5.39$, $SD = .07$) than Individualist countries ($M = 5.08$, $SD = .07$). However, note that the intensity ratings do not involve exactly the same emotions in the two groups.

There was a significant overall effect with respect to self-reported *causes* of emotions (e.g., mechanisms) in the musical episodes ($Q = 1{,}182.75$, df = 11, $p < .001$). Figure 5 shows the frequency of each cause as a function of culture category. Chi-square tests of the specific contrasts between the two culture categories indicated a significant difference for five of the causes. *Episodic memory* was more frequent in Collectivist episodes than in Individualist episodes, $\chi^2(1) = 8.60$, $p = .003$, $N = 668$. In contrast *visual imagery*, *contagion*, *expectancy*, and *lyrics* were all more frequent in Individualist episodes than in Collectivist episodes, $\chi^2(1) = 5.42–19.42$, $ps = .02–.001$, $N = 668$.

In the musical episodes where the emotion was thought to have been caused by *episodic memory* (45% of the total), the emotional tone of the memory was "mixed" in 47%, "positive" in 28%, and "negative" in 25% (overall). However, there was a difference between the culture categories, as confirmed by a chi-square test, $\chi^2(1) = 51.92$, $p < .001$, $N = 207$. Specifically, negative memories were more common in Collectivist episodes (40%) than in Individualist episodes (6%). Conversely, positive memories were more common in Individualist episodes (50%) than in Individualist episodes (11%).

Regarding the listening motives, there was a significant overall effect ($Q = 525.79$, $df = 16$, $p < .001$). The most commonly reported listening motives in the episodes, across cultures, was "relax" (27%), "interest in the music itself" (26%), "reflect on life"

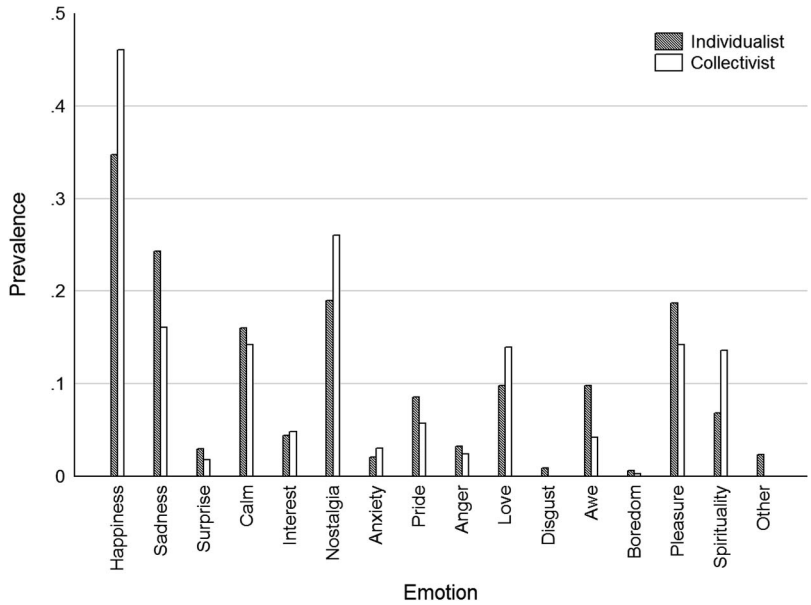

Figure 4. Prevalence of musical emotions in individualist and collectivist countries (Episodic data).

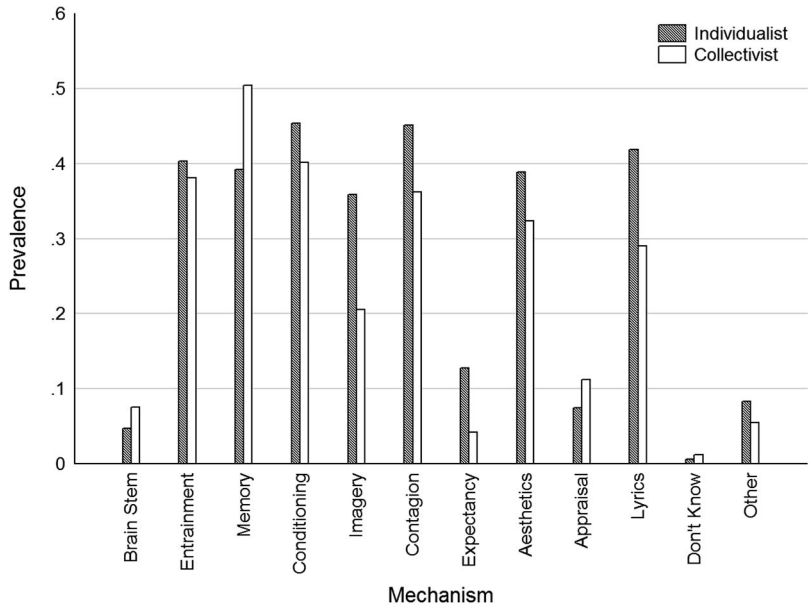

Figure 5. Prevalence of causal mechanisms in individualist and collectivist countries (Episodic data).

(25%), "energize" (23%), and "pass the time" (22%). Figure 6 shows the relative occurrence of each motive as a function of culture category. Chi-square tests revealed a significant difference between the culture categories for eight of the 17 motives (= 47%). As seen in Figure 6, the Collectivist episodes included a significantly larger proportion of cases where music "simply occurred in the background" than did the Individualist episodes, $\chi^2(1) = 14.50$, $p < .001$, $N = 668$. The Individualist episodes, in turn, included a larger proportion of cases where the listener motive was to "relax," "pass the time," "obtain company," "influence emotion," "create atmosphere" (note the large difference), or was due to an "interest in the music," $\chi^2(1) = 4.18–33.53$, $ps = .04–.001$, $N = 668$. Furthermore, Individualist episodes more frequently involved the "other motive" category, $\chi^2(1) = 5.62$, $p = .02$, $N = 668$, the most common "other" responses being "because I took part in a musical activity" (singing in a choir or playing an instrument). Note, however, that the "other" category accounted for only 10% of the episodes overall.

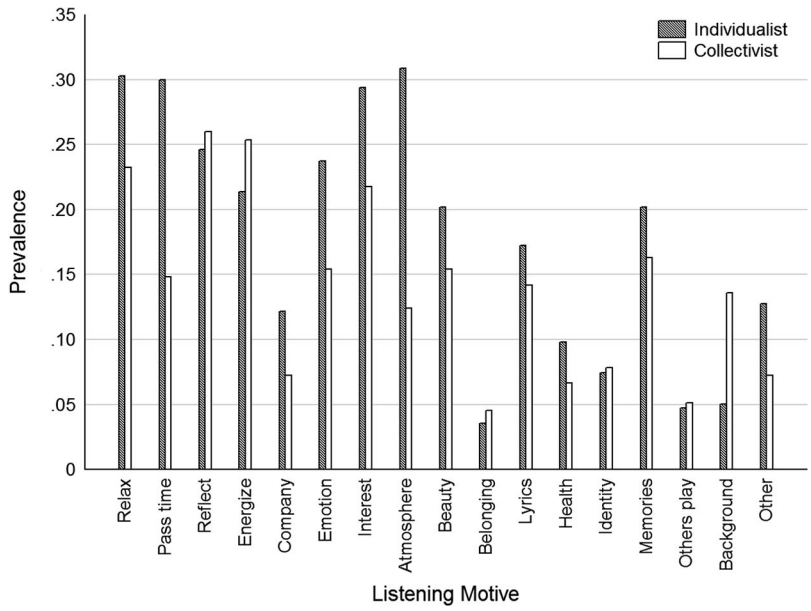

Figure 6. Prevalence of listening motives in individualist and collectivist countries (Episodic data).

Discussion

The purpose of this study was to investigate the prevalence of (a) emotional reactions to music, (b) various psychological mechanisms, and (c) listening motives in a cross-cultural sample of music listeners, with focus on the Individualism–Collectivism dimension and the role of musical nostalgia. In addition, we aimed to explore how these variables were related to individual differences in personality traits.

Summary of Findings

Semantic reports. The semantic reports involved frequency-based ratings of prevalence by participants. Results clearly showed that there *were* cross-cultural differences regarding the prevalence of emotions, mechanisms, and listening motives. The observed differences were, however, fewer and smaller than expected, considering the enormous heterogeneity of music across different societies (Clayton, 2016). Across the three main variables explored, roughly 63% of the contrasts between Individualist and Collectivist cultures were significant; 92% of these differences did not exceed a "small" effect size (Cohen, 1988). In general, there were larger differences between the different emotions, mechanisms, and motives, than between the two culture categories, indicating that the overall patterns of prevalence were relatively similar across cultures. This is in line with previous findings that suggest that for emotions, cross-cultural similarities tend to be larger than cross-cultural differences (Berry et al., 2011; Scherer, 1997; Scherer, Wallbott, Matsumoto, & Kudoh, 1988).

Surprisingly, there were hardly any differences concerning overall prevalence of music listening and emotions—apart from a higher proportion who listened >40 hr per week in Collectivist cultures. There were, however, some differences for specific emotions. The largest and most consistent effects across countries occurred for *nostalgia–longing*, *love–tenderness* and *spirituality–transcendence*, which were rated as more frequent in Collectivist cultures than in Individualist cultures.

As far as mechanisms are concerned, the semantic data indicated that *episodic memory*, *contagion*, and *cognitive appraisal* were more prevalent in Collectivist cultures. In contrast, *musical expectancy* was more prevalent in Individualist cultures. The findings for listening motives did not reveal any differences between culture categories that were consistent across the countries in each category, with the exception of the motive to "create atmosphere" which was more prevalent in Individualist cultures.

More generally, we can conclude that the results from the semantic reports confirm our tentative hypothesis that Collectivist cultures would report a higher prevalence of *nostalgia–longing* than Individualist cultures. Collectivist cultures also attached a higher importance to musical nostalgia and reported a higher prevalence of the mechanism most associated with nostalgia (i.e., *episodic memory*). These findings are all the more interesting, considering that they did *not* report a higher prevalence of general (nonmusical) nostalgia.

Cultural differences need to be interpreted in the light of differences between individual listeners. Effect sizes (Cohen's *d*, *r*) in the present study indicated that the distinction between Collectivist and Individualist cultures explained more of the variance in rated prevalence of emotions, mechanisms and listening motives than did the various trait variables (SWLS, TIPI, Rumination & Reflection). Still, there were some significant correlations. Arguably, the most promising variables were the traits *Openness to experience* and *Rumination*. Thus, for instance, *Openness to experience* was correlated with the prevalence of the *Contagion* mechanism, and *Rumination* was correlated with the prevalence of *sadness-melancholy*. Both traits have been linked to emotional reactions to music in previous research (Garrido, 2009; Juslin et al., 2011; McCrae, 2007). *Emotional stability* was further negatively correlated with *sadness–melancholy* though positively correlated with *calm–contentment* in Individualist and Collectivist cultures, respectively, which is consistent with previous results in both musical (Juslin et al., 2011) and nonmusical (Costa & McCrae, 1980; Rusting & Larsen, 1997) contexts.

Episodic reports. The episodic data indicated that the musical events aroused primarily positive emotions of a high intensity. The episodes featured mostly familiar and well-liked music which tended to be self-selected; they occurred mostly when the listener was alone—typically at home, in a vehicle, at work/school, or outdoors; they most frequently involved the activities work/study, travel, music listening, and relaxation; and they featured a variety of underlying mechanisms and listening motives. There were few differences between the culture categories with regard to contextual factors (e.g., location, activity, social context, source of music, choice of music, liking, familiarity), which means that the data provided few clues to help us explain the cross-cultural differences obtained in the semantic reports (discussed earlier). However, there were some notable differences involving the three main variables studied. These data were mainly consistent with the semantic data, showing, for instance, that the emotions *nostalgia–longing*, *spirituality–transcendence*, and *happiness–elation*, and the mechanism *episodic memory*, were more prevalent in Collectivist cultures than in Individualist cultures, whereas the emotions *sadness–melancholy* and *admiration–awe*, and the mechanism *musical expectancy*, were more prevalent in Individualist cultures. For the memories, we noted a clear difference in valence. Negative memories were more common in Collectivist cultures, whereas positive memories were more common in Individualist cultures. The frequent occurrence of negative memories might seem puzzling in view of the link between episodic memory and nostalgia, the latter of which is usually regarded as positively tinged, or at least "bitter–sweet" (Wildschut, Sedikides, Arndt, & Routledge, 2006). It has been argued though that unhappy memories can also evoke nostalgia, if the reminiscence heightens one's sense of self and connectedness to other people (Batcho, 2007; see also Vuoskoski, Thompson, McIlwain, & Eerola, 2012).

However, there were also some inconsistencies. Similarly to the finding in a previous study (Juslin et al., 2011), the episodic reports here included a larger proportion of *sadness–melancholy* than did the semantic reports. One may speculate that the participants display a "positivity bias" in their semantic estimates such that they underestimate the extent to which they experience negative emotions like *sadness* to music in everyday life. This bias may not be present in reports of the most *recent* experience of an emotion, as such reports rely on episodic memory (Robinson & Clore, 2002). Another inconsistency is that the semantic data suggested that the mechanism *contagion* is more prevalent in Collectivist cultures, whereas the episodic data suggested that *contagion* is

more prevalent in Individualist cultures. Such inconsistencies can hopefully be resolved in future research.

Limitations and Prospects

This web-survey shares many of the same limitations as other types of surveys. First of all, it focuses merely on self-report. This means that participants only report what they can or are willing to report, and their responses can be influenced by social desirability and demand characteristics (cf. Visser et al., 2000). However, the reliability of self-reports depends on the types of questions asked. For example, it may be difficult for listeners to monitor reliably the precise processes that underlie their emotional reactions, because the information-processing involved is at least partly subconscious (see Juslin, 2013). Hence, reports concerning causal mechanisms need to be interpreted with some caution. On the other hand, listeners should be well-equipped to provide reliable answers to questions about emotions and listening motives in everyday life.

Another limitation of the present survey is that it relied on a convenience sample, rather than a random and representative sample of listeners (Visser et al., 2000). Self-selection bias is clearly an issue, and has influenced the characteristics of the sample. First, the sample included mainly students or employed persons with higher education. Second, it can arguably be assumed that the participants in all subsamples involved people who are more interested in music than the overall population, and this should be taken into account in the interpretation. Notably, certain of the trends in the present study differ from those of a previous survey study that used a random and representative sample of listeners (Juslin et al., 2011). In that study, the most frequent music listening motive was "to relax". "Interest in the music itself" occurred only in seventh place (although it was correlated with musical training). In the present survey, which featured a self-selected sample, "interest in the music itself" was among the most highly ranked motives. To be fair, it would be a tall order to obtain a random sample of listeners from all six countries studied here. Nonetheless, is important to observe that the results may only be generalizable to highly educated people who have an interest in music. Future research should ideally explore the same questions using more diverse samples.

In addition to the above issues, there are also limitations of the survey approach, more generally. Surveys are effective, in that many questions about a topic may be answered by a large sample of participants, and the use of standardized questions ensures that similar data can be collected from various groups so that they can be systematically compared. However, standardization also renders questionnaires inflexible because the study design has to remain unchanged throughout the data collection. In addition, it could be argued that surveys tend to address issues in a somewhat "superficial" manner. A better understanding of how emotional reactions to music are shaped by the cultural context may require a qualitative approach—for instance using in-depth interviews to study how particular mechanisms are manifested within a specific cultural setting, so that individual uses of music can be captured at adequate levels of detail, complexity, and nuance (Barradas, 2016).

Implications for Future Research

This is to the best of our knowledge the first study to measure the prevalence of specific emotions, mechanisms, and listening motives across different cultures. Cross-cultural data are important in order to increase the generalizability of findings. They help to specify "boundary conditions" for effects that have been demonstrated in the laboratory (Juslin et al., 2014, 2015) or in field settings within a single culture (Juslin et al., 2008, 2011). One major implication of the present study is that the broad patterns of prevalence of emotions and mechanisms may be quite similar across cultures. Indeed, comparing previous estimates of prevalence from studies that involved "representative" samples of listeners (Juslin et al., 2011), situations (Juslin et al., 2008), or musical stimuli (Juslin et al., 2016; Liljeström, Juslin, & Västfjäll, 2013) from only a single culture with the present cross-cultural sample, the trends are strikingly similar: all studies suggest that music evokes an emotion in about 50% of the episodes; the emotions are mostly positive; they include both basic (e.g., *happiness*, *sadness*) and complex (e.g., *nostalgia*, *awe*) emotions; and all of the psychological mechanisms proposed in the BRECVEMA framework (Juslin, 2013) appear to occur at least occasionally—although some mechanisms (e.g., rhythmic entrainment, episodic memory, contagion, aesthetic judgment) occur more frequently than others.

Overall, the findings imply that essentially the same psychological mechanisms occur across different cultures, even though the relative prevalence may vary. This would seem to support the notion that the mechanisms are biologically based. Thus, we argue that theories of mechanisms could provide the necessary "bridge" between bio-logical and constructionist approaches, by helping to delimitate what is "biologically constrained" and what is "socially constructed" in specific instances of emotion (Juslin, 2012). In practice though, neither cross-cultural similarity or difference may be taken at face value as support for a biological or cultural interpretation, without further qualifying evidence. In the present study, we need to clearly acknowledge that the found links with the Individualism–Collectivism dimension are correlational and do not specify the causes of the obtained differences (Oyserman & Lee, 2008). Plausible causes include differences in economic resources (e.g., affecting the use of mobile devices), types of music structure (e.g., rhythmic/percussive vs. melodic/harmonic), and nature of musical behaviors (e.g., participatory vs. presentational).

Yet, the present study suggests that the Individualism–Collectivism dimension is useful in accounting for cross-cultural differences in musical emotions. Looking broadly at the three main variables investigated, we arguably observed more consistent effects of culture category across countries for emotions and mechanisms, than for listening motives, suggesting that the latter are more "country-specific" in nature. The reasons for this remain to be investigated, but it can reflect that mechanisms and emotion categories are more biologically based than are the specific uses of music in society. The latter could be more "fluid" and subject to technological developments (e.g., mobile music devices) and trends in society.

An important finding in the semantic data was that *nostalgia–longing*, *love–tenderness*, and *spirituality–transcendence* were rated as more prevalent in Collectivist cultures than in Individualist cultures. How are we to interpret these findings? They are

consistent with the notion that Collectivist cultures value "low-arousal positive emotions" to a relatively larger degree than do Individualist cultures, who tend to prefer "high-arousal positive emotions." Tsai, Knutson, and Fung (2006) submit that Individualists try to alter the environment to fit their own needs, whereas Collectivists rather try to adjust their own needs to fit those of the environment. Because low-arousal states promote attention to environmental stimuli, people with adjustment goals should generally prefer low-arousal positive states (Schupp, Cuthbert, Bradley, Birbaumer, & Lang, 1997).

The above emotions (*nostalgia*, *love*, *spirituality*) also appear to have in common that they are in some way linked to "social embeddedness" (e.g., social belonging, social identity, social relations). As suggested in the Introduction, higher prevalence of musical nostalgia in Collectivist cultures is consistent with the notion that these cultures feature a larger number of people who resist change and modernity and for whom nostalgia can serve the function of preserving social identity through reliving one's past (Shaw & Chase, 1989). Future research may be aimed at exploring exactly how nostalgia in responses to music can serve to enhance well-being and health in the flow of everyday life (MacDonald et al., 2012).

Whereas *love* typically involves social relatedness to other individuals, *spirituality* may involve relatedness to "a higher power." The latter emotion was especially prevalent in Kenya, where music and religion are intertwined (Kigunda, 2007). The two most commonly preferred musical genres in the country—gospel and hip-hop—are used by churches to evangelize youth (Kagema, 2013). Though it remains to be investigated, it is possible that the higher prevalence of the mechanism *cognitive appraisal* in Collectivist cultures—including Kenya—is related to achieving the goal of "pleasing God" through music listening.

Contextual variables mapped in the episodic data provided few clues concerning how to explain the found differences between the culture categories. Explanations must probably be sought at the level of more specific interactions between the listener, the cultural context, and the "affordances" of specific music genres. It is arguably at this nexus that the emotions, mechanisms, and listening motives most clearly come together to produce the quite complex phenomenon that we call musical experience.

References

Allen, R. E. (Ed.). (1992). *The concise Oxford English dictionary*. Oxford, UK: Clarendon Press.

Andrews, F. M., & Withey, S. B. (1976). *Social indicators of well-being*. New York, NY: Plenum Press. http://dx.doi.org/10.1007/978-1-4684-2253-5

Balkwill, L.-L., & Thompson, W. F. (1999). A cross-cultural investigation of the perception of emotion in music: Psychophysical and cultural cues. *Music Perception, 17,* 43–64. http://dx.doi.org/10.2307/40285811

Barradas, G. T. (2016). *Understanding nostalgia and sadness in Fado music: A qualitative approach to the psychological mechanisms underlying musical emotions*. Manuscript submitted for publication.

Barradas, G. T., Ovsiannikow, M., & Juslin, P. N. (2016). *Why do people listen to music that makes them feel sad?* Manuscript submitted for publication.

Batcho, K. I. (2007). Nostalgia and the emotional tone and content of song lyrics. *The American Journal of Psychology, 120,* 361–381.

Baumgartner, H. (1992). Remembrance of things past: Music, autobiographical memory, and emotion. *Advances in Consumer Research Association for Consumer Research, 19,* 613–620.

Becker, J. (2004). *Deep listeners: Music, emotion, and trancing*. Bloomington, IN: Indiana University Press.

Berry, J. W., Poortinga, Y. H., Breugelmans, S. M., Chasiotis, A., & Sam, D. (2011). *Cross-cultural psychology: Theory and applications* (3rd ed.). Cambridge, United Kingdom: Cambridge University Press. http://dx.doi.org/10.1017/CBO9780511974274

Blacking, J. (1973). *How musical is man?* Seattle, WA: University of Washington Press.

Blair, M. E., & Shimp, T. A. (1992). Consequences of an unpleasant experience with music: A second-order negative conditioning perspective. *Journal of Advertising, 21,* 35–43. http://dx.doi.org/10.1080/00913367.1992.10673358

Boer, D., & Fischer, R. (2012). Towards a holistic model of functions of music listening across cultures: A culturally decentred qualitative approach. *Psychology of Music, 40,* 179–200. http://dx.doi.org/10.1177/0305735610381885

Brandão, M. L., Melo, L. L., & Cardoso, S. H. (1993). Mechanisms of defense in the inferior colliculus. *Behavioral Brain Research, 58,* 49–55. http://dx.doi.org/10.1016/0166-4328(93)90089-9

Brewer, M. B., & Chen, Y. R. (2007). Where (who) are collectives in collectivism? Toward conceptual clarification of individualism and collectivism. *Psychological Review, 114,* 133–151. http://dx.doi.org/10.1037/0033-295X.114.1.133

Campbell, D. T. (1970). Natural selection as an epistemological model. In R. Naroll & R. Cohen (Eds.), *A handbook of method in cultural anthropology* (pp. 51–85). New York, NY: National History Press.

Clayton, M. (2016). The social and personal functions of music in cross-cultural perspective. In S. Hallam, I. Cross, & M. Thaut (Eds.), *The Oxford handbook of music psychology* (2nd ed., pp. 47–59). Oxford, United Kingdom: Oxford University Press.

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). New York, NY: Academic Press.

Conover, W. J. (1999). *Practical non-parametric statistics* (3rd ed.). New York, NY: Wiley.

Costa, P. T., Jr., & McCrae, R. R. (1980). Influence of extraversion and neuroticism on subjective well-being: Happy and unhappy people. *Journal of Personality and Social Psychology, 38,* 668–678. http://dx.doi.org/10.1037/0022-3514.38.4.668

Costa, P. T., Jr., & McCrae, R. R. (1992). *Revised NEO Personality Inventory (NEO PI-R) and NEO Five-factor Inventory (NEO-FFI): Professional manual*. Odessa, FL: Psychological Assessment Resources.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985). The Satisfaction With Life Scale. *Journal of Personality Assessment, 49,* 71–75. http://dx.doi.org/10.1207/s15327752jpa4901_13

Dowling, W. J., & Harwood, D. L. (1986). *Music cognition*. New York, NY: Academic Press.

Eggebrecht, R. (1983). *Sprachmelodie und musikalische Forschungen im Kulturvergleich* [Speech melody and music research in cross-cultural comparison] (Doctoral dissertation). University of Munich, München, Germany.

Ekman, P. (1992). An argument for basic emotions. *Cognition and Emotion, 6,* 169–200. http://dx.doi.org/10.1080/02699939208411068

Ellsworth, P. C. (1994). Levels of thought and levels of emotion. In P. Ekman & R. J. Davidson (Eds.), *The nature of emotion* (pp. 192–196). Oxford, United Kingdom: Oxford University Press.

Feld, S. (1982). *Sound and sentiment: Birds, weeping, poetics, and song in Kaluli expression*. Philadelphia, PA: University of Pennsylvania Press.

Ferguson, C. J. (2009). An effect size primer: A guide for clinicians and researchers. *Professional Psychology: Research and Practice, 40,* 532–538. http://dx.doi.org/10.1037/a0015808

Frijda, N. H., & Scherer, K. R. (2009). Affect (psychological perspectives).

In D. Sander & K. R. Scherer (Eds.), *The Oxford companion to emotion and the affective sciences* (p. 10). Oxford, United Kingdom: Oxford University Press.

Fritz, T., Jentschke, S., Gosselin, N., Sammler, D., Peretz, I., Turner, R., . . . Koelsch, S. (2009). Universal recognition of three basic emotions in music. *Current Biology, 19,* 573–576. http://dx.doi.org/10.1016/j.cub.2009.02.058

Gabrielsson, A. (2001). Emotions in strong experiences with music. In P. N. Juslin & J. A. Sloboda (Eds.), *Music and emotion: Theory and research* (pp. 431–449). Oxford, United Kingdom: Oxford University Press.

Gabrielsson, A. (2011). *Strong experiences with music: Music is much more than just music*. Oxford, United Kingdom: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199695225.001.0001

Gantz, W., Gartenberg, H. M., Pearson, M. L., & Schiller, S. O. (1978). Gratifications and expectations associated with pop music among adolescents. *Popular Music and Society, 6,* 81–89.

Garrido, S. (2009). Rumination and sad music: A review of the literature and a future direction. In C. Stevens, E. Schubert, B. Kruithof, K. Buckley, & S. Fazio (Eds.), In *Proceedings of the 2nd international conference on music communication science* (pp. 20–23). Sydney, New South Wales, Australia: HCSNet, University of Western Australia.

Garrido, S., & Schubert, E. (2011). Negative emotion in music: What is the attraction? A qualitative study. *Empirical Musicology Review, 6,* 214–230.

Geertz, C. (1983). *The interpretation of cultures*. New York, NY: Basic Books.

Gerra, G., Zaimovic, A., Franchini, D., Palladino, M., Giucastro, G., Reali, N. K., . . . Brambilla, F. (1998). Neuroendocrine responses of healthy volunteers to 'techno-music': Relationships with personality traits and emotional state. *International Journal of Psychophysiology, 28,* 99–111. http://dx.doi.org/10.1016/S0167-8760(97)00071-8

Gosling, S., Rentfrow, P., & Swann, W., Jr. (2003). A very brief measure of the Big Five personality domains. *Journal of Research in Personality, 37,* 504–528. http://dx.doi.org/10.1016/S0092-6566(03)00046-1

Gregory, A. H., & Varney, N. (1996). Cross-cultural comparisons in the affective response to music. *Psychology of Music, 24,* 47–52. http://dx.doi.org/10.1177/0305735696241005

Gross, J. J. (2008). Emotion regulation. In M. Lewis, J. M. Haviland-Jones, & L. F. Barrett (Eds.), *Handbook of emotions* (3rd ed, pp. 497–512). New York, NY: Guilford Press.

Gundlach, R. H. (1932). A quantitative analysis of Indian music. *The American Journal of Psychology, 44,* 133–145. http://dx.doi.org/10.2307/1414960

Gundlach, R. H. (1935). Factors determining the characterization of musical phrases. *The American Journal of Psychology, 47,* 624–643. http://dx.doi.org/10.2307/1416007

Harrer, G., & Harrer, H. (1977). Music, emotion, and autonomic function. In M. Critchley & R. A. Henson (Eds.), *Music and the brain: Studies in the neurology of music* (pp. 202–216). London, United Kingdom: William Heinemann.

Hepper, E. G., Wildschut, T., Sedikides, C., Ritchie, T. D., Yung, Y. F., Hansen, N., . . . K Zhou, X. (2014). Pancultural nostalgia: Prototypical conceptions across cultures. *Emotion, 14,* 733–747. http://dx.doi.org/10.1037/a0036790

Hodges, D., & Sebald, D. (2011). *Music in the human experience: An introduction to music psychology*. New York, NY: Routledge.

Hofstede, G. (1983). Dimensions of national cultures in fifty countries and three regions. In J. B. Deregowski, S. Dziurawiec, & R. C. Annis (Eds.), *Expiscations in cross-cultural psychology* (pp. 335–355). Lisse, the Netherlands: Swets and Zeitlinger.

Hofstede, G. (2001). *Culture's consequences: Comparing values, behaviors, institutions and organizations across nations* (2nd ed.). Thousand Oaks, CA: Sage.

Izard, C. E. (1977). *The emotions*. New York, NY: Plenum Press.

Janata, P. (2009). The neural architecture of music-evoked autobiographical memories. *Cerebral Cortex, 19,* 2579–2594. http://dx.doi.org/10.1093/cercor/bhp008

Janata, P., Tomic, S. T., & Rakowski, S. K. (2007). Characterization of music-evoked autobiographical memories. *Memory, 15,* 845–860. http://dx.doi.org/10.1080/09658210701734593

Juslin, P. N. (2000). *Vocal expression and musical expression: Parallels and contrasts*. In A. Kappas (Ed.), In *Proceedings of the 16th conference of the international society for research on emotions* (pp. 281–284). Quebec City, Quebec, Canada: ISRE Publications.

Juslin, P. N. (2005, July, 11–15). *How does music arouse emotions?* Paper presented at the Thirteenth Conference of the International Society for Research on Emotions. Bari, Italy.

Juslin, P. N. (2012). Are musical emotions invariant across cultures? *Emotion Review, 4,* 283–284. http://dx.doi.org/10.1177/1754073912439773

Juslin, P. N. (2013). From everyday emotions to aesthetic emotions: Towards a unified theory of musical emotions. *Physics of Life Reviews, 10,* 235–266. http://dx.doi.org/10.1016/j.plrev.2013.05.008

Juslin, P. N., Barradas, G., & Eerola, T. (2015). From sound to significance: Exploring the mechanisms underlying emotional reactions to music. *The American Journal of Psychology, 128,* 281–304. http://dx.doi.org/10.5406/amerjpsyc.128.3.0281

Juslin, P. N., Harmat, L., & Eerola, T. (2014). What makes music emotionally significant? Exploring the underlying mechanisms. *Psychology of Music, 42,* 599–623. http://dx.doi.org/10.1177/0305735613484548

Juslin, P. N., & Laukka, P. (2004). Expression, perception, and induction of musical emotions: A review and a questionnaire study of everyday listening. *Journal of New Music Research, 33,* 217–238. http://dx.doi.org/10.1080/0929821042000317813

Juslin, P. N., Liljeström, S., Laukka, P., Västfjäll, D., & Lundqvist, L.-O. (2011). Emotional reactions to music in a nationally representative sample of Swedish adults: Prevalence and causal influences. *Musicae Scientiae, 15,* 174–207. http://dx.doi.org/10.1177/1029864911401169

Juslin, P. N., Liljeström, S., Västfjäll, D., Barradas, G., & Silva, A. (2008). An experience sampling study of emotional reactions to music: Listener, music, and situation. *Emotion, 8,* 668–683. http://dx.doi.org/10.1037/a0013505

Juslin, P. N., Sakka, L., Barradas, G. T., & Liljeström, S. (2016). No accounting for taste? Idiographic models of aesthetic judgment in music. *Psychology of Aesthetics, Creativity, and the Arts, 10,* 157–170.

Juslin, P. N., & Scherer, K. R. (2005). Vocal expression of affect. In J. A. Harrigan, R. Rosenthal, & K. R. Scherer (Eds.), *The new handbook of methods in nonverbal behavior research* (pp. 65–135). Oxford, United Kingdom: Oxford University Press.

Juslin, P. N., & Sloboda, J. A. (Eds.). (2010). *Handbook of music and emotion: Theory, research, applications*. Oxford, United Kingdom: Oxford University Press.

Juslin, P. N., & Västfjäll, D. (2008). Emotional responses to music: The need to consider underlying mechanisms. *Behavioral and Brain Sciences, 31,* 559–575. http://dx.doi.org/10.1017/S0140525X08005293

Kagema, N. D. (2013). The use of gospel hip-hop music as an avenue of evangelizing the youth in Kenya today: A practical approach. *American International Journal of Contemporary Research, 8,* 161–169.

Kigunda, M. (2007). *Music and health in Kenya: Sound, spirituality, and altered consciousness juxtaposed with emotions*. Saarbrücken, Germany: Verlag Dr. Müller.

Kitayama, S., Mesquita, B., & Karasawa, M. (2006). Cultural affordances and emotional experience: Socially engaging and disengaging emotions in Japan and the United States. *Journal of Personality and Social Psychology, 91,* 890–903. http://dx.doi.org/10.1037/0022-3514.91.5.890

Kleinen, G. (1994). Musikalischer Ausdruck und ästhetische Wertung als interkulturelle Qualität und Differenz [Musical expression and aesthetic evaluation as crosscultural quality and difference]. *Musikpsychologie Jahrbuch de Deutschen Gesellschaft für Musikpsychologie, 11,* 76–111.

Laukka, P., Eerola, T., Thingujam, N. S., Yamasaki, T., & Beller, G. (2013). Universal and culture-specific factors in the recognition and performance of musical affect expressions. *Emotion, 13,* 434–449. http://dx.doi.org/10.1037/a0031388

Liljeström, S., Juslin, P. N., & Västfjäll, D. (2013). Experimental evidence of the roles of music choice, social context, and listener personality in emotional reactions to music. *Psychology of Music, 41,* 579–599. http://dx.doi.org/10.1177/0305735612440615

Lomax, A. (1962). Song structure and social structure. *Ethnology, 1,* 425–451. http://dx.doi.org/10.2307/3772850

MacDonald, R., Kreutz, G., & Mitchell, L. (Eds.). (2012). *Music, health, and well-being*. Oxford, United Kingdom: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199586974.001.0001

McCrae, R. R. (2007). Aesthetic chills as a universal marker of openness to experience. *Motivation and Emotion, 31,* 5–11. http://dx.doi.org/10.1007/s11031-007-9053-1

McCrae, R. R., & Allik, J. (Eds.). (2002). *The five-factor model across cultures*. New York, NY: Kluwer Academic/Plenum Press Publishers. http://dx.doi.org/10.1007/978-1-4615-0763-5

Matsumoto, D., Grissom, R. J., & Dinnel, D. L. (2001). Do between-culture differences really mean that people are different? A look at some measures of cultural effect size. *Journal of Cross-Cultural Psychology, 32,* 478–490.

Merriam, A. P. (1964). *The anthropology of music*. Evanston, IL: Northwestern University Press.

Mesquita, B. (2001). Emotions in collectivist and individualist contexts. *Journal of Personality and Social Psychology, 80,* 68–74. http://dx.doi.org/10.1037/0022-3514.80.1.68

Mesquita, B., Frijda, N. H., & Scherer, K. R. (1997). Culture and emotion. In P. Dasen & T. S. Saraswathi (Eds.), *Handbook of cross-cultural psychology: Theory and method* (Vol. 2, pp. 255–297). Boston, MA: Allyn & Bacon.

Mesquita, B., Vissers, N., & De Leersnyder, J. (2015). Culture and emotion. In J. Wright & J. Berry (Eds.), *International encyclopedia of social and behavioral sciences* (2nd ed., pp. 542–549). Oxford, United Kingdom: Elsevier. http://dx.doi.org/10.1016/B978-0-08-097086-8.24012-9

Meyer, L. B. (1956). *Emotion and meaning in music*. Chicago, IL: Chicago University Press.

North, A. C., Hargreaves, D. J., & Hargreaves, J. J. (2004). Uses of music in everyday life. *Music Perception, 22,* 41–77. http://dx.doi.org/10.1525/mp.2004.22.1.41

North, A. C., Hargreaves, D. J., & O'Neill, S. A. (2000). The importance of music to adolescents. *British Journal of Educational Psychology, 70,* 255–272. http://dx.doi.org/10.1348/000709900158083

Oatley, K., Keltner, D., & Jenkins, J. M. (2006). *Understanding emotions* (2nd ed.). Oxford, United Kingdom: Blackwell.

Osborne, J. W. (1981). The mapping of thoughts, emotions, sensations, and images as responses to music. *Journal of Mental Imagery, 5,* 133–136.

Oyserman, D., & Lee, S. W. S. (2008). Does culture influence what and how we think? Effects of priming individualism and collectivism. *Psychological Bulletin, 134,* 311–342. http://dx.doi.org/10.1037/0033-2909.134.2.311

Panksepp, J. (1998). *Affective neuroscience: The foundations of human and animal emotions*. New York, NY: Oxford University Press.

Patel, A. D., & Demorest, S. (2013). Comparative music cognition: Cross-species and cross-cultural studies. In D. Deutsch (Ed.), *The psychology of music* (3rd ed., pp. 647–681). San Diego, CA: Academic Press. http://dx.doi.org/10.1016/B978-0-12-381460-9.00016-X

Pearsall, J., & Hanks, P. (Eds.). (1998). *The new Oxford dictionary of English*. Oxford, UK: Oxford University Press.

Rawlings, D., & Leow, S. H. (2008). Investigating the role of psychotism and sensation seeking in predicting emotional reactions to music. *Psychology of Music, 36,* 269–287. http://dx.doi.org/10.1177/0305735607086042

Reisberg, D., & Heuer, F. (2004). Memory for emotional events. In D. Reisberg & P. Hertel (Eds.), *Memory and emotion* (pp. 3–41). Oxford, United Kingdom: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780195158564.003.0001

Robinson, M. D., & Clore, G. L. (2002). Episodic and semantic knowledge in emotional self-report: Evidence for two judgment processes. *Journal of Personality and Social Psychology, 83,* 198–215. http://dx.doi.org/10.1037/0022-3514.83.1.198

Roe, K. (1985). Swedish youth and music: Listening patterns and motivations. *Communication Research, 12,* 353–362. http://dx.doi.org/10.1177/009365085012003007

Romney, A. K., Moore, C. C., & Rusch, C. D. (1997). Cultural universals: Measuring the semantic structure of emotion terms in English and Japanese. *Proceedings of the National Academy of Sciences United States of America, 94,* 5489–5494. http://dx.doi.org/10.1073/pnas.94.10.5489

Russell, J. A. (1980). A circumplex model of affect. *Journal of Personality and Social Psychology, 39,* 1161–1178. http://dx.doi.org/10.1037/h0077714

Rusting, C. L., & Larsen, R. J. (1997). Extraversion, neuroticism, and susceptibility to positive and negative affect: A test of two theoretical models. *Personality and Individual Differences, 22,* 607–612. http://dx.doi.org/10.1016/S0191-8869(96)00246-2

Saarikallio, S. (2012). Cross-cultural approaches to music and health. In R. MacDonald, G. Kreutz, & L. Mitchell (Eds.), *Music, health, and well-being* (pp. 478–490). Oxford, United Kingdom: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199586974.003.0031

Scherer, K. R. (1997). The role of culture in emotion-antecedent appraisal. *Journal of Personality and Social Psychology, 73,* 902–922. http://dx.doi.org/10.1037/0022-3514.73.5.902

Scherer, K. R. (1999). Appraisal theories. In T. Dalgleish & M. Power (Eds.), *Handbook of cognition and emotion* (pp. 637–663). Chichester, United Kingdom: Wiley.

Scherer, K. R., Wallbott, H. G., Matsumoto, D., & Kudoh, T. (1988). Emotional experience in cultural context: A comparison between Europe, Japan, and the USA. In K. R. Scherer (Ed.), *Facets of emotion: Recent research* (pp. 5–30). Hove, United Kingdom: Psychology Press.

Scherer, K. R., & Zentner, M. R. (2001). Emotional effects of music: Production rules. In P. N. Juslin & J. A. Sloboda (Eds.), *Music and emotion: Theory and research* (pp. 361–392). Oxford, United Kingdom: Oxford University Press.

Schupp, H. T., Cuthbert, B. N., Bradley, M. M., Birbaumer, N., & Lang, P. J. (1997). Probe P3 and blinks: Two measures of affective startle modulation. *Psychophysiology, 34,* 1–6. http://dx.doi.org/10.1111/j.1469-8986.1997.tb02409.x

Seeger, A. (1987). *Why Suya sing: A musical anthropology of an Amazonian people*. Cambridge, United Kingdom: Cambridge University Press.

Shaw, C., & Chase, M. (Eds.). (1989). *The imagined past: History and nostalgia*. Manchester, United Kingdom: Manchester University Press.

Singelis, M. T., & Sharkey, F. W. (1995). Culture, self-construal, and embarrassability. *Journal of Cross-Cultural Psychology, 26,* 622–644. http://dx.doi.org/10.1177/002202219502600607

Sloboda, J. A. (1992). Empirical studies of emotional response to music. In M. Riess-Jones & S. Holleran (Eds.), *Cognitive bases of musical communication* (pp. 33–46). Washington, DC: American Psychological Association. http://dx.doi.org/10.1037/10104-003

Sloboda, J. A., & Juslin, P. N. (2001). Psychological perspectives on music and emotion. In P. N. Juslin & J. A. Sloboda (Eds.), *Music and emotion: Theory and research* (pp. 71–104). Oxford, United Kingdom: Oxford University Press.

Sloboda, J. A., & O'Neill, S. A. (2001). Emotions in everyday listening to music. In P. N. Juslin & J. A. Sloboda (Eds.), *Music and emotion: Theory and research* (pp. 415–430). Oxford, United Kingdom: Oxford University Press.

Steinbeis, N., Koelsch, S., & Sloboda, J. A. (2006). The role of harmonic expectancy violations in musical emotions: Evidence from subjective, physiological, and neural responses. *Journal of Cognitive Neuroscience, 18,* 1380–1393. http://dx.doi.org/10.1162/jocn.2006.18.8.1380

Stone, R. (1982). *Let the inside be sweet: The interpretation of music event among the Kpelle of Liberia*. Bloomington, IN: Indiana University Press.

Striedter, G. F. (2005). *Principles of brain evolution*. Sunderland, MA: Sinauer Associates.

Thompson, W. F., & Balkwill, L.-L. (2010). Cross-cultural similarities and differences. In P. N. Juslin & J. A. Sloboda (Eds.), *Handbook of music and emotion: Theory, research, applications* (pp. 755–788). Oxford, United Kingdom: Oxford University Press.

Tourangeau, R., Conrad, F. G., & Couper, M. P. (2013). *The science of web surveys*. Oxford, United Kingdom: Oxford University Press. http://dx.doi.org/10.1093/acprof:oso/9780199747047.001.0001

Trapnell, P. D., & Campbell, J. D. (1999). Private self-consciousness and the five-factor model of personality: Distinguishing rumination from reflection. *Journal of Personality and Social Psychology, 76,* 284–304. http://dx.doi.org/10.1037/0022-3514.76.2.284

Triandis, H. C. (1994). *Culture and social behavior*. New York, NY: McGraw-Hill.

Tsai, J. L., Knutson, B., & Fung, H. H. (2006). Cultural variation in affect valuation. *Journal of Personality and Social Psychology, 90,* 288–307. http://dx.doi.org/10.1037/0022-3514.90.2.288

Turino, T. (1993). *Moving away from silence: Music of the Peruvian altiplano and the experience of urban migration*. Chicago, IL: University of Chicago Press. http://dx.doi.org/10.7208/chicago/9780226816951.001.0001

Vassar, M. (2007). A note on the score reliability for the Satisfaction With Life Scale: An RG study. *Social Indicators Research, 86,* 47–57. http://dx.doi.org/10.1007/s11205-007-9113-7

Visser, P. S., Krosnick, J. A., & Lavrakas, P. J. (2000). Survey research. In H. T. Reis & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (pp. 223–252). New York, NY: Cambridge University Press.

Viswanathan, T., & Cormack, J. (1998). Melodic improvisation in Karnatak music: The manifestation of raga. In B. Nettl & M. Russell (Eds.), *In the course of performance: Studies in the world of musical improvisation* (pp. 219–233). Chicago, IL: University of Chicago Press.

Vuoskoski, J., Thompson, W. F., McIlwain, D., & Eerola, T. (2012). Who enjoys listening to sad music and why? *Music Perception, 29,* 311–317. http://dx.doi.org/10.1525/mp.2012.29.3.311

Wells, A., & Hakanen, E. A. (1991). The emotional uses of popular music by adolescents. *The Journalism Quarterly, 68,* 445–454. http://dx.doi.org/10.1177/107769909106800315

Wildschut, T., Sedikides, C., Arndt, J., & Routledge, C. (2006). Nostalgia: Content, triggers, functions. *Journal of Personality and Social Psychology, 91,* 975–993. http://dx.doi.org/10.1037/0022-3514.91.5.975

Zentner, M. R., & Eerola, T. (2010). Self-report measures and models. In P. N. Juslin & J. A. Sloboda (Eds.), *Handbook of music and emotion: Theory, research, applications* (pp. 187–221). Oxford, United Kingdom: Oxford University Press.

Zentner, M., Grandjean, D., & Scherer, K. R. (2008). Emotions evoked by the sound of music: Characterization, classification, and measurement. *Emotion, 8,* 494–521. http://dx.doi.org/10.1037/1528-3542.8.4.494

Appendix

Web Survey Items

1. How old are you? _____

2. What is your gender?

☐ Female

☐ Male

3. Please state your nationality: _____

4. What is your current occupation? _____
(e.g. work, studies)

5. Have you had any education?

☐ No

☐ Yes, primary school

☐ Yes, secondary school

☐ Yes, higher education (college/university)

6. Do you play any musical instrument?

☐ No

☐ I used to play an instrument, but I don't anymore

☐ Yes - Please state instrument(s) and how long you have played: _____

7. Have you received any kind of music education, which lasted more than a year?

☐ Yes

☐ No

(*Appendix continues*)

8. Below you will find a long list of genres of music. Please check the genres that you prefer (i.e., the kind of music you like the most). If you do not know what a particular music genre term means, please just leave it unchecked.

☐ Alternative
☐ American/British pop
☐ Australian indigenous music
☐ Benga
☐ Blues
☐ Bossa nova
☐ Classical music
☐ Club/house/discotheque
☐ Country
☐ Dansband
☐ Electronica
☐ Evergreen
☐ Fado
☐ Folk music
☐ Forró
☐ Funk
☐ Heavy metal
☐ Jazz
☐ Movie soundtracks
☐ Música Ligeira Portuguesa
☐ Música pimba
☐ Música Popular Brasileira
☐ Musical
☐ Opera
☐ Pop på svenska
☐ Punk
☐ Rap/hip-hop
☐ Reggae
☐ Religious/gospel
☐ Rock
☐ Rock'n'roll
☐ Samba
☐ Schlager
☐ Soft/relaxing/chill music
☐ Soukous
☐ Soul/R'n'B
☐ Spelmansmusik
☐ Taarab
☐ Zouk

(*Appendix continues*)

9. Why do you generally listen to music? Please try to estimate the frequency of occurrence of the following reasons for listening to music in your life.

I listen to music to relax

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to pass the time

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to reflect on life

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to get energized

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to obtain some company

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to influence my emotions

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music because I'm interested in the music

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to create a certain atmosphere

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to appreciate the beauty of music

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to create a sense of social belonging

Rarely 1 2 3 4 5 6 7 *Often*

(*Appendix continues*)

I listen to music because I like to listen to the lyrics

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to enhance my health and well-being

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to affirm who I am as a person

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music to evoke personal memories

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music because others (e.g. friends) choose to play music

Rarely 1 2 3 4 5 6 7 *Often*

I listen to music simply because music occurs in the background and cannot be turned off

Rarely 1 2 3 4 5 6 7 *Often*

10. Try to estimate roughly how many hours per week (on average) you listen to music:

0	5	10	15	20	25	30	35	40	More than 40
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

11. In your estimation, approximately how much of the total time you listen to music, do you experience emotions to the music?

0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%
☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

(*Appendix continues*)

12. Try to the best of your ability to estimate how often you experience each of the following emotions in response to music. (Take into account all situations in your life where music occurs.)

		Rarely						Often
1.	Happiness - elation	1	2	3	4	5	6	7
2.	Sadness - melancholy	1	2	3	4	5	6	7
3.	Surprise - astonishment	1	2	3	4	5	6	7
4.	Calm - contentment	1	2	3	4	5	6	7
5.	Interest - expectancy	1	2	3	4	5	6	7
6.	Nostalgia - longing	1	2	3	4	5	6	7
7.	Anxiety - nervousness	1	2	3	4	5	6	7
8.	Pride - confidence	1	2	3	4	5	6	7
9.	Anger - irritation	1	2	3	4	5	6	7
10.	Love - tenderness	1	2	3	4	5	6	7
11.	Disgust - contempt	1	2	3	4	5	6	7
12.	Admiration - awe	1	2	3	4	5	6	7
13.	Boredom-indifference	1	2	3	4	5	6	7
14.	Pleasure-enjoyment	1	2	3	4	5	6	7
15.	Spirituality-transcendence	1	2	3	4	5	6	7

13. Do you ever deliberately choose to listen to pieces of music that make you feel sad?

Rarely 1 2 3 4 5 6 7 *Often*

If you can, please explain why: _____

_____

(*Appendix continues*)

14. Try your best to estimate how often your emotional reactions to music are due to each of the following causes:

The music features an event (e.g. a very loud sound) that 'startles' me

Rarely 1 2 3 4 5 6 7 *Often*

The music features a strong and captivating rhythm

Rarely 1 2 3 4 5 6 7 *Often*

The music evokes memories of events from my life

Rarely 1 2 3 4 5 6 7 *Often*

The music arouses an emotion through associations

Rarely 1 2 3 4 5 6 7 *Often*

The music evokes images that affect my emotions

Rarely 1 2 3 4 5 6 7 *Often*

I am touched by the emotional expression of the music

Rarely 1 2 3 4 5 6 7 *Often*

The music features unexpected or inventive changes

Rarely 1 2 3 4 5 6 7 *Often*

The music is aesthetically valuable (e.g. beautiful, original)

Rarely 1 2 3 4 5 6 7 *Often*

The music has practical consequences for my goals or plans in life

Rarely 1 2 3 4 5 6 7 *Often*

The music features lyrics that influence my emotions

Rarely 1 2 3 4 5 6 7 *Often*

(*Appendix continues*)

15. We want to learn more about emotional responses to music that occur in everyday life. *Try to remember a recent occasion when you experienced an emotion while listening to music.* (It may be a positive emotion or a negative emotion; a strong emotion or a weak emotion.) Please do not read any further until you can recall a particular event!

How long ago did the music experience take place?

- ☐ Within the last 24 hours
- ☐ Within the last week
- ☐ Within the last month
- ☐ Longer than 1 month ago

Which of the following categories best corresponds to the emotion you experienced?

- ☐ Happiness-elation
- ☐ Sadness-melancholy
- ☐ Surprise-astonishment
- ☐ Calm-contentment
- ☐ Interest-expectancy
- ☐ Nostalgia-longing
- ☐ Anxiety-nervousness
- ☐ Pride-confidence
- ☐ Anger-irritation
- ☐ Love-tenderness
- ☐ Disgust-contempt
- ☐ Admiration-awe
- ☐ Boredom-indifference
- ☐ Pleasure-enjoyment
- ☐ Spirituality-transcendence
- ☐ Other emotion

How intense was the emotion that you experienced?

Not at all intense	1	2	3	4	5	6	7	*Very intense*

(*Appendix continues*)

Where were you when you experienced the emotion?

- ☐ At home
- ☐ In a vehicle
- ☐ At work/school
- ☐ Outdoors
- ☐ In a shop
- ☐ At a café
- ☐ At another person's house
- ☐ At a concert or theatre
- ☐ In a place of worship
- ☐ At a party
- ☐ In a gym
- ☐ At a pub/discotheque/club
- ☐ At a restaurant
- ☐ Other location

What was your main activity?

- ☐ Work/study
- ☐ Travel
- ☐ Social interaction
- ☐ House work
- ☐ Watching TV/movie
- ☐ Listening to music
- ☐ Physical activity
- ☐ Shopping
- ☐ Having a meal
- ☐ Relaxation
- ☐ Partying
- ☐ Computer games
- ☐ Concert/theatre attendance
- ☐ Other activity

(*Appendix continues*)

Who was present in the situation?

- ☐ Nobody, I was alone
- ☐ A partner or friend
- ☐ My family
- ☐ An acquaintance or colleague
- ☐ Several friends or acquaintances
- ☐ One or more strangers
- ☐ A large crowd

What music did you listen to? (Try to be as specific as possible!)

_____

Where did the music come from?

- ☐ Television
- ☐ Radio
- ☐ Stereo equipment
- ☐ Mobile phone/MP3 player/I-pod
- ☐ Computer
- ☐ Live music
- ☐ Public loudspeaker

Had you heard the music before?

- ☐ Yes
- ☐ No

Did you choose the music?

- ☐ Yes
- ☐ No

(*Appendix continues*)

How much did you like the music?

Not at all 1 2 3 4 5 6 7 *A lot*

What do you think caused the emotion you felt?

☐ The music featured an event that startled me
☐ The music had a strong and captivating rhythm
☐ The music evoked a memory of an event from my life → proceed to memory item
☐ The music aroused emotions through associations
☐ The music evoked images that affected my emotions
☐ I was touched by the emotional expression of the music
☐ The music featured unexpected or inventive changes
☐ The music was aesthetically valuable (e.g. beautiful, original)
☐ The music had practical consequences for my goals in life
☐ The music featured lyrics that affected my emotions
☐ I don't know
☐ Other cause, namely: _____

Memory item (nested)

The overall tone of the memory was:

☐ Negative
☐ Mixed/Blended
☐ Positive

Why did you listen to the music?

☐ To relax
☐ To pass the time
☐ To reflect on life
☐ To get energized

(*Appendix continues*)

☐ To obtain some company

☐ To influence my emotions

☐ I was interested in the music

☐ To create a certain atmosphere

☐ To appreciate the beauty of music

☐ To create a sense of social belonging

☐ I wanted to listen to the lyrics of the music

☐ To enhance my health and well-being

☐ To affirm who I am as a person

☐ To evoke personal memories

☐ Others (e.g. friends) chose to play music

☐ Music simply occurred in the background and could not be turned off

☐ Other reason, namely: _____

16. Below are five statements with which you may agree or disagree. Using the 1-7 scale below, indicate your agreement with each item. Please be open and honest in your responding.

1 = Strongly disagree
2 = Disagree
3 = Slightly disagree
4 = Neither agree or disagree
5 = Slightly agree
6 = Agree
7 = Strongly agree

_____ In most ways my life is close to my ideal.

_____ The conditions of my life are excellent.

_____ I am satisfied with life.

_____ So far I have gotten the important things I want in life.

_____ If I could live my life over, I would change almost nothing.

(*Appendix continues*)

17. Here are a number of personality traits that may or may not apply to you. Please mark a number next to each statement to indicate the extent to which you agree or disagree with that statement.

	Disagree Strongly			*Neither agree or disagree*		*Agree*	*strongly*
I see myself as:	1	2	3	4	5	6	7
Extraverted, enthusiastic	☐	☐	☐	☐	☐	☐	☐
Critical, quarrelsome	☐	☐	☐	☐	☐	☐	☐
Dependable, self-disciplined	☐	☐	☐	☐	☐	☐	☐
Anxious, easily upset	☐	☐	☐	☐	☐	☐	☐
Open to new experiences, complex	☐	☐	☐	☐	☐	☐	☐
Reserved, quiet	☐	☐	☐	☐	☐	☐	☐
Sympathetic, warm	☐	☐	☐	☐	☐	☐	☐
Disorganized, careless	☐	☐	☐	☐	☐	☐	☐
Calm, emotionally stable	☐	☐	☐	☐	☐	☐	☐
Conventional, uncreative	☐	☐	☐	☐	☐	☐	☐

18. Please indicate the extent to which you agree or disagree with the following statements:

My attention is often focused on aspects of myself I wish I'd stop thinking about.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

Sometimes it is hard for me to shut off thoughts about myself.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I tend to 'ruminate' or dwell on things that happen to me for a really long time afterward.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I don't waste time rethinking things that are over and done with.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I never ruminate or dwell on myself for very long.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

(*Appendix continues*)

It is easy for me to put unwanted thoughts out of my mind.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

Philosophical or abstract thinking doesn't appeal to me that much.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I'm not really a meditative type of person.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I love exploring my 'inner' self.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I don't really care for introspective or self-reflective thinking.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I love to meditate on the nature and meaning of things.

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

I often love to look at my life in philosophical ways

Strongly disagree 1 2 3 4 5 6 7 *Strongly agree*

---

19. To what extent do you experience nostalgia in life in general?

Rarely 1 2 3 4 5 6 7 *Often*

20. Is nostalgia evoked by *music* important in your life?

Not at all 1 2 3 4 5 6 7 *A lot*

(*Appendix continues*)

21. Do you believe that listening to music enhances to your well-being?

Not at all 1 2 3 4 5 6 7 *A lot*

22. Do you have any further thoughts or comments on this investigation?

_____

_____

_____

Thank you for your participation!

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