The Connection between Communication, Music, and the Individual: A Business Communication Application

By

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Abstract

Music has long functioned as a tool for connecting buyers and sellers in the marketplace. Whereas companies will often use music (i.e., a song, playlist, or genre) to sell a product, music's complexity often makes it difficult to understand which part of a song produces a desired effect (e.g., happiness). To better understand how music affects a buyer, this study recognizes music as a distinct type of communicative message that may be deconstructed, and its parts examined. Two parts of music—musical key and tempo—are analyzed independently according to a receiver's (or listener's) perception of an identified emotion. The results clarify how a receiver associates a specific type of emotion with a musical key, note, and tempo. Three findings are advanced identifying emotion/key, emotion/note, and emotion/tempo response patterns. Business communication applications are then offered so business owners may make more informed decisions regarding music to advertise or sell their product.

Keywords*:* behavior, communication, emotion, SADFISH, musical key, music

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Among the ways that humans communicate with each other, few rival music's ability to connect a sender and receiver. As Taylor and Friedman (2015) and Weisgerber et al. (2013) note, music has the ability to quickly transmit emotion to a receiver as well as regulate a receiver's mood. Interestingly, these effects are not

limited by cultural and linguistic differences. Whereas many businesses use music to market their brand, some business owners fail to recognize music's importance to the buying process (North, Sheridan, & Areni, 2015; Susino, 2019). For instance, new small business owners–often preoccupied by the duties of running a business–can neglect to take advantage of music's power in persuading a buyer to consider and purchase goods or services. Thankfully, existing social science research has–to a certain extent–already considered how musical preference, scale, genre, pitch, pleasantness, and tempo play a role in the customer experience. This research seeks to advance this line of inquiry.

Introduction

Given music's many parts (i.e., key, pitch, and tempo), music holds exciting potential to enhance the seller/buyer point-of-sale experience both atmospherically and monetarily. To understand what science has established regarding music's impact on a listener or receiver, the following sections summarize these majors from literature concerning how music impacts a listener. The topics include music and listener (a) physical response, (b) music and cognition, and (c) music and emotion. The first section looks at music's ability to physiologically impact a customer.

Music and Physical Response

Multiple studies confirm that music can produce a physiological effect in a buyer. One powerful attribute of music is that it can produce or *vehiculate* (i.e., convey or communicate) emotion in an audience (Carpentier & Potter, 2007). Given this fact, Krumhansl (1997), Rickard (2004), and Burns et al. (1999) found that different songs tend to impact a listener's *skin conductance response* (SCR) or change the moisture level on the skin of a listener when a stimulus is introduced (e.g., a fast-tempo song is commonly associated with SCR activation). For example, Sachs et al. (2016) notes that SCR takes place when one experiences a physical reaction to a song (e.g., chills). In short, a listener with high connectivity within the auditory areas of the brain experiences a wider range of emotions as well as more intense emotions that can manifest themselves on the skin.

Carpentier and Potter (2007) further found that certain songs produce a high *skin conductance level* (SCL, i.e., the average level of conductivity created by sweat

production during a set time interval) that is commonly referred to as goosebumps or chills in a receiver. Given this research, businesses who rely on emotional responses in the advertising and buying process (e.g., buying baby maternal or parenting products) benefit when they give attention to music's power in producing a physical reaction (e.g., goosebumps). For those businesses whose sales rely less on emotions during the buying process (e.g., medical products or construction firms), emotion is less of a priority, especially as it applies to skin response. In addition to music influencing a buyer's physical response during the buying process, research has also confirmed that music routinely impacts a listener's *thinking* in distinct ways.

Music and Cognition

Over the past few decades, numerous researchers have analyzed music's impact on the receiver in a communicative exchange and focused on listener cognition. For instance, Juslin et al. (2022) and Sakka and Saarikallio (2020) found that music is processed differently by a listener based on one's personal and behavioral characteristics. Likewise, Vempala and Russo (2013) found that one's innate understanding of music changes how a listener perceives certain parts of a song (e.g., a key or tempo). In related research, Sachs et al. (2016) found that higher white matter connectivity in the brain is associated with understanding someone else's perspective. Further, Kim and Zauberman (2018) determined that the cognitive processing of tempo influence one's decision-making abilities as well as one's perception of time (Eroglu et al., 2005; Oakes, 2003).

More recently, Mehr et al. (2019) determined that while musical interpretation varies by community, listener reaction to music is in many ways universal. Mehr et al. contends that different musical components influence different cognitive faculties of the listener. These components include language (e.g., lyrics and message), motor control (e.g., dancing and movement), auditory analysis (e.g., signatures of tonality), and aesthetics (e.g., the melodic and rhythmic balance between chaos and monotony). In sum, research has confirmed much about music's effect on cognition. In addition to research noting music as producing a skin response and affecting one's thinking, multiple studies have separately looked at how music influences listener emotion. That research follows.

Music and Emotion

Vempala and Russo (2013) found that music tends to impact a receiver *cognitively* and *emotionally*. According to their research, some listeners *pay attention* to cognitive cues, such as listening to a happy song, understanding it is happy, but not feeling a song's emotional intention; Vempala and Russo termed these individuals *cognitivists*. Conversely, some listeners feel the emotional elements of a song, such as listening to a happy song and feeling happy because of a song; Vempala and Russo termed them *emotivists*. Vempala and Russo contend it remains unclear whether music is more expressive (i.e., emotivist) or more elicited (i.e., cognitivist). In short, their study reveals that there are different ways that one makes sense of music and different ways the brain responds to music.

In general, a range of articles reveal what has been determined about how music impacts a listener emotionally. For instance, Sachs et al. (2016) found that music has less of an impact on individuals with lower white connectivity. (Those with low white connectivity routinely have difficulty expressing emotion in communication situations.) In this vein, Mehr et al. (2019) determined that certain acoustic features (e.g., accent, tempo, pitch range) tend to influence the reception of emotional messages in songs by a listener. Fernández-Sotos et al. (2016) advance that music key and tempo have a great deal of influence on a listener's affective reaction. Liu et al. (2018) confirm that some tempos tend to elicit a particular emotion. For instance, a tempo perceived as being faster is more likely to elicit a positive emotion whereas a slower tempo is likely to elicit a negative emotion. When applied to speech, fast dialogue is judged as being less pleasant and slow dialogue as more pleasant (Kellaris & Rice, 1993; Eroglu et al., 2005; Stewart & Koh, 2017; Franco & Angelova, 2016; Droit-Volet et al., 2013; Fernández-Sotos et al., 2016). Moreover, Milliman (1986) notes that a faster tempo results in shorter dining times for restaurants, whereas a slower tempo increases time spent in a grocery store.

In related research, Juslin et al., (2022) and Sakka and Saarikallio (2020) determined that behavior and personality factors influence how intensely one experiences emotions when listening to music. A high level of emotional empathy gives one the ability to experience music more deeply like how one utilizes emotional empathy to sympathize with someone else.

Interestingly, Fritz et al. (2009) found that major emotions conveyed in Western music (e.g., happy, sad, and scared/fearful) can be universally recognized. This trend was found to be like the universal recognition of human emotional facial expressions (i.e., surprise, anger, disgust, fear, interest, sadness, and happiness or SADFISH) as well as other nonverbal forms of expression (Eckman & Friesman, 1969). Those businesses who serve clientele of different languages (e.g., a restaurant) need to keep this in mind if they aim to enhance their sales to both groups. Whereas much is known regarding the physical, cognitive, and emotional impact of music, there are opportunities for further inquiry in this area.

Purpose of this Study

Based on this literature, two insights become apparent. *Insight one*: Research establishes music as a unique type of communicative message warranting further inquiry. Of music's many roles, the most impactful is its ability to communicate a message and a feeling to the receiver. Music's ability to regulate mood (Taylor & Friedman, 2015) comes as no surprise as research indicates that music can transmit emotion quickly. Drawing on Weisgerber et al. (2013), music's ability to communicate emotion transcends cultural and linguistic barriers. In short, music can strengthen a relationship between patron and business or weaken it by poor application or general negligence.

Insight two: While past literature offers much concerning how music impacts a listener, there is still much more to learn. For example, research has only partially established how music's distinct parts impact cognition and emotion (Liu et al., 2018). Understanding how certain variables independently impact a listener would go far in equipping scientists and business owners with information that helps to forge a positive relationship with a customer and builds clientele over time.

This study strives to advance what is known regarding how musical key and tempo impact one's physical response, thought, and emotional processes. To this end, the following research questions are posed for inquiry:

RQ1: What musical key and tempo does a listener associate with sadness?

RQ2: What musical key and tempo does a listener associate with happiness?

Materials and Methods

Sample

The sample to this study consisted of 380 participants, ranging from ages 18-54. All total, 353 participants were ≤ 25 years of age and 27 participants were ≥ 26 years of age. The mean age of participants was 20.7 years old. The median was 20 years old. And the mode was 18 years old. Participants were interviewed on a large university campus in the southeast. One hundred sixty-six participants were white or Caucasian, 105 were Black or African American, 54 were Hispanic or Latino, 30 were Asian or Pacific Islander, 14 were multiracial or biracial, and 11 identified as *other*.

Process of Measurement

To extend current research regarding how a listener processes music, this study chose to capture what a participant innately recognized as an emotional state by having them produce the note and tempo they associate with a given emotion. To determine what musical key and tempo are often associated with a given emotion (e.g., sadness or happiness), data was obtained three ways.

First, a participant responded to a series of questions regarding music and how it affects them. The survey included: (1) When listening to a sad song, do you feel that the song is sad or notice the song is sad? (2) Do you get goosebumps (or other skin response) when listening to music? (3) Do you have musical training? (4) How important are lyrics and messages to you on a scale of 0 to 10? (5) How important is sound and instrumentation to you on a scale of 0 to 10, and (6) How important is rhythm and beat to you on a scale of 0 to 10. Finally, each participant answered a range of demographic questions (e.g., age, ethnicity).

Second, participants were asked to hum a particular note they associated with a given emotion. To limit the emotions addressed in this research, the study focused on three emotional states: sad, neutral, and happy. The computer application *Pitch - Tuner & Metronome* was used to capture the precise note hummed by a participant. (*Pitch - Tuner & Metronome* is a software produced by Coda labs, Inc. Based on 1,457 reviews on the [Apple] App Store, the average rating for this app was 4.6 out of 5 stars. The accuracy of the app was verified by comparing it to a

tuning fork). Once a participant hummed a note, a researcher documented the key and octave of the hummed note.

Third, each participant was next asked to tap his or her finger in a consistent beat of equal intervals associated with each emotional state: sadness, neutral, or happiness. Again, *Pitch - Tuner & Metronome* was used to capture the specific tempo tapped by the participant. At that point, a researcher recorded the tempo of the tapping.

Procedure

Data was obtained in three steps. Participants were approached on a university campus and asked to participate in a study on the topic of music. Upon agreement, the study began with demographic items seeking info on age, gender, and ethnicity, this was followed by the remainder of the study involving music. Verbal consent was obtained prior to asking any questions.

To ensure consistency across measures, a researcher used the following script for the humming portion of the study: "Think of emotion as a spectrum with sad being on one end, happy on the other, and neutral in the middle." Participants next were told: "Now, think of yourself as being in a *sad* state of mind, void of any feeling, and hum a note you think is a sad note." The participant had to sustain the humming of a note for ≥ 2 seconds to ensure an accurate reading. Key, note (or pitch), and octave from the hummed note were then transcribed in the same way that was done for the emotion of Neutral.

Participants then told: "Now, keep thinking of that same *sad* emotion, and tap your finger to a tempo you think is sad." After a participant tapped his or her finger to an equal interval rhythm, he or she felt was most indicative of a sad emotion, a response was recorded in beats per minute (BPM) using a rhythm software once a consistent (+1/-1) BPM was held for ≥ 3 beats.

Additionally, participants were told*:* "Now, think of yourself as being in a *neutral* emotion, void of any feeling, and hum a note you think is a neutral state." Identical to what was done for the emotion of sadness, a researcher recorded the tempo.

Participants were then told: "Now, keep thinking of that same *neutral* state, and tap your finger to a tempo you think is neutral." After a participant tapped his or her finger to an equal interval rhythm, he or she felt was most indicative of a neutral emotion, a response was recorded in beats per minute (BPM) using a rhythm software once a consistent (+1/-1) BPM was held for ≥ 3 beats.

Finally, the process of extracting a hummed note and tapped tempo were replicated for a third and final time, only this time for the emotion of *happiness*. Identical to what was done for the emotion of sadness and neutrality, the tempo was recorded. Participants were told: "Now, keep thinking of that same *happy* emotion, and tap your finger to a tempo you think is happiness." After a participant tapped his or her finger to an equal interval rhythm, he or she felt was most indicative of happiness, a response was recorded in beats per minute (BPM) using a rhythm software once a consistent (+1/-1) BPM was held for ≥ 3 beats. Finally, upon completion of these questions and the participants' offering a note and tempo corresponding to a given emotion, participants were thanked for their time and willingness to participate.

Results

Based on the research questions advanced for this study (RQ1: What musical key and tempo does a listener associate with *sadness*? and RQ2: What musical key and tempo does a listener associate with *happiness*?), the following results were obtained based on participant performance (i.e., each participant humming a note corresponding to an emotion and then offering a tempo that also reflected the same emotion). The results of this data collection are offered in two sections: First, the formative survey results, and second, the listener musical response as they correspond when prompted by a researcher.

Formative Results

In answering the first question posed to participants in this study, "When listening to a sad song, do you feel the song is sad or notice that the song is sad?" 285 participants reported they felt sad when hearing a sad song, and 95 participants reported that they noticed that a song was sad. In terms of breakdown of response by gender, 78% of males reported that they felt a song was sad compared to 72% of females.

Regarding the second question posed to participants in this study: "Do you get goosebumps when listening to music?" 87% reported they experienced goosebumps. When considering gender on this item, 88% of females experienced goosebumps while 86% of males reported the same response.

As to question three offered to participants: "Do you have any musical experience?" 277 of the 380 participants reported that they had musical experience.

Regarding question four posed to participants: "How important are lyrics to you on a scale of 0 to 10?" females produced a mean response of 7.24 on a 10-point scale while males produced a 7.04 on the same scale.

Concerning question five, which states, "How important is sound and instrumentation to you on a scale of 0 to 10?" females generated a mean of 8.59 and males averaged 8.63.

Last, in terms of question six: "How important is rhythm and beat to you on a scale of 0 to 10?" females produced a mean of 8.25 and males produced a mean of 8.30.

To compare how *cognivists* versus *emotivists* process music, survey questions one and two were combined to differentiate those who felt a song or noticed the emotion of a song. Of the 380 participants, 95 reported *noticing* emotional qualities of a song rather than feeling, indicating cognitivist behavior. Of these 95 *cognitivists*, 47 were males and 48 were females.

Conversely, of the 380 participants, 285 reported *feeling* emotional qualities of a song rather than feeling, indicating an *emotivist* behavior. Of the *emotivists*, 118 were female and 167 were male.

When rating the importance of music overall on a 0-10 scale, *cognitivists* averaged 8.8 and *emotivists* averaged 7.2. Results from this section allow an understanding for how certain preferred musical qualities, such as lyrics or sound, may be associated with an individual's ability to comprehend music.

Emotion and Key Distribution

The next section of the study involved participants humming notes that reflected a distinct emotion (i.e., sadness, neutrality, or happiness). To understand how a key is associated with an emotional state among participants, a frequency table was generated so each key could be recorded reflective of a given emotion.

As Table 1 indicates, certain notes were hummed more often than others when listeners were asked to communicate a certain emotion. As shown, the key of Ab (which is also G#)--bolded in the table–was hummed a total of 50 times as a note associated with being *sad*. Put another way, Ab (or G#) was the note hummed most often for *sadness*. Conversely, the key of C–also bolded in the table–was hummed a total of 41 times as reflective of *happiness* as an emotion. Refer to Table 1 for a detailed breakdown of which notes reflect the emotional states measured in this study.

As shown in the table, for sadness, 47% of participants hummed notes within the same 4-key succession of G, Ab / G#, A, or Bb / A#. For a neutral state, 55% of participants hummed notes within the same 4-key succession of either A, Bb / A#, B, or C. In contrast, for happiness, a much more even distribution was observed in a 4-key succession with 38% of participants humming C, C# / Db, D, or D# / Eb.

Emotion, Note Distribution, and Octave

Based on the performance data of participants described in the last section (i.e., the humming of a note that reflected a given emotion [e.g., sadness or happiness]), data was separately analyzed according to its note or pitch (i.e., how low or high a note is) and the octave (i.e., the distance from one note of a particular letter name to the next occurrence of the same letter-named note on a keyboard; Gerhold, 2018) where it appeared. A frequency table was developed to catalog the note or pitch of a hum (refer to Column 1 or Note/Pitch) and the octave in which it appears (refer to Column 5 or Octave). Those notes hummed most often are shaded darker in Table 2 to what octave was hummed most often by participants. See Table 2 for a complete reporting of the hummed notes based on note or pitch frequency and its corresponding octave.

In terms of note selection and octave, Table 2 reveals a visible pattern for note/pitch and octave frequency. Based on this data, participant responses were grouped by upper and lower octaves, indicating a shared understanding of a note or pitch regardless of octave. As evident, participants in both upper and lower octave groups communicated similar key movements across the three emotions.
As Table 2 indicates, the notes hummed most for *sadness* appear in Key A and Bb (A#), Octave 2. These two keys (and their associated octave) were each hummed 28 times to communicate a *sad* emotional state. Separately, the noted hummed most often for a *neutral* emotional state was B. It was hummed 32 times also in Octave 2. Moreover, the note hummed most often for *happiness* was C was hummed 24 times in Octave 4.

Additionally, Table 2 offers a 4-note pattern like Table 1 based on the frequency of hummed notes. Specifically, these notes were hummed most often for sadness: G, Ab (G#), A, and Bb / (A#). Further, these notes were hummed for neutrality: A, Bb / (A#), B, and C. And these notes were hummed for happiness: C# / (Db), D, D# / (Eb), and E.

Separately, when notes in more than one Octave were aggregated, a different pattern of emotional states was evident. Specifically, when participants were asked to hum sadness, most often they hummed the same notes in Octaves 2 and 3. These were the notes they hummed (with the associated frequency counts): G 39 times, Ab / (G#) 47 times, A 47 times, and Bb / (A#) 40 times. When participants were asked to hum a neutral emotional state, those notes clustered at the top end of Octave 2 and the top end of Octave 3 and the bottom end of Octave 4. Those notes entailed (with each frequency count): A 54 times, Bb / (A#) 41 times, B 50 times, and C 49 times. Lastly, when participants were asked to hum a note that reflects happiness, those notes appeared in Octave 3 and 4 and included these notes (with their given frequency): C# / Db 39 times, D 32 times, D# / (Eb) 38 times, and E 30 times.

Emotion and Tempo

In addition to determining the key, notes, and octaves linked with a given emotion according to participants, this study next captured the beats per minute (BPM) associated with three emotional states: sadness, neutrality, and happiness. In

general, when asked to tap a beat to a given emotion, the mean BPM was 98 beats, the median BPM was 89 beats, and the mode BPM was 80 beats.

When addressing individual emotions, for *sadness*, the mean BPM was 62 beats, the median BPM was 59 beats, and the mode BPM was 60 beats. For a *neutral* state, the mean BPM tempo was 93 beats, the median BPM was 92 beats, and the mode BPM was 80 beats. Finally, for *happiness*, the mean BPM was 139 beats, the median BPM was 130 beats, and the mode BPM was also 130 beats. See Table 3 for a detailed breakdown of which tempos reflect the three emotional states measured in this study. Those tempos tapped most often are shaded (green) in the table.

When viewing tempo responses for each emotion, Table 3 exhibited a pattern much like Table 2 when it comes to musical patterns one associated with an emotion. As evident in Table 3, responses were typically spaced 30 BPM apart with much tighter groupings. The tempo of 51-60 BPM–shaded in the table–was tapped a total of 98 times as a tempo associated with being *sad*. In other words, 51-60 BPM was the tempo tapped most often for *sadness*. In contrast, the tempo of 111-130 BPM–also shaded in the table–was tapped a total of 96 times as reflective of *happiness*. Lastly, when analyzed separately, *cognitivists* displayed a slightly higher average tempo than *emotivists*.

Discussion

This study originally posed two research questions to understand what emotions a listener associated with a given musical key and tempo. The following two research questions were advanced for inquiry: RQ1: What musical key and tempo does a listener associate with *sadness*? and RQ2: What musical key and tempo does a listener associate with *happiness*? Based on the data obtained and analyzed for this study, three findings were generated.

Finding 1. Humans associate specific musical keys with certain emotions.

Unlike some past studies where music and emotion were measured using a self-report survey, this study required that participants share what they believed to be musical keys reflecting a certain emotion: in particular, notes that convey sadness, neutrality, or happiness. From these results, humans in Western society innately agree on specific keys indicative of sadness. In this research, a 4-key grouping–G,

Ab / G#, A, or Bb / A#–was consistently performed by participants for sadness. Specifically, sadness was communicated 47% of the time by these keys, regardless of octave.

Next, when prompted to share a note characteristic of happiness, participants offered responses that also clustered as a 4-key grouping; yet in contrast, the keys that were produced were in the middle of the musical scale: C, C# / Db, D, or D# / Eb. These notes were communicated 38% of the time. Given the difference in note rate recognition of the two emotions (47% to 38%), it is not clear why sadness was agreed upon more often by participants than happiness. This difference may be a product of the uniqueness of each emotion. For example, is sadness experienced in a more limited way by humans, and thus is associated with a specific set of notes more often? This study did not explore that question.

Additionally, it is unclear why the emotional category of neutrality–also generating a 4-note pattern (A, Bb / A#, B, or C)—received more responses than sadness or happiness. The 4-note pattern for neutrality was performed 58% of the time. Again, further inquiries are well informed to take this result into consideration. Notwithstanding, participants agreed that specific keys did communicate sadness and happiness. Likely (Fritz et al., 2009), those key/emotion combinations may be universally recognized.

Finding 2. Humans associate a given pitch class with certain emotions.

Much like the 4 key-note pattern addressed in the last finding, participant performance of pitch (i.e., how low, or high a note is) revealed that sadness or happiness also clustered in certain areas on the musical scale. (See Table 2). When asked to hum a note reflecting sadness, participants produced these notes most often–Ab (G#), A, Bb (A#), and B–yet they did so in a lower octave on the musical scale, in this case most often in Octave 2, and to some extent in Octave 3. Additionally, as Table 2 indicates, when asked to perform a note or pitch by emotion that reflected sadness, participants produced notes much less often in a high octave, and none in Octave 5.

In contrast, the range of notes for the emotion happiness were typically performed in a higher scale, producing a cluster of notes or pitches associated with happiness

in Octave 3 and 4. At close examination (See Table 2), happiness commonly shows up in Octave 3: in most cases, in the middle of the musical scale with D# (Eb), E, F, F# (Gb) and G. There was a slight variation of this pattern in that notes C and D# (Eb) in Octave 4 also spiked high for happiness. Again, why this occurred is unclear.

What is clear is that from this data, humans innately agree on a pitch class (i.e., notes of the same key, but different octaves) that we associated with sadness, neutrality, and happiness. Quite possibly, these notes' function represent emotions understood by most everyone, irrespective of ethnicity or nationality. Potentially, this may be the most important insight gained from this study. In brief, musical keys and notes may/pitches may offer a common language of understanding for all peoples in terms of expressing emotions.

Finding 3. Humans gravitate to a tempo pattern for certain emotions.

This study confirms that there is an innate shared understanding of the emotional message behind not only keys and octaves, but also tempos. In this case, this research confirmed that humans routinely associated sadness with slower tempos and a lower mode (i.e., in this, a scale). Conversely, happiness was associated with faster tempos and a higher mode (i.e., again, a scale). As this research indicates, whereas humans associate specific keys and notes with a certain emotion—some moderate probability—humans associate tempo with certain emotions with higher probability (e.g., sadness and emotion). Simpler, tempo is one of the most consistent ways humans communicate emotion to another person. This fits with Fernández-Sotos et al. (2016) in that they found that tempos offer an ability to elicit a particular emotion in their listeners.

Interestingly, a few qualifications need to be considered when interpreting this finding. For one, age had little influence on tempo choice; moreover, gender also had little influence on tempo choice. And key innate characteristics (e.g., being an emotivist, or experiencing goosebumps) influence emotional reproduction of tempo. In sum, when changes in tempo occur more so, they produce arousal over emotion. Innate characteristics play the largest role in influencing key and tempo interpretation, despite being out of the participant's control. Based on these findings, the following business communication applications merit consideration.

Business Communication Applications

Based on these findings regarding the connection between emotion, musical key, note, and tempo, three applications are here advanced for business owners who might capitalize on music's power on sales. These insights are as follows.

Application 1. Business owners can enhance their products sell ability by including music in advertising and sales.

Given the findings of this study, the most obvious way to help a business increase its sales is helping business owners understand the connection between SCR and music. Using music that knowingly produces an SCR response in clients will, without question, increase the purchasing experience. Identifying which songs elicit such a response requires that business owners have some understanding of clientele. Practically, a restauranteur can certainly enhance the attractiveness of his or her restaurant by consciously choosing musical pitch and tempos that convey the emotion reflective of a restaurant's product (i.e., think of the Chick-fila or Burger King ["You Rule!"] advertising jingles). Those simplistic songs, without question, play a role in drawing customers to their restaurants.

Application 2. Business owners benefit when they understand if their clientele is emotional or non-emotional.

For businesses that use music to promote an emotional response from their brand, there is a significant importance to understand how music works (North, Sheridan, & Areni, 2015; Susino, 2019). Without question, this study confirms that music conveys emotion (Carpentier & Potter, 2007); however, it is important to know the kinds of emotion it conveys. Through music and SCR research (Krumhansl, 1997; Rickard, 2004; Burns et al. 1999), selecting songs that are known to produce such a response would be particularly advantageous. Understanding the preferences of one's clientele can aid in accurately selecting such music. In addition to producing a pleasurable experience, music is instrumental in influencing their behavior while in the place of business (e.g., the rate at which one eats in a restaurant (Eroglu et al., 2005; Oakes, 2003).

Application 3. Business owners benefit when they use music that aligns their identity with their products and customer expectations.

As mentioned by Kim and Zauberman (2018), it is vital that a business owner considers the role of tempo as it contributes to the overall decision-making process. In this vein, it is important that owners consider the musical preferences of their clientele. For example, those businesses that cater to morning versus evening crowds may need to give special attention to music at separate times of the day. Moreover, those businesses who produce products with musical elements, (e.g., microwaves or coffee makers that beep), should consider which notes or pitches are viewed as most desirable by the buyers of these products. By doing so, an owner can enhance the product experience thanks to octave equivalency (the perceived similarity of pitches in different octaves as variations of the same note) at play (Burns, E. M. 1999; Patel, 2003). In sum, key, pitch, and tempo are highly influenced by an individual's ability to like a product or services and the music that accompanies each experience.

Limitations and Future Research

Despite the strengths of this research, this study is not without its limitations. For one, this inquiry might have benefited by modifying those questions asked initially for participants. For example, while participants were asked if they had musical training, this question was not followed up by how much training each person had. Consequently, it remains unclear how extensive musical training might play a role in how one associated emotional with a musical key or tempo. Moreover, this research might also benefit by determining if ethnicity or cultural background impacts one's perception of musical preferences. As noted here, research has already confirmed that, without question, music tends to vary by region. What is not known is how one's familiarity with local music balances with musical's universal appeal across ethnicity, national borders, and cultures. Lastly, given that an app--*Pitch - Tuner & Metronome*—was used to capture a precise note hummed by a participant, a separate reliability check might have involved also playing a scale for participants and asking them to stop on the note that reflects happiness or sadness.

Moving forward, future research should move beyond examining individual notes and their connection to a given emotion to analyzing strings of notes or

melodies. To do so, participants might be asked to hum their own tune in a unique melody. That method could then be examined based on note combinations or tempo consistency or variation. Analysis of this type would go far supporting or adjusting the results obtained here. Moreover, future studies might consider whether frequency or hertz is of any relevance in this line of research.

Factors such as musical tendencies, knowledge, and preferences all clearly serve a role in the participant's interaction with music. These findings highlight how important the listener's role is in interpreting what is communicated in a note, song, or music catalogue. Findings confirm how emotion influences a participant's internalization of key and tempo. The answering of these questions in the end aims to equip the business owner with information to improve the customer's experience and enhance their bottom line: sales (North, Sheridan, & Areni, 2015).

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