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An Emotional Timing: Influencing Patient's Perceived Emotions Using Audio Sensory Cues Through Musical Tempo

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Abstract

The purpose of this master thesis is to discover whether the manipulation of musical tempo in an audio track will have an effect on a patient's perceived emotions in a dental practice environment and the role of gender. We investigate this question by conducting an online survey-based experiment based on three musical tempos being slow (60 bpm), medium (100 bpm), and fast (120 bpm) from the same audio track and based on five perceived emotions being tense, excited, calm, relaxed, and nervous. First, we found that slow tempo audio positively enhanced the patient's emotions (relaxed, calm, excited) while fast tempo audio negatively enhanced the patient's emotions (tense, nervous). Second, we found that the main effect for gender is statistically significant and males and female respondents have a difference in the level of feeling calm, nervous, excited, tense, or relaxed based on all three audio tempos tested. Finally, the purpose of our thesis was to research if there is a way for a patient's experience to be improved through the implementation of auditory cues. This improvement in perceived emotions, we believe, will greatly improve a customer's experience when visiting a dental practice.

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1. Introduction

Dental anxiety is a widely recognized phenomenon. In fact, studies have proven that dental treatment can be associated with negative emotions such as fear, anxiety, and stress (Singh & Kapoor, 2019). Patients can experience different levels of intensity of fear such as dental fear, dental anxiety, and finally dental phobia (Aminabadi et al., 2017) Thus, what makes people so afraid of going to the dentist? How to overcome fear of doctors and more specifically dentists?

Many different reasons could explain why people get nervous and stressed before undergoing dental treatment or simply before visiting the dentist for a regular check-up. In fact, it could be due to the fear of anesthesia, or due to a bad previous experience (Singh & Kapoor., 2019). Similarly, one study has shown that over 75% of adults experience dental anxiety or fear because of the pain the dental procedures could cause (Statistic Stats., 2020). Moreover 36% said they were not visiting the dentist because they could not afford it, and 24% said they would not go to the dentist unless they feel discomfort and that treatment is needed (Statistica, 2020). However, it is important to visit the dentist for a regular check-up even though a patient does not feel any pain or discomfort. Not having regular check-ups could cause major consequences on the patient's oral health which could lead to emergency treatments in the future. Lastly, other reasons could be because patients fear a future diagnosis, or because of the medical environment and overall atmosphere (Welly et al., 2012). Indeed, the environment such as the smell or the sound play an important role when it comes to the customer's experience in a dental office and can often increase the fear of the patients.

However, according to previous research, using multisensory marketing could be a way to reduce the perception of fear, pain, and discomfort associated with dentist appointments and thus improve the patient's overall experience. In fact, according to Krishna (2012), multisensory marketing is "an application of the understanding of sensation and perception to the field of marketing, to consumer perception, cognition, emotion, learning, preference choice or evaluation" (Krishna, 2012 p. 334). In addition, she defines it as "marketing that engages the consumers' senses and affects their perception, judgment, and behavior" (Krishna., 2012). In fact, the five most common

senses are haptics, olfaction, audition, taste, and vision. Moreover, the main difference between sensory marketing and traditional marketing is that sensory marketing stimulates several senses simultaneously while traditional marketing usually involves only one sense.

As a recent marketing method, multisensory marketing is being researched upon to view its efficiency and opportunity for growth. According to Peck and Childers (2008), one third of the sensory studies focusing on multisensory marketing have been published. This shows how promising this marketing field is and therefore the opportunity for more research in the future. Sensory marketing is progressively being used by more marketers and other professionals as it can subconsciously and consciously trigger and engage different consumer's senses simultaneously. Moreover, it can trigger consumer's perceptions and judgments such as the quality or the elegance of an attribute (Krishna., 2012). In order to trigger these senses and change consumer's behavior/perceptions, brands use stimuli elements such as smell, taste, shape, audio and/or color of an attribute. Managing these stimuli and being aware of all of these elements is therefore crucial for managers as it can have a significant impact on a company's revenues, but it can also connect people closer to the brand by creating a tighter and more personal bond between the customer and the company (Moreira et al., 2017). Furthermore, it can make the brand stand out from other competitive brands as well as improving the overall customer's experience (Moreira et al., 2017).

Hence, using multisensory marketing at a dental office has many benefits. First, by stimulating both subconsciously and consciously the patient's senses it can influence the patient's feelings, emotions, and behavior which will improve the patient's overall experience. Second, it also helps to build the dentist's brand awareness and brand identity and thus set the dentist apart from the competition. Third, it can establish favorable impressions and create a professional bond between the patient and the dentist.

Although multisensory marketing has been studied intensely in a variety of industries, not much research on multisensory marketing has been investigated in the health care context. A dental office is a place where most people are still afraid to go and where they perceive negative emotions such as anxiousness, fear, or tension. Therefore, it

would be interesting and useful to see how multisensorial marketing could improve the patient experience and reduce the fear and anxiety of having to go see a dentist.

To make the patient's experience better, investigating visual marketing such as the choices of colors, the office windows, the smell, the layouts as well as the touch are essential to research as it could improve the patient's overall experience. However, in our study, our focus is going to be only on one sense which is the auditory. Auditory is a large dimension and is widely used in many different industries. For instance, auditory communication can be a slogan, a jingle, a voice, signature sounds, a language, an ambient music, or music in general (Biswas., 2016). These sounds often have a meaning and a distinct identity (Biswas., 2016)**.** This research is going to investigate the impact of auditory marketing and more specifically music tempo on the patient's perceived emotions as well as the effect of gender. In fact, music has previously been studied in other contexts and proven to have an effect on the receiver's emotions. This research wishes to ride on these positive effects to improve a medical appointment's emotional reception. However, the design of in-store music encompasses a broad range of musical dimensions. For instance, tempo, volume, node, harmony, melody, tone are different dimensions of music. This study will investigate only one of the musical dimensions which is the music tempo being slow, medium, and fast as well as the effect of gender. We believe that studying the music tempo at a dental office could offer dental practice marketing insights into making their services more pleasing to customers by stimulating their senses. Music tempo could reduce the perception of fear associated with medical appointments. Therefore, we formulate our research question as follows:

"Does musical tempo affect a patient's perceived emotions at a dental office and how it depends on the gender of the patient?"

Our paper is organized as follows. We will first review prior academic literature on music in general, perceived emotions, musical genres, gender, and present our hypotheses. Then, we will go through the research methodology design, the description of the data, and the analysis of the results. Finally, we will include a discussion about the key findings and the managerial implications, as well as a part regarding the limitations and future research.

2. Literature Review

Sensory marketing is a very promising and growing field and as a result, more and more studies have been conducted in various situations and contexts. According to Knoeferle (2020), multisensory has received significant interest due to the technological advances also called "sensory revolution" and the increased understanding of research of how senses can be applied to marketing or other situations (Knoeferle, 2020). Examples of sensory marketing include the atmosphere in a restaurant such as the sound, smell, touch, etc., and how it influences the customers' experience (Sliburytė & Le Ny., 2017).

Sensory marketing can influence a consumer's experience, behavior, satisfaction and emotions (Krishna, 2012). Hearing is one of the senses alongside taste, smell, touch, sight and others. According to Lowe et al (2019), listening is the human sense that enables the detection of threat due to the fact that sounds have 360 radius, and that sound can be heard even when it comes from behind you (Lowe at al., 2019). Each day, people are filled with auditory knowledge as they are subjected to an extremely large number of sounds. In fact, in addition to stimulating the rational part of the brain, sound is also able to stimulate the emotional part of the brain (Uddin, 2011; Antoniadou, et al., 2020). Thus, sound is an effective means for engaging with people's emotions and for enhancing their mood by instilling feelings (Uddin., 2011; Antoniadou, et al., 2020). Similarly, studies reported that auditory stimuli such as jingle, slogan, voice, music that are associated with a brand have a greater emotional impact on a person compared to tactile or visual stimuli (Rv et al., 2015). Furthermore, music is a valuable and powerful tool for eliciting emotions as it causes the endorphins to be released, resulting in pleasurable feelings (Kliuchko et al., 2015). Moreover, sound is often linked to threat. In a dental office for instance, the high-pitched sounds of the tools increase the fear and pain of a patient. Thus, sound frequency as well as sound pitch are essential to investigate in marketing situations as they can reduce or increase fear and have an impact on the overall customer's experience and emotions (Lowe et al., 2019).

Hence, when choosing an auditory sound strategy, marketers or in this case dentists should carefully consider all of the aspects as the consequences can be colossal. In fact, implementing a successful strategy could impact positively the brand's reputation and credibility as well as generating positive feelings and emotions which would result in setting the competition apart (Upadhyaya et al., 2017). In the next section, background music will be discussed.

2.1. Background Music

2.1.1. Definition of Music

According to Dictionary.com, music "is an art of sound in time that expresses ideas and emotions in significant forms through the elements of rhythm, melody, harmony, and color" ("Definition of music | Dictionary.com", 2021). Music is made of different elements such as rhythm (tempo, volume), dynamics, melody, harmony, tone, color, texture, thus, different musical genres exist. For instance, jazz, instrumental, electronic, country, classical, etc., are different types of music genres with different musical characteristics (Pachet et al., 2000).

2.1.2. Background Music vs. no Background Music

Several researchers have found that in general it was more beneficial for stores to have in-store music than no music (Michel et al., 2017). This was especially true in waiting situations. In fact, when it comes to the customer's emotions the study reported that when in-store music was played, the customers were more aroused compared to its absence (Hui et al., 1997; Michel et al., 2017**)**. This is mostly because customers are often likely to be negative in these waiting situations, thus in-store music can have a more significant effect on the customer's emotions than no music. As a result, customers' perception of time is significantly shorter when music is played. This is due to the fact that in-store music is distracting customers which then leads to an underestimated perceived wait duration (Hui et al, 1997; Michel et al., 2017**)**. However, other studies have found different results on customer's emotions due to a different situation, for instance during the shopping process **(**Andersson et al., 2012**;** Michel et al., 2017). Thus, these different customer's emotional states may vary depending on the situation and context.

Furthermore, other studies have shown that music can also positively affects the consumers' emotions, behavior and brand attitude as it can give a meaning to them and be seen as a persuasive tool (Morris & Boone., 1998). For instance, Park and Young (1986) demonstrated that the use of in-store music had an impact on customer's brand attitude (such as mood) and as a result, an impact on the ad persuasion. Moreover, music can be very stimulating for consumers, especially for those with low involvement in advertising as it can positively persuade them about a product or a service (Park and Young., 1986). In addition, other researchers have proven that in-store music can positively influence the customer's feelings/emotions and purchase intention (Morin et al., 2007). Similarly, other studies have found that the presence of in-store music has an effect on customer's behavior as customers could on average stay 15 minutes longer in the store when music was played (Sullivan, 2002; Michel et al., 2017).

Another effect of in-store music on customer's behavior is the sales volume. In fact, a significant number of studies showed that in-store music could enhance individual sales volumes by nearly 45% compared to the absence of music (Michel et al., 2017). One reason for that was because the music was making the customers feel in a better mood. Additionally, Knoeferle, Paus and Vossen (2017) investigated the effect of background in-store music on social density and on customer's spending. They found that in-store music can alleviate the negative effects that in-store crowding can have on consumer's spending (Knoeferle et al., 2017). Moreover, their research suggested that when a store faces high-density conditions, fast music had a positive effect on spending as customers were to spend more money. Thus, according to this study, social density in stores can be moderated by fast background music which will then impact the overall experience of the customer and then also impact positively on consumer's spending (Knoeferle et al., 2017).

However, interestingly, other studies have found no correlation or mixed effects between in-store music and sales volume (North et al., 2015; Michel et al., 2017). Thus, this might depend on the type of music played, the physical and/or preferential musical dimensions, and other factors such as gender, age.

2.1.3 Background Music Healing Effect and Anxiety Reducing

Furthermore, several studies have shown that music could reduce anxiety and have a healing effect. Music has been suggested to affect the levels of stress in the listener, whether to increase or lower it based on the tempo of the audio (Thoma et al., 2013). In fact, music has widely been used in medical fields as a stimulant for brain activity. Bradt, Potvin, *et al* (2015) studied more closely the actual effects of music on pain tolerance and psychological condition on cancer patients. The study compared the effect of music therapy and music creation on the patients. Music Medicine (MM) does not require therapeutic knowledge or guidance and patients only listen to pre-recorded music. Music Therapy (MT) does require therapeutic guidance or partner. In this scenario, patients listen to a multitude of musical sources such as live music, pre-recordings, playing music and music composition (Bradt et al., 2015). The test was divided in such a way that patients went through four sessions of testing. First two they created the music and in the following two, the patients are made to listen to pre-recordings. Following the experiment, the outcomes indicated that both types of sessions were equally effective in treating a patient's pain levels and emotions. (Bradt et al., 2015). Moreover, Bradt et al. believe that music has pain-relieving effects on a neurological level, and helps patients direct their attention away from the pain, and instead focus on the tunes. They believe that music activates imagery that allows patients to explore previous memories or activate their imagination, once more moving their attention from any pain or discomfort they may feel.

Another example where the use of music is useful and efficicient is when it comes to medical use. In fact, the use of ambient music in waiting rooms can positively affect a patient's emotions and reduce anxiety. Fencko and Looks (2014) investigated the ambient effect of both music and scent in a waiting room of a plastic surgeon. Waiting in a waiting room before a health appointment can be stressful for some individuals and therefore, can increase the level of anxiety and negatively impact the patient's emotions. The findings of the study were that both the use of lavender scent and instrumental music reduced a patient's anxiety and had a positive effect on the patient (Fencko and Looks., 2014).

2.1.4 Background Music in Advertising and Retail Stores

Background music has been widely used in advertising. In fact, it has been shown that music can not only enhance the consumer's emotions but also the consumer's arousal, behavior, and pleasure when an advertisement is displayed (Morris & Boone., 1998; Garlin and Owen., 2006). Similarly, a more recent study supports the aforementioned findings. In fact, Roschk et al (2017) reported that music could have positive effects on behavioral intentions, satisfaction, and pleasure (Roschk et al., 2017). Additionally, the use of background music in retail stores has been widely researched. In fact, another study found that, in retail stores for instance, music can shape an individual's emotional experience (Juslin, 2019). Moreover, music is often perceived as a "peripheral cue" or as an "atmospheric influence" (Morris & Boone., 1998; Rodgers et al., 2021). As a result, music is able to positively stimulate and shape the customer's emotions such as pleasure and arousal as well as the customer's behavior (Morris & Boone., 1998; Oakes et al., 2013; Roschk et al., 2017).

Therefore, in-store music is a crucial aspect in advertising, retail stores, and medical offices. In fact, it can have a significant impact on the customer's response compared to the absence of music. For instance, the use of in-store music can have an effect on the customer's affective states such as emotion, perception of time, evaluation/satisfaction. Moreover, it can impact the behavior of a customer's response such as the time spent in-store, purchase intention, sales volume, and patronage behavior (Michel et al., 2017). Even though most of the studies aforementioned showed positive outcomes when using in-store music, some studies have also shown negative effects or no effects of the existence of in-store music (Michel et al., 2017). The reason why is because some moderators such as the age, gender, time of the day, or service setting can influence the customer's response. Additionally, the design of the in-store music (physical dimension, preferential dimension, and genre) can influence the customer's response and emotions (Michel et al., 2017). In other words, the tempo, the volume, the music fit, the familiarity, the musical genres, etc. Next, in the following section, the two dimensions of emotions being valence and arousal will be presented.

2.2. Two Dimensions of Emotions: Valence and Arousal

Previous stuides have reported that one of the main reasons for listening to music has been stated to be emotional responses (Schäfer et al., 2013; Shifriss et al., 2015; Reybrouck and Eerola, 2017; Ribeiro et al., 2019). Moreover, numerous studies have shown that music can stimulate legitimate basic emotions such as happiness, fear, and sadness (Västfjäll, 2002; Fritz et al., 2009; Egermann et al., 2015; Ribeiro et al., 2019). Additionally, several theories regarding emotions have found that emotions can be divided into two categories: valence and arousal. Bestelmeyer et al (2017) reported that "arousal" (or intensity) is the level of autonomic activation that an event creates, and ranges from calm (or low) to excited (or high). Valence, on the other hand, is the level of pleasantness that an event generates and is defined along a continuum from negative to positive" (Bestelmeyer et al., p.1351, 2017). Thus, in other words, valence refers to the degree to which an emotion is positive or negative (pleasant vs unpleasant) while arousal corresponds to its intensity and degree of excitement, to the strength of the emotional state that is associated with it (high vs low) (Citron et al., 2014). Furthermore, James Russell (1980) developed the "Circumplex Model of Affect" which is a competing theory of emotions. This model is a 2D valence-arousal emotional space (see figure 1 below). It displays on the x-axis valence (pleasant/unpleasant which refers to positive/negative valence) and on the y-axis arousal (activation/deactivation which refers to high/low arousal). Examples of emotions with positive valence are "excited", "happy", "contented", "relaxed", and "calm" while examples of emotions with negative valence are "tense", "stressed", "nervous", "sad", and "depressed". Similarly, high emotional levels of arousal (activation) are "upset", "excited", "happy", "tense", and "alert". On the other hand, low emotional levels of arousal (deactivation) are "depressed", "calm", "bored", "sad", and "serene". (Russel, 1980; Mora et al., 2011; Yang et al., 2012). Moreover, the affective circumplex model is made of four quadrants. Each of these quadrants represent a combination of the two dimensions: valence and arousal. For instance, the upper left quadrant represents High Arousal Negative Valence (tense, nervous) and the upper right quadrant represents High Arousal Positive Valence (happy, excited). Next, the bottom left quadrant represents Low Arousal and Negative Valence (sad, bored) and the bottom right quadrant represents Low Arousal Positive Valence (relaxed, calm). This model has been widely

examined, challenged, and revised throughout the years. Using this model at a dental office would be useful as it would allow the dentist to know the patient's perceived emotions and to classify and divide these emotions based on the two emotions categories which are valence (pleasant vs unpleasant) and the arousal when playing music at different tempo.

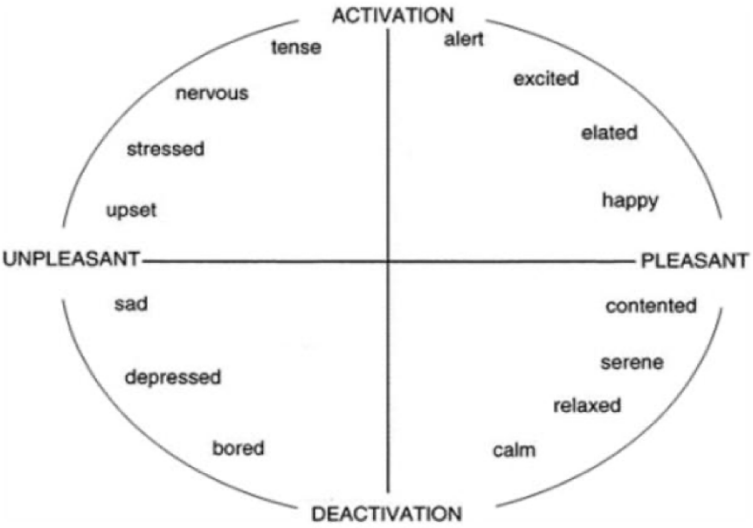

Figure 1. Mora et al. The affective circumplex depicts each emotion along continuous dimensions of arousal (*y*-axis) and valence (*x*-axis)

In summary, numerous studies have reported the importance of using background music in settings such as advertisements, retail stores, medical offices, etc., compared to the absence of music. Moreover, as previously mentioned, background can influence the customer's emotions, satisfaction, behavior, arousal, and valence. However, factors such as age, gender, music physical dimensions, music genres, music tempo, music volume, music familiarity, etc., can affect the customer's emotions. Thus, in the next section, the physical dimension of in-store music and more specifically the music tempo is going to be presented.

2.3. Music Tempo

The design of in-store music can have different dimensions. For instance, it can have a physical dimension (tempo, volume, node), a preferential dimension

(linking/familiarity, fit, popularity), and a musical genre dimension (jazz, instrumental, classic, etc) (Michel et al., 2017). The tempo which is being studied here belongs to the physical dimension of the design in-store music and is a quantifiable variable. Other physical dimensions of in-store music can be the volume (such as the loudness of a music measured in dB) or the musical node (minor or major) (Michel et al, 2017). Karageorghis et al (2012) defined musical tempo as speed of music as measured in beats per minute: "bpm" (Karageorghis et al, 2012). A fast music tempo usually indicates a music with a tempo > 120 bpm (Nuzzo et al, 2019; Terry et al, 2020). On the opposite, a medium music tempo usually indicates a music with a tempo < 120 bpm (Terry et al., 2020). Finally, slow tempo music typically refers to music with a tempo < 100 bpm (Nuzzo et al., 2019). However, other studies have shown to be more precise concerning the bpm. In fact, researchers reported slow tempo to have an average of 72 bpm or less, and fast tempo to have an average of 94 bpm or more (Miliman, 1982, 1986; Michel et al., 2017). Previous studies have found that fast tempo music is often perceived as happier compared to slow tempo music which is often associated with sadness and melancholy (Antoniadou, et al., 2020).

Prior studies have examined the effect of the music such as the tempo and the rhythm as well as the impact of specific musical genres music on consumer's emotions. For instance, an old study from Milliman (1982) examined the use of background music to affect behavior in supermarkets. He found that in a store, the tempo of the music and its variations can impact consumer's shopping behaviors. Moreover, he suggested that background music was not only designed to make customers stay longer in a store and purchase more but also to improve the brand, the store image and the employee's health (Milliman, 1982). The findings of his research were that the store atmosphere can impact by a large amount the time spent in a store, the pace of the in-store traffic flow of customers, and thus, the total amount of sales revenues.

Even years after what Milliman (1982) discovered regarding the music tempo, the majority of managers still believe that today in-store music affects the customer's response and emotions as discussed in the previous section. In fact, other studies have shown that music could reduce anxiety and have a healing effect. Music has been suggested to affect the levels of stress in the listener, whether to increase or lower it based on the tempo of the audio (Thoma et al., 2013). However, the effects of music

may vary depending on the service settings, the musical genres, the fit, the liking, the tempo, the volume, etc. In fact, using the same type of in-store music with the same musical characteristics (such as tempo and volume) for all kinds of stores could hurt the stores and negatively impact customers' responses. In this study, our main focus will be towards the physical dimension of in-store music and more specifically towards music tempo. Thus, it is important to study the music tempo in the different service settings and the customer's responses to music tempo.

Michel et al (2017) conducted research on the effects of in-store music in service settings and studied whether in-store music was helping or harming the store, and how stores would benefit from the music. However, even though in-store music has usually a positive effect, having in-store music does not always lead to positive or negative impact (Michel et al, 2017). In fact, the design of the music (slow vs fast tempo) may be the main reason why.

Generally, studies have shown a positive effect on customer's emotions when a fast music tempo is played. Soh et al (2015) investigated six different service settings: supermarkets, retail, restaurants, bars, cafeterias and banks. They found that having the same type of in-store music for all the service settings was not beneficial. In fact, it should be tailored to each specific store in order to have beneficial effects. For instance, fast music tempo typically positively impacts customer's emotions (pleasure and arousal) in a supermarket, retail, and restaurant settings even though the effect can be moderated by gender or age (Soh et al, 2015; Michel et al, 2017). However, when thinking about the customer's response and more specifically the customer's behavior, fast tempo in-store music and loud music usually have a negative effect on customer's time spent in the supermarket and retail settings as customers spend less time in the store because of the faster traffic pace. Thus, fast tempo music in supermarket and retail settings leads to a negative impact on sales volumes (Knoferle et al, 2012; Soh et al, 2015; Michel et al, 2017). The same thing goes for the restaurant setting as studies have shown that customers were spending less time in the restaurant when fast and loud music was played and were also leaving earlier which then leads to negative impact on sales volumes (Michel et al, 2017). Hence, when the customer's purpose is to relax and

have hedonic purposes, playing fast tempo music is not ideal and can have a backfire effect.

Moreover, when talking about musical volume, loud in-store music usually enhances customer's emotions in retail stores, and thus positively impacts customer satisfaction and evaluation. This is especially true for retail stores (Morrison et al, 2011; Michel et al, 2017) However, regarding bars and restaurants, loud music typically had a negative impact on customer's satisfaction/evaluation as it felt more disturbing for the customers and thus made it difficult to have conversations and socialize with others (North et al, 2000; Michel et al, 2017).

Regarding the bank setting, like/familiar in-store music has a positive impact on the perception of time. This is because customers perceive the waiting time shorter when preferred or liked music is played as the music distracts the customer's attention (Hui et al, 1997; Michel et al, 2017). However, moderators such as gender and age can affect a subject's experience.

Next, in a more medical setting, Van Der Zwaag, Westerink and Broek (2011) conducted a study about the "emotional and psychophysiological responses to tempo, and percussiveness" on people's emotions. During this study, two aspects were recorded: skin conductance and cardiovascular responses. The results of this study were that fast tempo was increasing tension and arousal while decreasing heart rate variability compared to slow tempo music (Van Der Zwaag et al, 2011). This is because in situations where the level of stress is high, the heart rate variability will most likely remain constant under fast tempo music than under slow music tempo (Van Der Zwaag et al, 2011). Moreover, they found that high-percussive music leads to higher skin conductance level and frequency. Hence, this study showed that emotions can be modulated by tempo and percussiveness which is highly relevant in a dental office.

Similarly, another interesting study from Oakes (2003) studied the background musical tempo variation and the temporal perception. The findings were that when slow tempo music was played, the wait duration was perceived less important and created a feeling of satisfaction and relaxation to the customers compared to fast tempo music. (Oakes,

2003) However, playing slow tempo music for longer waits can have a backfire effect and thus decrease the satisfaction inducement (Oakes, 2003).

In the following section, the different musical genres will be discussed, especially the sedative and stimulative music. This further analysis will allow dentists to have a better knowledge about the music types as well as the musical tempo which will help make their services more pleasing to patients by stimulating their senses, thus getting positive and pleasant emotions.

2.4 Musical Genres

Musical genre refers to a "conventional category that identifies pieces of music as belonging to a shared tradition or set of conventions' (What does music genre mean?, 2021). There are a large number of musical genres with different music characteristics such as tempo, volume, rhythm, melody, harmony, tone, etc. Rock, jazz, popular music, sedative and stimulative music, hip pop, instrumental, classical, electronic, and heavy metal are examples of musical genres along with many other genres. The types of music played in a store or at a medical center can influence the customer's affective states. For instance, studies reported that when classical music was played in a store, males were more likely to evaluate the store less positively compared to females (Grewal et al., 2003). Moreover, bars and banks were perceived as more peaceful, inspirational, and valuable when classical music was played. Hence, consumers were evaluating the stores more positively as they were feeling more comfortable and satisfied with the choice of music (North et al., 2000)**.** Next, other musical genres will be discussed related to music tempo and perceived emotions.

2.4.1 Sedative vs Stimulative Music

Prior studies have found that stimulative music tends to have a faster tempo and rhythm compared to sedative music which usually has a slow music tempo and rhythm **(**Silva et al, 2021). In fact, the bpm in sedative, calming, or relaxing music tends to be < 100 bpm while the bpm for stimulative/exciting/energetic music tends to be > 130 bpm. (Karageorghis et al, 1996; Silva et al, 2021). It has also been shown that stimulative music tends to intensify an individual's energy and contribute to the bodily activation

while sedative music tends to decrease the energy and thus activate relaxation (Karageorghis et al, 1996; Silva et al, 2021).

The type of music played in a situation can affect a subject's experience. In this section, sedative/calming music refers to slow tempo music while stimulative/exciting music refers to fast tempo music. As indicated in Medical News Today (2020), "Music therapy involves using a person's responses and connections to music to encourage positive changes in mood and overall well-being." In fact, Zimny and Weidenfeller (1963) studied the effects of three pieces of music (designated as exciting/stimulative, neutral and calming/sedative) upon galvanic skin response (GSR) and heart rate which are two psychological responses to emotions. In this context exciting/stimulative music referred to fast tempo, neutral music to medium tempo, and calming/sedative music to slow tempo. The authors were able to confirm a relationship between music and emotional response due to the measurement of heart rate and skin response. More precisely, the results showed that stimulative/exciting music had a significantly increasing effect upon GSR thus decreased resistance and increased arousal (anger, anxiety, excitement, etc.). On the other hand, sedative/calming and neutral music did not have a significant effect on the emotional response (Zimny and Weidenfeller., 1963; Rickard, 2004).

Similarly, another research found similar results by investigating the effects of stimulative and sedative music on cognitive and emotional components of anxiety. In fact, one study tested students during an exam with different types of music: no music, sedative music (slow tempo) and stimulative music (fast tempo). The researchers found out that stimulative music had a negative effect on student's performance as it increased both worry and negative emotion. Surprisingly, they also found out that sedative music had no effect on anxiety (Smith and Morris, 1976; Dixon et al., 2014).

However, other researchers such as Farnsworth (1969) found different results. In fact, in his book "The Social Psychology of Music", he studied the subjects' emotions (happy vs. sad) after hearing different types of music. He reported that calming and sedative music were able to reduce individuals' anxiety and negative emotions. Thus,

these findings mean that sedative music is able to make the individuals more relaxed and calmer, which are positive emotions.

Similarly, other researchers examined the use of music in therapeutic situations. They were searching for a way to reduce anxiety in high anxiety subjects by using different types of music tempo. The results showed that even though in general music did not reduce anxiety, strong arguments suggested that sedative music (slow tempo) had a stronger influence on reducing anxiety on individuals with high anxiety compared to stimulative music (fast tempo) (Rohner and Miller, 1980; Dixon et al, 2014).
Interestingly, other studies showed that when stimulative music (fast tempo) was playing; heart rate, respiration, blood pressure, tension, and vigor were increasing compared to when sedative music (slow tempo) was playing. This means that stimulative music has a high arousal emotion with both positive and negative valence (pleasant/unpleasant) (Iwanaga and Moroki, 1999; Rickard, 2004). However, a more recent study found that when stimulating music was played, the skin conductance response was increased but not the heart rate (Hirokawa, 2004; Dixon et al, 2014). Therefore, these results regarding sedative and stimulative music are mixed, especially regarding the stimulative music and its impact on the individual's perceived emotions. Hence, future analysis regarding the use of stimulative and sedative music should be conducted in different settings.

Furthermore, more recent researchers such as Jiang, et al (2013), also studied the effect of sedative and stimulative music on stress reduction but had a different angle as it was based on music preference. The results were quite interesting as they found that after listening to unpreferred music, sedative music (slow tempo) had a stronger effect on reducing the subject’s tension levels and anxiety. In fact, their anxiety and tension’s levels were both lower than unpreferred stimulative music (fast tempo) was played (Jiang, Zhou, et al., 2013). Now, here is where it is interesting. In fact, the results showed that after listening to both preferred sedative and preferred stimulative music, there was no significant difference in the subject's state-anxiety levels and tension. Thus, according to this study, and as the title mentioned it, the “the effect of sedative and stimulative music on stress reduction depend on music preference” (Jiang, Zhou,

et al., 2013). Similarly, Jian and Rickson (2016) suggested that music preference was a mediator in reducing stress. Also, they found that the most important factor of stress reduction was not the familiarity with the music but the degree of liking the music (Jian and Rickson., 2016). Additionally, the results were going in the same direction as Iwanaga & Moroki (1999) found that subjects were more relaxed and shifted their attention towards something else (thus away from stress) when listening to preferred music than unpreferred music.

These findings in general regarding sedative (slow tempo) and stimulative music (fast tempo) and perceived emotions are mixed but quite interesting. Further research in different settings such as the dental office could allow dentists to have a better knowledge about the music tempo and make their services more pleasing to customers by stimulating their senses and get positive emotions. In the next section, music genres such as meditative and tranquilizing music, instrumental music, and live music are going to be discussed.

2.4.2 Meditative/Instrumental/Lyrics/Live Music/Tranquilizing music

Meditative music is another musical genre. Mediative music is considered to have a slow tempo music with a bpm between 60 bpm to 80 bpm and is often the result of a decrease in heart rate and stress and thus an increase in relaxation (Hilz et al, 2014; De Witte et al., 2020). Similarly, instrumental music which means a music without any vocals and played only by one instrument or by a group of instruments has proven to also have a positive effect on stress reduction and emotions. The main reason behind this may be due to the fact that the lyrics or vocals can activate and distract more the individuals' emotions rather than calming them (Good et al., 2000; De Witte et al, 2020). Interestingly, other studies have found different results regarding music with lyrics and have found that vocals could reduce stress by comforting the individuals (Koelsch et al., 2011; De Witte et al., 2020). Furthermore, other studies have shown that live music had a greater effect on stress reduction and thus emotions compared to prerecorded music (Arnon et al., 2006; De Witte et al/, 2020). Finally, in a medical context, before, during and after a medical procedure, the use of tranquilizing music, in other words music with a slow tempo, correlates with lower cortisol which thus

reduces anxiety and stress and impact a subject's emotions (Koelsch et al., 2016; De Witte et al., 2020). Interestingly, the use of relaxing music can affect the perception of time a patient has when visiting a dentist (Antoniadou, et al., 2020). Other types of musical genres will be addressed in the following sections.

2.4.3 Classical/Turkish/Electronic Music

Prior studies have investigated the use of musical genres such as classical music and its impact on customer's affective state and received mixed effects. In fact, one study has shown that there were no significant effects on customer's emotions when classical music or top 40 music was played (Sweeney et al., 2002). On the contrary, another study found playing live classical piano music before an ophthalmic surgery could reduce the blood pressure, heart rate, and respiratory rate of the patient (Camara et al/, 2008). Similarly, the use of classical music often makes the customers spend more money and to buy more expensive products. This is especially true for people with higher educational levels (Hultén, 2017). Moreover, in London, which is a wealthy city, classical music is often broadcasted in the London subway to reduce the individual's stress (Maymand Mahmoudi et al., 2012). In a more medical context, one study reported that when a patient is undergoing a coronary procedure at a dental office, the use of classical music has shown to be effective as an anxiolytic. This latter effect is called the "Mozart effect" which has proven to have a positive impact on behavior, health, and learning (Seaward, 2013). Interestingly, a recent study investigated the effect of music in anxiety reduction and emotions (Parada et al, 2020). Both psychological (anxiety, nervousness) and physiological (heart rate, blood pressure) measurements were considered as they can have an effect on people's emotions. Three different musical genres which were classical (Pachelbel's Canon in D), Turkish (Hüseyin Makam), and electroacoustic (pure electronic) were presented to the participants. The results showed that classical (in this case slow tempo: 68 bpm) increased the feeling of calmness which thus had an impact on the participant's emotions. Next the Turkish music which in this study had a slow tempo of 63 bpm which corresponds to slow tempo music. Previous studies have proven that Turkish music is known to be effective in reducing anxiety and blood pressure in patients with hypertension (Bekiroğlu et al, 2013). Parada et al (2020) found no significant effect of

calmness (in between results) when Turkish was played. Lastly, the use of electroacoustic music or pure electronic music (in this case fast tempo) was decreasing the effect of calmness (Parada et al, 2020). Hence, in most cases music with a slow tempo can reduce stress and thus have an effect on a subject's emotions compared to medium and fast tempo (Jiang et al, 2016; De Witte et al, 2020). These results correspond to the findings of the previous section. Even though moderators such as gender, age, musical preferences as well as other moderators can widely impact the listener's emotions.

When choosing background music, musical tempo, and musical types; marketers, retailers, or even doctors need to be aware that music is an important persuasive tool and therefore they can influence the emotions of the customers. However, if the music and tempo are used incorrectly, it can have a backfire effect. Thus, the fit between the background music and the situation is essential and as Grayston's said "the music must fit the situation in which it is to be used" (Milliman, Grayston 1974, p.38).

2.4.4 Liked/Familiar Music

When listening to liked/familiar in-store music in a retail setting, customers are more likely to be more aroused and thus in this case, music has a positive effect on customer's emotions (Michel et al., 2017; Sweeney and Wyber., 2002). This is mainly due to the fact that customers feel more secure when listening to music they know or like. The same effect goes for bank settings as like/familiar in-store music has a positive impact on the perception of time. This is because the music distracts the customer's attention and thus the customer perceives the waiting time shorter when preferred or liked music is played (Michel et al, 2017; Hui et al., 1997). Additionally, the customer feels more satisfied and is more likely to give a positive evaluation of the environment when liked/familiar music is played. This applies for service settings like bars, restaurants, banks, etc (Michel et al, 2017). Similarly, Petruzzelis et al (2014) found that in a retail setting, popular music has mixed effects on consumer's emotions. In fact, on one hand popular music can negatively impact the customer's level of pleasure due to an overexposure effect (saturated, heard too many times). On the other hand, popular music can positively impact the customer's emotions because of the fact that

customers are more aroused by this type of music and the memories associated with it (Petruzzellis et al., 2014).

2.4.5 Music Tempo and Gender

Multiple studies have proven that music can have an effect on a customer's affective states whether it is positive, non-significant, or negative. One of the reasons why the studies received mixed results about the use of music on consumer's perceived emotions may be due to the design of in-store music as well as the variables included in the studies. In fact, the physical dimension of music (which are quantifiable variables) such as tempo, volume, melody, node, harmony, structure, and many other dimensions can have an effect on the consumer's perceived emotions (Michel et al., 2017). Hence, depending on the dimensions that were included and measured in the studies, the results could differ. In addition, the preferential dimension (which depends on the customer's subjective assessment) such as familiarity, liking, fit, popularity, and music genres can also influence the effect of music on consumer's affective states (Michel et al., 2017). Moreover, other moderating variables about the customers, or the environment such as age, time of the day, service settings, and gender are other variables that can influence the consumer's response. The letter, gender, is an important moderator which can have a solid impact on consumer's emotions and behavior (Michel et al., 2017). In fact, concerning the behavior, Jacob et al (2009) reported that females were more likely to spend more time in a store when romantic music was played compared to males who were not influenced by musical genres. Next, concerning affective states, in their study Andersson et al (2012) found that females and males were affected differently by music and more specifically by music tempo in a retail store. Females tend to prefer no-music or slow-tempo/soft music at lower volumes while males tend to prefer having music and fast-tempo/louder music. (Andersson et al., 2012). Andersson et al (2012) also found that in a supermarket setting, males tend to be more positively impacted by fast music while females tend to be more positively impacted by slow music and more negatively impacted by fast music (Andersson et al, 2012). Similarly, Michel et al (2017) found that when instrumental music was played in a store, females derived more positive emotions from soft music than loud music, thus were more satisfied and evaluated the store greater.

Thus, even though music typically has a positive effect on sales, and consumer behavior/emotion, service setting, gender, and other moderating variables can moderate the effect of music customer's affective state/emotions and behavior both positively and negatively. However, further research in a different context where shopping behavior does not occur naturally could contribute to research. It would be beneficial to see if these findings will be similar in a different context than retail or supermarket settings such as a medical context.

2.5 Hypotheses

Therefore, based on all the literature reviewed aforementioned we can affirm that the background music tempo plays a fundamental role in the customer's perceived emotions. However, the majority of these studies did not investigate the music tempo and perceived emotions in a health setting such as a dental office. Therefore, this new analysis could allow dentists to have a better knowledge about the music tempo and make their services more pleasing to customers by stimulating their senses and giving the patient positive emotions. Hence, in our study, we hypothesize that slow tempo background music will lead to positive perceived emotions such as calm, relaxed, or excited. We believe that playing slow tempo music during a dental procedure will allow patients to place their focus away from the actual dental procedure and make them stop thinking about it. It will allow them to focus unconsciously on the slow tempo music played in the background which will make them calmer and more relaxed. Next, we believe that medium tempo background music will also positively affect the patient's perceived emotions. We expect that patients will not feel as calm and as relaxed as when slow tempo background music is played. However, we believe that having medium tempo music played in the background could still reduce the nervousness and tense feeling of undergoing the dental procedure; therefore, making the patients calmer and more relaxed. Finally, we hypothesize that fast tempo background music will lead to negative perceived emotions such as nervousness and tense. In fact, due to the fast tempo of the music played, the patients could feel more stressed and annoyed. Thus, it could add up to the actual affective state of the patient during the medical procedure

and lead even more to the overall patient's experience as it could be even more stressful than the medical procedure itself. Based on these assumptions, we hypothesize that:

H1a: *Slow tempo audio, relative to medium and fast tempo, will positively enhance the patient's emotions during a medical procedure at a dental office. Positive valence (excited/relaxed/calm)*

H1b: *Fast tempo audio, relative to medium and slow tempo, will negatively enhance the patient's emotions during a medical procedure at a dental office. Negative valence (tense/nervous)*

Secondly, we will test the effect gender as a significant factor in influencing a patient's perceived emotions based on musical tempo. To do so we hypothesize that:

H2a*: Gender as a significant factor to slow tempo music having a positive effect on perceived emotions in a dentist environment.*
H2b*: Gender as a significant factor to fast tempo music having a positive effect on perceived emotions in a dentist environment.*

3. Research Methodology Design

To ensure the accumulation of reliable data, the experiments to collect data will be conducted through online surveys. Due to the current global situation through the Covid19 pandemic, a completely controlled environment is not a feasible option. With the help of the thesis supervisor, we seek to ensure that the survey will have all necessary aspects and structure to ensure the level of quality expected when designing and implementing the experiments required to satisfy the research.

3.1 Respondents

The study was conducted online through the use of software such as Qualtrics to make the creation, delivery, collection and analysis more streamlined. Expected respondents were reached through online respondent service Prolific. For this research we brought

together a sample group size of 132 respondents. Our target sample range were people between the ages of twenty (20) and sixty (60). Ideally, we wanted to achieve a balance of 50% respondents being females and 50% being males. Due to their different backgrounds, we hoped to see a difference in their responses in terms of dentist appointment thoughts and experiences as well in terms of their level of involvement (low vs. high). In doing so, manipulating our auditory variables was going to indicate if it had an effect on people's experiences.

Friends, family and acquaintances were expected first to be contacted and to complete the survey. Furthermore, online respondent resource "*Prolific"* allowed us to expand our respondent pool with a low financial cost. Through this investment, we expected cheap and fast respondent growth. The respondents were offered monetary compensation for their completed survey. Through Prolific, we decided upon a 105 NOK per hour reward rate. A secondary online respondent resource was Respondent.io, however this option was secondary because of the larger budgetary needs. Hence, we did not use it.

Next, in order to get an accurate recommended sample size, we used G*Power. G*Power is a free software used to compute statistical power analyses as well as sample size calculations. In our case, we did a power calculation to receive an approximate total sample size (Universität Düsseldorf, 2021). First, in order to get the total sample size, we needed to know which statistical test would fit the best our study. For our study, the best statistical test to use was the two-way mixed ANOVA model (or also called the ANOVA: repeated measures, within-between interaction) as it examined the effect of two factors (music tempo and gender) on a dependent variable (perceived emotions). We will discuss this decision in more detail in the next section. Next, we had to fill in the input parameters. First, in order to get the effect size f, we used the partial eta squared η^2 of 0,02 (which is the smallest partial eta square) which gave us a total effect size f = 0,14. Second, we used a p-value with $\alpha = 0.05$ and a confidence interval of 95%. Third, the number of groups were 2 (male vs female) and the number of measurements were 3 (slow vs medium vs fast tempo). After running it through G*Power, we were given an approximate total sample size of 128 respondents (*Appendix 1*).

3.2.Experiment Design

Through an online survey-based data gathering, we collected Quantitative data for the analysis. The experiment was designed in such a way that we hoped to observe the impact of music tempo on a patient's experience in a dental office. The survey offered the primary data, whereas previous research on the effect of music offered the secondary data. Through both, we hoped to find a correlation between music and how it affects a dental appointment experience.

Three musical tempos (slow, medium, and fast) were played for all the respondents. This was done to check whether music tempo had an influence on perceived emotions of respondents in a dental appointment environment. For the experiment, we used a 3x2 between-subject design. Three musical tempos (slow, medium, and fast) as well as 2 genders (male and female), the randomized between-subjects design had perceived emotions (tense, nervous, excited, calm, and relaxed) as the dependent variable.

3.3. Stimuli

In order to test the effect of music, we needed to incorporate audio clips into the online survey. To avoid any musical bias, we avoided lyrical music. By choosing instrumental only music, we could manipulate the bpm, beats per minute, and focus on the effects of just the music and its pace on the perceived experience and thoughts while at a dentist appointment.

To ensure the equal effect of the audio clips, all three were equal in length and volume. These audio clips were made by the same artist in order to ensure a similar use of instrumentation and recording quality to eliminate any secondary effects, and to focus only on the effects of tempo. All the audio clips with modified tempo were coming from the same song. The audio selected was copyright free to ensure the legal use of the song. The tempo was then sped up or slowed down with the use of musical software to ensure we achieved the desired different tempos and bpm on the same song. This was done to ensure that the only variable was tempo. By using different audio clips, different instrumentation, rhythm, genres among others would add additional variables making the measurement of tempo's effect less precise and confound our results.

Due to current Covid19 constraints, we were unable to conduct the experiment on locations. In turn, this was an online based research which required active respondent participation. These respondents needed to put themselves into a dentistry state of mind by thinking about previous negative experiences at a dentist (surgery, wisdom teeth removal, braces, etc.) taking any steps they deemed necessary to improve the sensation and memory recapture. We provided the auditory and textual content to enhance this imagery.

3.3.1 Music Tempo

In order to find the musical tempos to test, we researched what would be considered a range of musical tempos. For this experiment, we focused on three bpm. Slow: 60 bpm, Medium: 100 bpm, Fast: 120 bpm (Liu et al., 2018). In order to ensure a reasonable response time for our survey, the audio clips were limited to 25 seconds. This was enough time to ensure the tempo was recognized and also not too long to overcome the imagery of a negative dentist appointment.

3.3.2 Control Experience

For our control responses, we depended greatly on the respondents' involvement in the experiment. As previously mentioned, Covid19 has restricted the possibility to conduct an on-location experiment. To gather control, the respondents were required to think back on a dentist appointment and their thoughts and reactions to said appointment. It was imperative we had them think of a negative experience (painful or uncomfortable procedures) instead of a pleasurable one for example the removal of braces or pain relief. To do so, the survey clearly indicated that they must imagine the negative ones to understand the negative thoughts they had from the past and cross examined these thoughts with the thoughts and reactions to musical tempo and the effect it had on their feelings (Michel et al, 2017).

3.4 Variables

3.4.1 Independent Variables

Musical Tempo: As the primary independent variable, we manipulated the tempo of a musical audio clip. The 3 different tempo levels were slow (60 bpm), medium (100 bpm) and fast (120 bpm). By using the same audio and manipulating the tempo, we ensured that the respondents' emotions or thoughts were only influenced by the changes of tempo and not by other variables. Thus, it allowed us to pinpoint the driver of the effects on emotions and thoughts.

Gender: The secondary independent variable in our study was gender (male vs female). By measuring the effects each different tempo had on different sex, we were able to analyze if gender had an effect when measuring a respondents' thoughts and emotions relative to the changes in the audio clips.

3.4.2 Dependent Variable

Customer Perceived Emotions: To measure the respondent's emotions about a dental experience, we adapted a 5-Point Likert scale to measure the level in which each respondent reacted to each audio clip. Based on the circumplex model of affect by Russell, we decided to focus on five main emotions being: tense, excited, nervous, calm, and relaxed. The reason why we decided to focus on these five emotions and no other emotions was because, according to Russell, tense and nervous emotions are considered as negative and unpleasant emotions while calm, excited, and relaxed emotions are considered as positive and pleasant emotions. Another reason was because, on the circumplex model of affect, these emotions were placed on the opposite sides which means they were very different. Thus, our goal was to have both positive/pleasant (calm, relaxed, and excited) and negative/unpleasant (tense, nervous) perceived emotions.

3.5 Procedure

In order to research our hypotheses, we implemented a quantitative study through a survey-based experiment (Malhorta, 2010). Due to current Covid19 restrictions, we

were unable to conduct the experiment in person at a dental office. Instead, the experiment was conducted online with steps implemented to further enhance the dental office experience. By implementing such steps to enhance the experience, we believed the experiment would achieve greater levels of a controlled environment, recommended by Malhorta (2010) as a potential factor to increase the effectiveness of the experiment. To enhance the dental procedure experience, respondents were first asked to listen to an audio clip that included the sounds of drills, suction machines and other tools commonly used in a dental practice. The respondents were also asked to remember a negative dentist experience in the most detailed manner possible to get their feelings and emotions as close to that negative experience as we could through an online experiment.

Before the final data collection, we conducted an initial experiment. This survey was distributed through social media. Upon receiving those results and recommendations from the respondents, we found a great issue that needed to be resolved. This experiment only presented each respondent with one random audio from the three different tempos. Therefore, we were only able to gather the respondents' reactions to one audio. For the final experiment, we concluded that we would randomize and present all three audios to every respondent. By doing so we would ensure the gathering of data to observe a respondent’s different reactions to different tempo speeds.

At the beginning of the final experiment, the respondents were asked to remember a negative dental procedure experience. The respondent participation required them to remember a negative experience, to enhance this feeling we included an initial audio clip containing the sounds of drills and tools commonly used in a dental office, followed by a question to measure the respondent’s feelings and thoughts of such sound to ensure they are experiencing negative emotions when analyzing the data.

The following section was the tempo manipulation section. Each respondent listened to all the audio clips at the different tempos (60, 100, and 120 bpm). However, the order in which these appear was randomized to avoid any linear tempo increase, order effects, or decrease bias. After each audio clip, the participants responded to questions measuring their thoughts and emotions relative to the clip. The full survey design can be found on *Appendix 2.*

Finally, the respondents answered general demographic questions including gender, which further helped in our data analysis to find if tempo differences have a different effect dependent on the respondents' gender.

3.6 Privacy Considerations

To ensure our survey complies with General Data Protection Regulation (GDPR), our experiment included a section where we ask the respondents for consent to collect their responses. We took all necessary steps to ensure the respondents privacy through the online data collection tools offered to ensure the anonymity of the responses (Malhorta, 2010).

3.7 Data Analysis Procedure

3.7.1 Data Preparation

To ensure the highest quality of our data and the analysis of said data, Malhorta's data preparation process was followed (2010). A visual inspection of the survey responses ensured the completion of all the surveys within a reasonable time frame which we found to be an estimated 10 minutes per respondent to complete the survey. The data collection through Prolific yielded zero incomplete surveys, all completed within a reasonable amount of time which gave us the confidence the respondent answered the surveys in a comprehensive manner. Furthermore, for ease of data analysis, textual data was re-coded into numerical data with value ranges different depending on the number of possible responses per question.

3.7.2 Consistency Check

As a further data and result quality check and reliability, descriptive statistics was employed. By observing the minimum and maximum values in the data per question, we were able to identify any outliers which could negatively affect our analysis (Malhorta, 2010). Once more, we found no obvious data inconsistencies which offered us the assurance that the data was ready to be analyzed in a reliable manner.

3.7.3 Analysis

Our study was made of two independent variables being music tempo (with three different levels being slow vs medium vs fast) and gender (male vs female). Next, in order to avoid order effects, all the participants had to undergo all the conditions which meant listening to the three songs in random order. Thus, we had a 3 x 2 within-between factorial design as music tempo was a within-units variable and gender (which was our second factor) was a between-units variable. Once the data has been prepared and we have cross checked the validity of the responses to retain a high level of result accuracy, we decided upon a mixed ANOVA within-between subject interaction analysis (or also called the ANOVA: repeated measures, within-between interaction) through the use of SPSS. This analysis was chosen because it examined the effects of two factors (music tempo and gender) on a dependent variable (perceived emotions). Moreover, we wanted to compare the mean differences between groups which were split into two different types of factor variables. Our first factor was a within-subject independent variable (music tempo with three different levels being slow vs medium vs fast), and our second factor was a between-subject independent variable (gender with two levels male vs female).

Furthermore, the mixed ANOVA analysis offered insight into whether the mean difference on perceived emotions based on musical tempo slow, medium or fast was statistically significant. We also included simple descriptive statistical analysis to further increase the understanding of musical tempo on a respondents perceived negative or positive emotions in a dental environment. The mixed ANOVA analysis was conducted separately for each of the five emotions being tested. We used results in the Greenhouse-Geisser row of the ANOVA analysis to find if statistical evidence was found to support the hypotheses we tested.

4. Results

4.1. Mixed ANOVA Between Gender and Music Tempo for Tense Emotion

The descriptive statistics tables show that the mean value of fast tempo music with tense emotion, for male respondents is higher (M=2.70) as compared to females

(M=2.09). The mean value of slow tempo music is higher for male respondents (M=3.52) than female respondents (M=3.46). Moreover, for medium tempo music and tense emotions, the value of male respondents is again higher for males (M=3.58) than females (M=3.24). This indicates that male respondents feel more tense listening to music for all the three tempos i.e., fast, slow and medium.

Table 1: Descriptive Statistics Tense Emotion

	Gender	Mean	Std. Deviation	N
Fast Tempo Tense Emotion	Male	2.70	1.293	64
	Female	2.09	1.194	68
	Total	2.39	1.276	132
Slow Tempo Tense Emotion	Male	3.52	1.168	64
	Female	3.46	1.275	68
	Total	3.48	1.220	132
Medium Tempo Tense Emotion	Male	3.58	1.110	64
	Female	3.24	1.198	68
	Total	3.40	1.165	132

Next, the test of within-subject effects (*Appendix 3.1*) tells us if there is an overall difference between the mean value of fast, medium and slow tempo music and a respondent's tense emotion. Considering Greenhouse-Geisser row for tempo, the result indicates that the mean score for music tempo were statistically significantly different [F (2,260) = 52.654, p=0.000 < .05]. This indicates that there exists a statistically significant difference in respondents with respect to listening to fast, medium and slow music.

Table 2: Tests of Within-Subjects Effects Tense Emotion - Measure: Tempo

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion (Tense)	Sphericity Assumed	97.445	2	48.722	51.880	.000
	Greenhouse-Geisser	97.445	1.851	52.654	51.880	.000
	Huynh-Feldt	97.445	1.891	51.540	51.880	.000
	Lower-bound	97.445	1.000	97.445	51.880	.000

Finally, the test of between-subject effects represents the ANOVA results for our between group variable, gender. Since the p-value in the significance column is .035 which is smaller than .05, we can conclude that main effect for gender is statistically significant and males and female respondents have a difference in feeling tense listening to music for all the three tempos i.e., fast, slow and medium.

Table 3: Tests of Between-Subjects Effects Tense Emotion - Measure: Tempo

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3792.377	1	3792.377	1515.318	.000
Gender	11.377	1	11.377	4.546	.035
Error	325.350	130	2.503		

4.2. Mixed ANOVA Between Gender and Music Tempo for Excited Emotion

The descriptive statistics tables show that the mean value of fast music with excited emotion, for female respondents is higher (M=3.21) as compared to males (M=2.94). The mean value of slow music is higher for female respondents (M=3.84) than male respondents (M=3.45). Moreover, for medium tempo music and emotion of excitement, the value of female respondents is again higher (M=3.31) than males (M=3.00). This indicates that female respondents feel more excited listening to music for all the three music tempos i.e., fast, slow and medium as compared to males.

Table 4: Descriptive Statistics Excited Emotion

	Gender	Mean	Std. Deviation	N
Fast Tempo Excited Emotion	Male	2.94	1.413	64
	Female	3.21	1.322	68
	Total	3.08	1.368	132
Slow Tempo Excited Emotion	Male	3.45	1.112	64
	Female	3.84	1.031	68
	Total	3.65	1.084	132
Medium Tempo Excited Emotion	Male	3.00	1.069	64
	Female	3.31	1.213	68

	Total	3.16	1.151	132

Next, the test of within-subject effects (*Appendix 3.2*) tells us if there is an overall difference between the mean value of fast, medium and slow tempo music with excited emotion. Considering Greenhouse-Geisser row for tempo, the result indicates that the mean score for music tempo were statistically significantly different [F (2, 260) = 15.307, p=0.000 < .05]. This indicates that there exists a statistically significant difference in respondents with respect to listening to fast, medium and slow music.

Table 5: Tests of Within-Subjects Effects Excited Emotion - Measure: Tempo

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion (Excited)	Sphericity Assumed	25.393	2	12.697	13.124	.000
	Greenhouse-Geisser	25.393	1.659	15.307	13.124	.000
	Huynh-Feldt	25.393	1.691	15.020	13.124	.000
	Lower-bound	25.393	1.000	25.393	13.124	.000

Finally, the test of between-subject effects represents the ANOVA results for our between-group variable, gender. Since the p-value in the significance column is .041 which is smaller than .05, we can conclude that main effect for gender is statistically significant and males and female respondents have a difference in feeling excited when listening to music for all the three tempos i.e., fast, slow and medium.

Table 6: Tests of Between-Subjects Effects Excited Emotion - Measure: Tempo

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	4283.955	1	4283.955	1791.174	.000
Gender	10.177	1	10.177	4.255	.041
Error	310.921	130	2.392		

4.3. Mixed ANOVA Between Gender and Music Tempo for Relaxed Emotion:

The descriptive statistics tables show that the mean value of fast music with relaxed emotion, for female respondents is higher (M=4.04) as compared to males (M=3.69). The mean value of slow tempo music is higher for female respondents (M=2.71) than male respondents (M=2.36). Moreover, for medium tempo music and relaxed emotions, the value of female respondents is again higher (M=2.91) than males (M=2.55). This indicates that female respondents feel more relaxed listening to music for all the three music tempos i.e., Fast, slow and medium as compared to males.

Table 7: Descriptive Statistics Relaxed Emotion

	Gender	Mean	Std. Deviation	N
Fast Tempo Relaxed Emotion	Male	3.69	1.220	64
	Female	4.04	1.014	68
	Total	3.87	1.128	132
Slow Tempo Relaxed Emotion	Male	2.36	1.264	64
	Female	2.71	1.328	68
	Total	2.54	1.304	132
Medium Tempo Relaxed Emotion	Male	2.55	1.053	64
	Female	2.91	1.243	68
	Total	2.73	1.165	132

Next, the test of within-subject effects (*Appendix 3.3*) tells us if there is an overall difference between the mean value of fast, medium and slow tempo music with a respondent's relaxed emotion. Considering Greenhouse-Geisser row for tempo, the result indicates that the mean score for music tempo were statistically significantly different [F (2, 260) = 81.118, p=0.000 < .05]. This indicates that there exists a statistically significant difference in respondents with respect to listening to fast, medium and slow music.

Table 8: Tests of Within-Subjects Effects Relaxed Emotion - Measure: Tempo

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion	Sphericity Assumed	136.612	2	68.306	80.029	.000

	Greenhouse-Geisser	136.612	1.684	81.118	80.029	.000
	Huynh-Feldt	136.612	1.717	79.569	80.029	.000
	Lower-bound	136.612	1.000	136.612	80.029	.000

Finally, the test of between-subject effects represents the ANOVA results for our between group variable, gender. Since the p-value in the significance column is .029 which is smaller than .05, we can conclude that main effect for gender is statistically significant and males and female respondents have a difference in feeling relaxed when listening to music for all the three tempos i.e., fast, slow and medium.

Table 9: Tests of Between-Subjects Effects Relaxed Emotion - Measure: Tempo

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3662.536	1	3662.536	1430.308	.000
Gender	12.536	1	12.536	4.895	.029
Error	332.886	130	2.561		

4.4. Mixed ANOVA Between Gender and Music tempo for Calm Emotion

The descriptive statistics tables show that the mean value of fast music with calm emotion, for female respondents is higher (M=4.12) as compared to males (M=3.56). The mean value of slow tempo music is higher for female respondents (M=2.65) than male respondents (M=2.31). Moreover, for medium tempo music and calm emotion, the value of female respondents is again higher (M=2.91) than males (M=2.64). This indicates that female respondents feel calmer when listening to music for all the three music tempos i.e., Fast, slow and medium as compared to males.

Table 10: Descriptive Statistics Calm Emotion

	Gender	Mean	Std. Deviation	N
Fast Tempo Calm Emotion	Male	3.56	1.180	64
	Female	4.12	.939	68

	Total	3.85	1.095	132
Slow Tempo Calm Emotion	Male	2.31	1.220	64
	Female	2.65	1.313	68
	Total	2.48	1.275	132
Medium Tempo Calm Emotion	Male	2.64	1.045	64
	Female	2.91	1.206	68
	Total	2.78	1.135	132

Next, the test of within-subject effects (*Appendix 3.4*) tells us if there is an overall difference between the mean value of fast, medium and slow tempo music with respondent's calm emotion. Considering Greenhouse-Geisser row for tempo, the result indicates that the mean score for music tempo were statistically significantly different [F (2, 260) = 73.305, p=0.000<.05]. This indicates that there exists a statistically significant difference in respondents with respect to listening to fast, medium and slow music.

Table 11: Tests of Within-Subjects Effects Calm Emotion - Measure: Tempo

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion	Sphericity Assumed	134.960	2	67.480	74.552	.000
	Greenhouse-Geisser	134.960	1.841	73.305	74.552	.000
	Huynh-Feldt	134.960	1.881	71.763	74.552	.000
	Lower-bound	134.960	1.000	134.960	74.552	.000

Finally, the test of between-subject effects represents the ANOVA results for our between group variable, gender. Since the p-value in the significance column is .011 which is smaller than .05. So, we can conclude that the main effect for gender is statistically significant and males and female respondents have a difference in feeling calm for all the three tempos i.e., fast, slow and medium.

Table 12: Tests of Between-Subjects Effects Calm Emotion - Measure: Tempo

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	3637.133	1	3637.133	1647.737	.000
Gender	14.810	1	14.810	6.709	.011
Error	286.956	130	2.207		

4.5. Mixed ANOVA Between Gender and Music Tempo for Nervous Emotion

The descriptive statistics tables show that the mean value of fast tempo music with nervous emotion, for male respondents is higher (M=3.06) as compared to females (M=2.32). The mean value of slow nervous music is higher for male respondents (M=3.72) than female respondents (M=3.34). Moreover, for medium tempo nervous music, the value of male respondents is again higher (M=3.58) than females (M=3.37). This indicates that male respondents feel more nervous listening to music for all the three music tempos i.e., Fast, slow and medium as compared to females.

Table 13: Descriptive Statistics Nervous Emotion

	Gender	Mean	Std. Deviation	N
Fast Nervous	Male	3.06	1.390	64
	Female	2.32	1.057	68
	Total	2.68	1.280	132
Slow Nervous	Male	3.72	1.076	64
	Female	3.34	1.087	68
	Total	3.52	1.095	132
Medium Nervous	Male	3.58	1.232	64
	Female	3.37	1.064	68
	Total	3.47	1.149	132

Next, the test of within-subject effects (*Appendix 3.5*) tells us if there is an overall difference between the mean value of fast, medium and slow tempo music with a respondent's nervous emotions. Considering Greenhouse-Geisser row for tempo, the result indicates that the mean score for music tempo were statistically significantly different [F (2, 260) = 32.494, p=0.000 < .05]. This indicates that there exists a

statistically significant difference in respondents with respect to listening to fast, medium and slow music.

Table 14: Tests of Within-Subjects Effects Nervous Emotion - Measure: Tempo

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion	Sphericity Assumed	57.557	2	28.778	38.572	.000
	Greenhouse-Geisser	57.557	1.771	32.494	38.572	.000
	Huynh-Feldt	57.557	1.808	31.838	38.572	.000
	Lower-bound	57.557	1.000	57.557	38.572	.000

Finally, the test of between-subject effects represents the ANOVA results for our between group variable, gender. Since the p-value in the significance column is .006 which is smaller than .05. So, we can conclude that the main effect for gender is statistically significant and males and female respondents have a difference in the level of feeling of nervousness for all the three tempos i.e., fast, slow and medium.

Table 5: Tests of Between-Subjects Effects Nervous Emotion - Measure: Tempo

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	4131.378	1	4131.378	1646.345	.000
Gender	19.439	1	19.439	7.746	.006
Error	326.225	130	2.509		

4.6. Descriptive Statistics Analysis

Descriptive statistics were analyzed for each of the different audio clips presented to the respondents. A control audio of a dentist office sounds, slow medium and high tempo music, all while the respondents participated in the survey as they recalled a negative dentistry experience. We used the percentage of the highest level of agreement or disagreement between the audio clip and the level to which the respondents felt each of the 5 emotions being tested. The complete descriptive statistics tables can be found on *Appendix 4*. According to the descriptive analysis, out of 132 respondents, 51.5% were females and 48.5% were males.

4.6.1 Control Dentistry Environment Audio

Out of the 132 collected responses, we first asked to respond on a 5-point Likert scale how tense the audio clip made the respondents feel. At 48.5% of the responses, 64 answered that the control audio made them strongly agree with feeling tense. Whilst 36.4% strongly agreed to feeling nervous by the audio being played. In terms of the positive emotions (excited, relaxed and calm), these only reached a high of 1.5% of respondents strongly agreeing that the audio made them feel those emotions, with strongly disagree being the highest chosen option between 47.7% and 69.7% of the responses.

4.6.2 Fast Tempo Audio

Out of the 132 collected responses, we first asked to respond on a 5-point Likert scale how tense the audio clip made the respondents feel. At 30.3% of the responses, 40 answered that the fast tempo audio made them strongly agree with feeling tense. Whilst 39.4% somewhat agreed to feeling nervous by the audio being played. In terms of the positive emotions, the fast tempo reached a 15.2% of responses strongly agreeing to feeling excited. Calm and Relaxed with 2.3% and 3.0% of respondents strongly agreeing to feeling these emotions.

4.6.3 Slow Tempo Audio

Out of the 132 collected responses, we first asked to respond on a 5-point Likert scale how tense the audio clip made the respondents feel. At 5.3% of the responses, 7 answered that the slow tempo audio made them strongly agree with feeling tense. Whilst 3.0% strongly agreed to feeling nervous by the audio being played. In terms of the positive emotions, the slow tempo reached a 2.3% of responses strongly agreeing to feeling excited. And importantly, Calm and Relaxed emotions were ranked the highest in strongly agreed emotions with 26.5% and 24.2% of respondents strongly agreeing to feeling these emotions. The highest chosen option for Calm and Relaxed was the somewhat agreed emotion with 31.8% and 36.4% respectively.

4.6.4 Medium Tempo Audio

Out of the 132 collected responses, we first asked to respond on a 5-point Likert scale how tense the audio clip made the respondents feel. At 6.1% of the responses, 8 answered that the medium tempo audio made them strongly agree with feeling tense. Whilst 4.5% strongly agreed to feeling nervous by the audio being played. The highest chosen option for Calm and Relaxed was the somewhat agreed emotion with 41.7% and 43.9% respectively.

4.6.5 Musical Preferences

The final analysis we conducted is through the descriptive analysis of musical preferences of the respondents. Out of the 132 respondents, the highest ranked audio clip was Audio 2 which was the slow tempo audio clip. 44.7% of the total respondents ranked slow tempo music as their preferred audio clip to listen to while in a dental appointment. In comparison, fast and medium tempo audio received 5.3% and 31.1% respectively, with 18.9% preferring not to listen to any music during a dental appointment. Finally, when ranking the audio clips in order of which made them most to least nervous, 75.8% of respondents placed the control audio of medical sounds as the most nerve inducing. As second most nervous emission inducing, fast tempo audio placed in second place 62.1% of the responses. The slow audio ranking as the least nervous inducing by reaching the least nervous rating 59.1% total. A similar analysis was conducted to rank the most to least relaxing audio clips. Slow tempo music ranked as most relaxing 62.9% of the time with fast tempo music being ranked as the least relaxing 57.6% of the total responses received.

5. Summary of Results

Taking into account the statistical evidence as well as descriptive evidence recovered from the experiment, we find that musical tempo regardless of the category Slow, Medium and Fast have a significant effect on the respondents perceived emotions. Considering Greenhouse-Geisser, for all emotions we find a significant correlation

between the perceived emotion and the tempo of the audio clip being played. This significance allows us to support both H1a and H1b. Similarly, we found evidence to support hypotheses H2a with significant results indicating the effect of gender on a respondent perceived emotion to the musical tempo. However, we do not find enough evidence to support H2b.

Table 16: Hypotheses Results

Hypotheses	Variables	Results
H1a	*Slow tempo audio, relative to medium and fast tempo, will positively enhance the patient's emotions during a medical procedure at a dental office. Positive valence (relaxed/calm/excited)*	Supported
H1b	*Fast tempo audio, relative to medium and slow tempo, will negatively enhance the patient's emotions during a medical procedure at a dental office. Negative valence (tense/nervous)*	Supported
H2a	*Gender as a significant factor to slow tempo music having a positive effect on perceived emotions in a dentist environment*	Supported
H2b	*Gender as a significant factor to fast tempo music having a positive effect on perceived emotions in a dentist environment*	Not Supported

6. General Discussion

As mentioned in the introduction, according to Krishna (2012), multisensory marketing is "an application of the understanding of sensation and perception to the field of marketing, to consumer perception, cognition, emotion, learning, preference choice or evaluation". With this in mind, the purpose of our thesis was to research if there is a way for a patient's experience to be improved through the implementation of auditory cues. This improvement in perceived emotions, we believe, will greatly improve a customer's experience when visiting a dental practice.

By researching through the academic literature, we found evidence describing the effect music tempo can have on a person in terms of the healing effects of music (Thoma et al., 2013). Leading us to develop the research question:

"Does musical tempo have an effect on a patient's perceived emotions at a dental office and how it depends on the gender of the patient?"

To find a solution to this question we researched if different musical tempo effects on a patient's emotions (Michel et al., 2017) would have the same effect in positively affecting a patient's perceived emotions and experience during a dental procedure. We tested these hypotheses through an online based survey distributed to 132 respondents on Prolific.

6.1 Overall Findings

As concluded by Michel et al. (2017), and the effect of musical tempo on a customer's emotions, we set out to discover if the same effect would apply to medical patients going through a negative dentistry experience and to manipulate their perceived emotions to improve the customer experience to become less negative. Our mixed ANOVA analysis offered the evidence to support both H1a and H1b. For all 5 emotions being tested, the statistical differences support the claim that positive valence emotions are heightened by slow tempo audio while negative valence emotions are increased by fast tempo audio. Throughout the analysis, Sig. levels (p) were always lower than 0.05, indicating the statistically significant difference within the respondent's emotions in respect to listening to the different audios. This claim is further supported by descriptive statistical analysis indicating a preference among male and females to choose the slower tempo audio as the preferred choice to listen to during a medical procedure with a total of 44.7% of respondents. The remaining choices, as we had hoped, were medium tempo as the second choice with 31.1% and fast tempo and no audio coming in close fourth and fifth choices with 5.3% and 18.9% respectively. The emotional reactions and preferences in a dental procedure further support the claims that a customer's emotions can be affected by musical tempo (Michel et al., 2017).

Analyzing H2a, we hypothesized that gender was a significant factor in terms of slow music having a positive effect on a patient's emotions in a dentist environment. Through further descriptive statistics for the positive valence emotions, we found that for all positive emotions (Excited, Relaxed and Calm), the mean value for female respondents feeling these positive emotions was higher than male respondents for all audio tempos tested. To further support this claim, test of between-subject effects with the group variable gender indicates a statistically significant difference between

females and males. With p-values all smaller than 0.05 in all between-subject tests for excited, relaxed and calm emotions (0.041 excited, 0.029 relaxed, 0.011 calm), we can conclude that the main effect for gender is statistically significant for females and males having a difference in feeling positive valence emotions when listening to slow, medium and fast tempo audio.

Analyzing H2b, we hypothesized that gender was a significant factor in terms of fast music having a positive effect on a patient's emotions in a dentist environment. As concluded in H2a, positive valence emotions were all occupied by the slow tempo music. This leaves only negative valence emotions (Nervous and Tense). Through further descriptive statistics for the negative valence emotions, we found that for all negative emotions (Nervous and Tense), the mean value for male respondents feeling these negative emotions was higher than female respondents for all audio tempos tested. This claim is supported though test of between-subject effects with the group variable gender indicates a statistically significant difference between males and females. With p-values all smaller than 0.05 in all between subject tests for nervous and tense emotions (0.006 Nervous and 0.035 Tense), we can conclude that the main effect for gender is statistically significant for males and females having a difference in feeling negative valence emotions when listening to slow, medium and fast tempo audio.

Through all this analysis we can support our hypotheses H1a, H1b and H2a. We have found statistical evidence that supports our claims that slow tempo, relative to medium and fast tempo audio will positively enhance a patient's positive valence emotions (relaxed, calm and excited) and positively enhance the customer experience. We have also concluded that fast tempo audio, relative to slow and medium tempo will enhance a patient's negative valence emotions (tense and nervous) and negatively affect the customer experience. Finally, we have concluded that gender is a significant factor when having a positive effect on emotions. Female respondents were more susceptible to all three audio tempos when measuring positive valence emotions. We are unable to support the claim that fast tempo audio is significantly affected by gender in having a positive effect on emotions.

6.2 Theoretical Implications

Previous studies in sensory marketing and more precisely in auditory have been focusing mainly on the effects of music tempo in retail stores, restaurants, banks, and other similar stores (Michel et al, 2017). These findings are further supported by our study, indicating the existence of a relationship between a customer's perceived emotions being affected by musical tempo. However, music tempo and its effect on perceived emotions in the health-related field have not been researched. Through this research we are able to expand the existing research done by others, to include the effects of musical tempo on a customer's emotions with a focus in the dental field. Furthermore, this offers future researchers to check into the effects of musical tempo and emotions in other medical fields.

6.3 Managerial Implications

Our results offer managers the evidence that music in a dental office is a strategy worth implementing to influence a patient's experience. As evidenced by our results and the results of previous research such as (Michel et al, 2017). The same way that furniture creates an immediate impression on a patient and can help reduce a customer's anxiety (Dazkir & Marilyn, 2012), dental practices should similarly consider the auditory cues that can further enhance positive valence emotions. Our study proves that slow tempo music will influence a patient's positive emotions and make a dentist procedure a more satisfactory one. Managers should implement systems to have slow audio music playing in the office. We recommend a focus on the waiting room area where the furniture and music will together reduce a patient's negative valence emotions before a procedure. Moreover, having music playing in the areas where the procedures take place can further influence a patient's emotions.

7. Limitations and Future Research

Throughout this study, we have identified several limitations which are essential to acknowledge and should be taken into consideration for future research. First, due to the global Covid19 pandemic, we were not able to conduct this study in person at a

dental office but we were forced to conduct it online through a survey. Further research should research this study in person during a real dental procedure to have better and more accurate results, and thus have a better understanding of the impact of music tempo on the respondent's perceived emotions. In fact, during our survey, our respondents had to imagine themselves having a bad previous experience during a dental procedure. Imagining such a scenario is not an easy task to do as it is not real. Thus, emotions can be misinterpreted and impact our results. It could have been difficult for them to interpret the emotions they really had felt and on how they were feeling during a bad previous dental procedure, hence, misinterpreting their emotions. However, conducting this experiment in real life would be easier for the respondents as they could interpret their emotions better and they would not have to imagine such a scenario but actually be in a real scenario. Hence, the results would be stronger.

Second, another limitation, which is due to the first limitation (Covid19), is the fact that we conducted a short-term experiment. Future research should consider conducting a long-term experiment in person to test all three audio clips (slow vs medium vs fast tempo) with each respondent during three different dental appointments. Presenting all three audio clips during one real dental procedure is not ideal and probably not feasible due to time constraints. Having a long-term experiment would give stronger results as the respondents would have the opportunity to experience all the audio tempo's and the emotions they induce. Through this more detailed data, future researchers will have further evidence to support or reject our conclusions.

Third, another limitation is the total sample size. In fact, even though G*Power gave us an approximate number of 128 respondents, our goal was to have more respondents than that. However, due to resource limitations, we conducted the study with 132 respondents. Hence, for future research, it would be interesting to increase the number of respondents to have even stronger results.

Fourth, the fact that the respondents were not able to choose their own audio clips is another limitation. In fact, for future research, it could be interesting to let the respondents get to choose their own song and then afterwards check the tempo of those songs to see the effect on perceived emotions. Future researcher will be able to see if they match with our results when we used controlled audio clips.

Lastly, our study did not include the current state of mind and feelings of the participants. In fact, if before a dental appointment a patient is feeling sad, angry, happy, stressed, due to other factors outside of the dental office and things happening in their life; this could influence the patient's current state of mind when taking the survey. Hence, for future research, we would recommend clarifying the current patient's personal situation and state of mind before answering the survey as it could impact the results.

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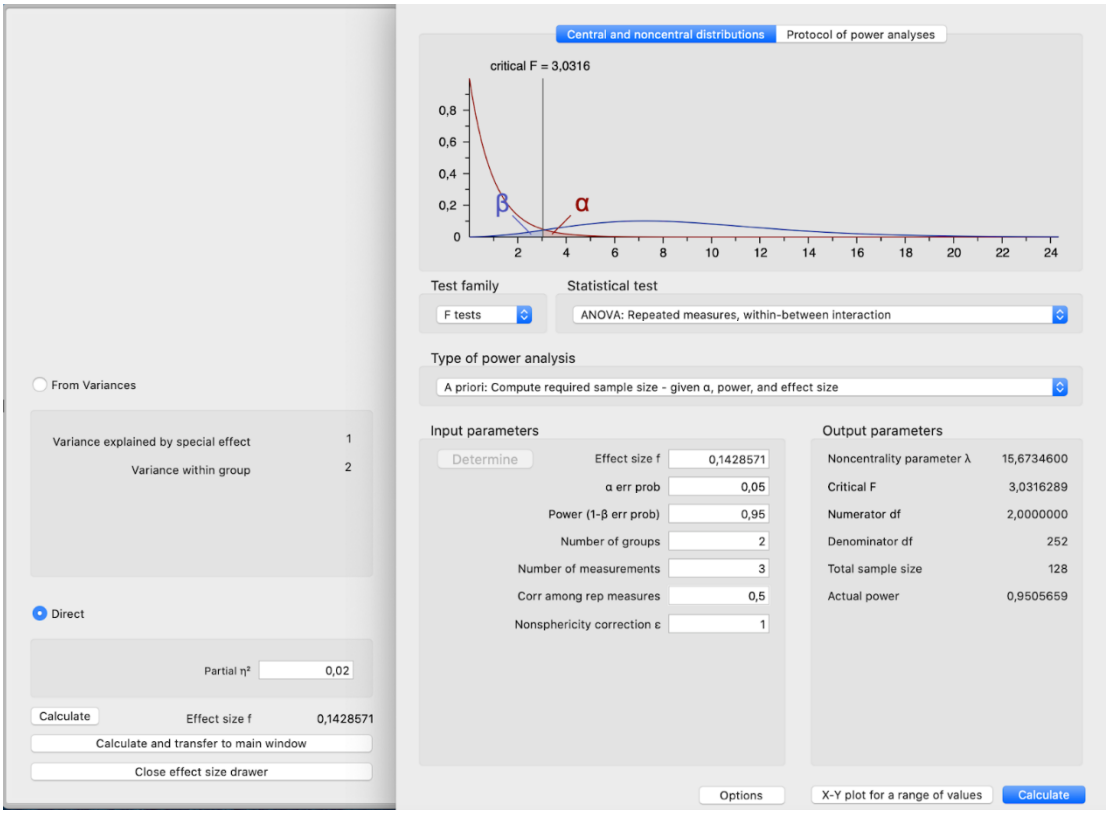
9. Appendix

*Appendix 1: G*Power Sample Size Estimation*



Appendix 2: Study Given to the Respondents on Qualtrics

Welcome to our study!

In this study, led by Jeanne Masson and Felipe Zambrano, second-year master students at BI Norwegian Business School. Your answers will be used as a part of our Master Thesis in Strategic Marketing Management at BI Norwegian Business School. .

In this study we are interested in your reactions to a set of audio tracks and the effect they have on perceived emotions of a previous negative dental appointment.
If you decide to take part, we will play different audios, and ask you to respond to a few questions about them. The procedure will take approximately 10 minutes.

In order to participate in the study, you need to be able to play the audio clearly from your device. There are no right or wrong answers, please respond according to what feels right to you. We hope you enjoy it. Your participation is very important to us.
If you have any questions about the research study, please contact the MSc. students responsible for this research, Ms. Jeanne Masson (jeanne.masson@student.bi.no) or Mr. Luis Felipe Zambrano (luis.f.zambrano@student.bi.no).

○ I consent that I voluntarily participate in this study (1)

Statement of Consent

1. I have read and understood the information about this experiment and it's general purpose
2. I understand that I can withdraw from the questionnaire at any time, for any reason, and without penalty, and by doing so will destroy my data. (NB - Please be aware that the data colleted is anonymous - if you change your mind after completing the experiment, we will be unable to trace your specific data to remove it).
3. I understand how to raise a concern or make a complaint (detailed above).
4. I understand that my responses are anonymous.
5. I agree to take part in this online experiment.

Do you agree to take part?

○ I Agree to Terms (1)

○

We would like you to imagine a negative experience you have had at a dentist (ex. tooth removal, surgery, braces, wisdom teeth). Please think of a painful or uncomfortable experience. Think of the sounds in the dental office, the sights, the smells.

We recommend you take some moments to close your eyes, put your body in a similar

position you were in during that moment, in order to enhance the feeling and memory recollection of such experience.

Once you have fully remembered this negative experience you will be asked some questions on your emotions.

Listen to the following clip to help you better imagine the sounds at a dental office.

Q1 The previous audio track while thinking of my previous negative dental experience, makes me feel_____

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Tense (1)	○	○	○	○	○
Excited (2)	○	○	○	○	○
Relaxed (3)	○	○	○	○	○
Calm (4)	○	○	○	○	○
Nervous (5)	○	○	○	○	○

Please listen to the following audio track, keep the negative dental experiences in mind as you listen.

Q2 The previous audio track while thinking of my previous negative dental experience, makes me feel_____

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Tense (1)	○	○	○	○	○
Excited (2)	○	○	○	○	○
Relaxed (3)	○	○	○	○	○
Calm (4)	○	○	○	○	○
Nervous (5)	○	○	○	○	○

Q3 I like the music I just listened to

- ○ Strongly agree (1)
- ○ Somewhat agree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat disagree (4)
- ○ Strongly disagree (5)

Please listen to the following audio track, keep the negative dental experiences in mind as you listen.

Q4 The previous audio track while thinking of my previous negative dental experience, makes me feel_____

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Tense (1)	○	○	○	○	○
Excited (2)	○	○	○	○	○
Relaxed (3)	○	○	○	○	○
Calm (4)	○	○	○	○	○
Nervous (5)	○	○	○	○	○

Q5 I like the music I just listened to

- ○ Strongly agree (1)
- ○ Somewhat agree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat disagree (4)
- ○ Strongly disagree (5)

Please listen to the following audio track, keep the negative dental experiences in mind as you listen.

Q6 The previous audio track while thinking of my previous negative dental experience, makes me feel_____

	Strongly agree (1)	Somewhat agree (2)	Neither agree nor disagree (3)	Somewhat disagree (4)	Strongly disagree (5)
Tense (1)	○	○	○	○	○
Excited (2)	○	○	○	○	○
Relaxed (3)	○	○	○	○	○
Calm (4)	○	○	○	○	○
Nervous (5)	○	○	○	○	○

Q7 I like the music I just listened to

- ○ Strongly agree (1)
- ○ Somewhat agree (2)
- ○ Neither agree nor disagree (3)
- ○ Somewhat disagree (4)
- ○ Strongly disagree (5)

Q8
Please rank the audio clips from most to least (1 being most and 4 being least) which sound makes you feel the most **Nervous**. The audio clips are included once more if you wish to listen to them again. Keep the negative dental experiences in mind as you listen.

Audio 1

Audio 2

Audio 3

Audio 4

Q9
Please rank the audio clips from most to least (1 being most and 4 being least) which sound makes you feel the most **Relaxed**. The audio clips are included once more if you wish to listen to them again. Keep the negative dental experiences in mind as you listen.

Audio 1

Audio 2

Audio 3

Audio 4

Q10
From these 3 audio tracks, which would you prefer to listen to while at a dentist appointment?

Audio 1

Audio 2

Audio 3

- Audio 1 (1)
- Audio 2 (2)
- Audio 3 (3)
- No Music (4)

Q11 What is your age at the time of completing this survey? Please write full integers only

_____

Q12 Please indicate your gender

- ○ Male (1)
- ○ Female (2)
- ○ Non-binary / third gender (3)
- ○ Prefer not to say (4)

Q13 What is your preferred musical genre?

- ○ Pop (1)
- ○ Rock n Roll (2)
- ○ Electronic (3)
- ○ Classical (4)
- ○ Instrumental (5)
- ○ Other (6) _____

Appendix 3: SPSS Analysis, Tests of Within-Subjects Effects

3.1 Tense

Tests of Within-Subjects Effects						
Measure: Tempo						
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion (Tense)	Sphericity Assumed	97.445	2	48.722	51.880	.000
	Greenhouse-Geisser	97.445	1.851	52.654	51.880	.000
	Huynh-Feldt	97.445	1.891	51.540	51.880	.000
	Lower-bound	97.445	1.000	97.445	51.880	.000
Tense * Gender	Sphericity Assumed	5.081	2	2.541	2.705	.069
	Greenhouse-Geisser	5.081	1.851	2.746	2.705	.073
	Huynh-Feldt	5.081	1.891	2.687	2.705	.072
	Lower-bound	5.081	1.000	5.081	2.705	.102
Error(Emotion_Tense)	Sphericity Assumed	244.176	260	.939		
	Greenhouse-Geisser	244.176	240.586	1.015		
	Huynh-Feldt	244.176	245.786	.993		
	Lower-bound	244.176	130.000	1.878		

3.2 Excited

Tests of Within-Subjects Effects						
Measure: Tempo						
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion (Excited)	Sphericity Assumed	25.393	2	12.697	13.124	.000
	Greenhouse-Geisser	25.393	1.659	15.307	13.124	.000

	Huynh-Feldt	25.393	1.691	15.020	13.124	.000
	Lower-bound	25.393	1.000	25.393	13.124	.000
Emotion * Gender	Sphericity Assumed	.232	2	.116	.120	.887
	Greenhouse-Geisser	.232	1.659	.140	.120	.850
	Huynh-Feldt	.232	1.691	.137	.120	.854
	Lower-bound	.232	1.000	.232	.120	.730
Error(Emotion)	Sphericity Assumed	251.541	260	.967		
	Greenhouse-Geisser	251.541	215.664	1.166		
	Huynh-Feldt	251.541	219.787	1.144		
	Lower-bound	251.541	130.000	1.935		

3.3 Relaxed

Tests of Within-Subjects Effects						
Measure: Tempo						
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion (Relaxed)	Sphericity Assumed	136.612	2	68.306	80.029	.000
	Greenhouse-Geisser	136.612	1.684	81.118	80.029	.000
	Huynh-Feldt	136.612	1.717	79.569	80.029	.000
	Lower-bound	136.612	1.000	136.612	80.029	.000
Emotion * Gender	Sphericity Assumed	.006	2	.003	.003	.997
	Greenhouse-Geisser	.006	1.684	.003	.003	.993
	Huynh-Feldt	.006	1.717	.003	.003	.993
	Lower-bound	.006	1.000	.006	.003	.954
Error(Emotion)	Sphericity Assumed	221.914	260	.854		
	Greenhouse-Geisser	221.914	218.936	1.014		

	Huynh-Feldt	221.914	223.195	.994		
	Lower-bound	221.914	130.000	1.707		

3.4 Calm

Tests of Within-Subjects Effects						
Measure: Tempo						
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion (Calm)	Sphericity Assumed	134.960	2	67.480	74.552	.000
	Greenhouse-Geisser	134.960	1.841	73.305	74.552	.000
	Huynh-Feldt	134.960	1.881	71.763	74.552	.000
	Lower-bound	134.960	1.000	134.960	74.552	.000
Emotion * Gender	Sphericity Assumed	1.465	2	.733	.809	.446
	Greenhouse-Geisser	1.465	1.841	.796	.809	.437
	Huynh-Feldt	1.465	1.881	.779	.809	.440
	Lower-bound	1.465	1.000	1.465	.809	.370
Error(Emotion)	Sphericity Assumed	235.338	260	.905		
	Greenhouse-Geisser	235.338	239.340	.983		
	Huynh-Feldt	235.338	244.484	.963		
	Lower-bound	235.338	130.000	1.810		

3.5 Nervous

Tests of Within-Subjects Effects						
Measure: Tempo						
Source		Type III Sum of Squares	df	Mean Square	F	Sig.
Emotion (Nervous)	Sphericity Assumed	57.557	2	28.778	38.572	.000
	Greenhouse-Geisser	57.557	1.771	32.494	38.572	.000

	Huynh-Feldt	57.557	1.808	31.838	38.572	.000
	Lower-bound	57.557	1.000	57.557	38.572	.000
Emotion * Gender	Sphericity Assumed	4.799	2	2.400	3.216	.042
	Greenhouse-Geisser	4.799	1.771	2.710	3.216	.048
	Huynh-Feldt	4.799	1.808	2.655	3.216	.047
	Lower-bound	4.799	1.000	4.799	3.216	.075
Error(Emotion)	Sphericity Assumed	193.983	260	.746		
	Greenhouse-Geisser	193.983	230.269	.842		
	Huynh-Feldt	193.983	235.014	.825		
	Lower-bound	193.983	130.000	1.492		

Appendix 4: Descriptive Statistics

4.1 Dentist Sound Audio

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Tense

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	64	48.5	48.5	48.5
	Somewhat agree	55	41.7	41.7	90.2
	Neither agree nor disagree	5	3.8	3.8	93.9
	Somewhat disagree	5	3.8	3.8	97.7
	Strongly disagree	3	2.3	2.3	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Excited

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	2	1.5	1.5	1.5
	Somewhat agree	7	5.3	5.3	6.8
	Neither agree nor disagree	24	18.2	18.2	25.0
	Somewhat disagree	36	27.3	27.3	52.3
	Strongly disagree	63	47.7	47.7	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Relaxed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	2	1.5	1.5	1.5
	Somewhat agree	1	.8	.8	2.3
	Neither agree nor disagree	4	3.0	3.0	5.3
	Somewhat disagree	33	25.0	25.0	30.3
	Strongly disagree	92	69.7	69.7	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Calm

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	2	1.5	1.5	1.5
	Somewhat agree	4	3.0	3.0	4.5
	Neither agree nor disagree	13	9.8	9.8	14.4
	Somewhat disagree	31	23.5	23.5	37.9
	Strongly disagree	82	62.1	62.1	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Nervous

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	48	36.4	36.4	36.4
	Somewhat agree	62	47.0	47.0	83.3
	Neither agree nor disagree	14	10.6	10.6	93.9
	Somewhat disagree	7	5.3	5.3	99.2
	Strongly disagree	1	.8	.8	100.0
	Total	132	100.0	100.0	

4.2 Fast Tempo

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Tense

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	40	30.3	30.3	30.3
	Somewhat agree	41	31.1	31.1	61.4
	Neither agree nor disagree	22	16.7	16.7	78.0
	Somewhat disagree	18	13.6	13.6	91.7
	Strongly disagree	11	8.3	8.3	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Excited

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	20	15.2	15.2	15.2
	Somewhat agree	30	22.7	22.7	37.9
	Neither agree nor disagree	30	22.7	22.7	60.6
	Somewhat disagree	24	18.2	18.2	78.8
	Strongly disagree	28	21.2	21.2	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Relaxed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	4	3.0	3.0	3.0
	Somewhat agree	15	11.4	11.4	14.4
	Neither agree nor disagree	24	18.2	18.2	32.6
	Somewhat disagree	40	30.3	30.3	62.9
	Strongly disagree	49	37.1	37.1	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Calm

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	3	2.3	2.3	2.3
	Somewhat agree	14	10.6	10.6	12.9
	Neither agree nor disagree	30	22.7	22.7	35.6
	Somewhat disagree	38	28.8	28.8	64.4
	Strongly disagree	47	35.6	35.6	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Nervous

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	22	16.7	16.7	16.7
	Somewhat agree	52	39.4	39.4	56.1
	Neither agree nor disagree	21	15.9	15.9	72.0
	Somewhat disagree	20	15.2	15.2	87.1
	Strongly disagree	17	12.9	12.9	100.0
	Total	132	100.0	100.0	

4.3 Slow Tempo

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Tense

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	7	5.3	5.3	5.3
	Somewhat agree	26	19.7	19.7	25.0
	Neither agree nor disagree	29	22.0	22.0	47.0
	Somewhat disagree	36	27.3	27.3	74.2
	Strongly disagree	34	25.8	25.8	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Excited

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	3	2.3	2.3	2.3
	Somewhat agree	19	14.4	14.4	16.7
	Neither agree nor disagree	33	25.0	25.0	41.7
	Somewhat disagree	43	32.6	32.6	74.2
	Strongly disagree	34	25.8	25.8	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Relaxed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	32	24.2	24.2	24.2
	Somewhat agree	48	36.4	36.4	60.6
	Neither agree nor disagree	13	9.8	9.8	70.5
	Somewhat disagree	27	20.5	20.5	90.9
	Strongly disagree	12	9.1	9.1	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Calm

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	35	26.5	26.5	26.5
	Somewhat agree	42	31.8	31.8	58.3
	Neither agree nor disagree	22	16.7	16.7	75.0
	Somewhat disagree	22	16.7	16.7	91.7
	Strongly disagree	11	8.3	8.3	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Nervous

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	4	3.0	3.0	3.0
	Somewhat agree	22	16.7	16.7	19.7
	Neither agree nor disagree	35	26.5	26.5	46.2
	Somewhat disagree	43	32.6	32.6	78.8
	Strongly disagree	28	21.2	21.2	100.0
	Total	132	100.0	100.0	

4.4 Medium Tempo

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Tense

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	8	6.1	6.1	6.1
	Somewhat agree	22	16.7	16.7	22.7
	Neither agree nor disagree	38	28.8	28.8	51.5
	Somewhat disagree	37	28.0	28.0	79.5
	Strongly disagree	27	20.5	20.5	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Excited

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	9	6.8	6.8	6.8
	Somewhat agree	30	22.7	22.7	29.5
	Neither agree nor disagree	45	34.1	34.1	63.6
	Somewhat disagree	27	20.5	20.5	84.1
	Strongly disagree	21	15.9	15.9	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Relaxed

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	13	9.8	9.8	9.8
	Somewhat agree	58	43.9	43.9	53.8
	Neither agree nor disagree	26	19.7	19.7	73.5
	Somewhat disagree	21	15.9	15.9	89.4
	Strongly disagree	14	10.6	10.6	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Calm

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	11	8.3	8.3	8.3
	Somewhat agree	55	41.7	41.7	50.0
	Neither agree nor disagree	32	24.2	24.2	74.2
	Somewhat disagree	20	15.2	15.2	89.4
	Strongly disagree	14	10.6	10.6	100.0
	Total	132	100.0	100.0	

The previous audio track while thinking of my previous negative dental experience, makes me feel_____ - Nervous

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	6	4.5	4.5	4.5
	Somewhat agree	24	18.2	18.2	22.7
	Neither agree nor disagree	32	24.2	24.2	47.0
	Somewhat disagree	42	31.8	31.8	78.8
	Strongly disagree	28	21.2	21.2	100.0
	Total	132	100.0	100.0	

4.5 Music Preference

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Audio 1	7	5.3	5.3	5.3
	Audio 2	59	44.7	44.7	50.0
	Audio 3	41	31.1	31.1	81.1
	No Music	25	18.9	18.9	100.0
	Total	132	100.0	100.0	

4.6 Liked the Audio (Fast, Slow, Medium)

I like the music I just listened to

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	16	12.1	12.1	12.1
	Somewhat agree	28	21.2	21.2	33.3
	Neither agree nor disagree	15	11.4	11.4	44.7
	Somewhat disagree	42	31.8	31.8	76.5
	Strongly disagree	31	23.5	23.5	100.0
	Total	132	100.0	100.0	

I like the music I just listened to

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	28	21.2	21.2	21.2
	Somewhat agree	61	46.2	46.2	67.4
	Neither agree nor disagree	16	12.1	12.1	79.5
	Somewhat disagree	18	13.6	13.6	93.2
	Strongly disagree	9	6.8	6.8	100.0
	Total	132	100.0	100.0	

I like the music I just listened to

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Strongly agree	28	21.2	21.2	21.2
	Somewhat agree	57	43.2	43.2	64.4
	Neither agree nor disagree	25	18.9	18.9	83.3
	Somewhat disagree	15	11.4	11.4	94.7
	Strongly disagree	7	5.3	5.3	100.0
	Total	132	100.0	100.0	

4.7 Rank Nervous 1 to 4 (Valid 1: Dentist, 2: Fast, 3: Slow, 4: Medium)

Position 1 (Most Nervous)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	100	75.8	75.8	75.8
	2	18	13.6	13.6	89.4
	3	3	2.3	2.3	91.7
	4	11	8.3	8.3	100.0
	Total	132	100.0	100.0	

Position 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	15.9	15.9	15.9
	2	82	62.1	62.1	78.0
	3	14	10.6	10.6	88.6
	4	15	11.4	11.4	100.0
	Total	132	100.0	100.0	

Position 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	6	4.5	4.5	4.5
	2	19	14.4	14.4	18.9
	3	37	28.0	28.0	47.0
	4	70	53.0	53.0	100.0
	Total	132	100.0	100.0	

Position 4 (Least Nervous)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	5	3.8	3.8	3.8
	2	13	9.8	9.8	13.6
	3	78	59.1	59.1	72.7
	4	36	27.3	27.3	100.0
	Total	132	100.0	100.0	

4.8 Rank Relaxed 1 to 4(Valid 1: Dentist, 2: Fast, 3: Slow, 4: Medium)

Position 1 (Most Relaxed)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	9	6.8	6.8	6.8
	2	2	1.5	1.5	8.3
	3	17	12.9	12.9	21.2
	4	104	78.8	78.8	100.0
	Total	132	100.0	100.0	

Position 2

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	10	7.6	7.6	7.6
	2	21	15.9	15.9	23.5
	3	83	62.9	62.9	86.4
	4	18	13.6	13.6	100.0
	Total	132	100.0	100.0	

Position 3

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	81	61.4	61.4	61.4
	2	33	25.0	25.0	86.4
	3	15	11.4	11.4	97.7
	4	3	2.3	2.3	100.0
	Total	132	100.0	100.0	

Position 4 (Least Relaxed)

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	32	24.2	24.2	24.2
	2	76	57.6	57.6	81.8
	3	17	12.9	12.9	94.7
	4	7	5.3	5.3	100.0
	Total	132	100.0	100.0	

4.9 Gender

Statistics

Please indicate your gender

N	Valid	132
	Missing	0

Please indicate your gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	64	48.5	48.5	48.5
	Female	68	51.5	51.5	100.0
	Total	132	100.0	100.0	