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The effect of musical tempo and volume on the waiting time and price perception of customers

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Abstract

This research investigates the effect of music tempo and volume on customers' price and waiting time perceptions. A field study was conducted in a bakery in Belgium, in which the tempo and volume of the background music was varied for customers that were waiting in line. Results showed that waiting time perceptions are higher when the tempo of the background music is high rather than low. We further showed that this effect is only observed when the background music was noticed. Furthermore, we found that heightening the volume of the background music lowers wait time estimates. Concerning price perceptions, we showed that prices were perceived as lower in the intermediate stimulation conditions. That is to say, price perceptions were lowest in the low-tempo/high-volume and high-tempo/low-volume condition. We suggest a pacemaker accumulator model of time perception that confounds the BPM (beats per minute) from the background music with internally generated pulses. We assume that music acts as a positive distraction since it is generally considered fun and "time flies when you are having fun".

Acknowledgements

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General Introduction

In the present paper we are going to investigate the effects of background music on the subjective sensation of two fundamental resources, namely time and money. To be more specific, we are going to investigate whether music tempo and music intensity (from now on primarily referred to as music volume) influence waiting time perceptions and price perceptions. Music tempo and volume are often used as marketing instruments in retail environments primary to target a specific customer audience (Bruner, 1990). For instance, trendy and youthful stores often play loud and fast paced music to draw in young people while stores that sell business clothing would most likely play more quiet and slow-paced music to attract a slightly older public. We are not focusing on the potential of music to attract the 'right' public but more on its potential to alter time and money perception.

Waiting time and money evidently play a crucial role in the market place. For example, it is shown that consumer satisfaction in service-based economies heavily depends on wait time evaluations (Davis & Vollman, 1990; Giese & Cote, 2002). Interestingly, this influence of wait time evaluations on consumer satisfaction seems mostly determined by the perceived wait time rather than the actual wait time (Antonides et al., 2002 Katz, Larson, & Larson, 1991; Hui & Tse, 1996; Pruyn & Smidts, 1998). Therefore it is important to increase our understanding of the factors that specifically influence our perceptions of (waiting) time. With this knowledge in mind some studies have investigated the effect of waiting time fillers such as music on wait time perceptions (e.g. Katz et al., 1991; Pruyn & Smidts, 1998, Antonides et al., 2002; Guéguen and Jacob, 2002). For example, Antonides et al. (2002) exposed people waiting on the phone to three different waiting time conditions: with music, with queuing information, and with information about expected waiting time. They found that music had a significant positive effect on consumers' perceptions of waiting times while the other two fillers were not significant. Music can be a critical component of the atmosphere in any store and also plays a role in the decision making process of purchases (Areniand Kim, 1993; Donovan and Rossiter, 1982). A familiar and enjoyable atmosphere will create more positive perceptions of prices and shopping time while in fact the actual shopping time and in-store prices did not change (Yalch and Spangenberg, 2000). By understanding the way consumers react to certain musical characteristics a personalized music strategy can be developed that supports the store or brand. The Antonides et al. (2002) research did however not specify the exact musical characteristics of the music used in the research. We could ask ourselves what exactly it is about music that leads to higher levels of wait time evaluations. Music is composed of multiple time-, pitch- and texture related variables (Downling and Harwood, 1986) and its precise meaning and effect is known to vary from person to person (Morris and Boone, 1998). This research will focus on two objective informational musical characteristics that are easily measurable and adjustable, namely musical tempo and volume.

The structure of the paper is as follows. First, we review literature suggesting that music tempo increases time perception and that music volume lowers time and price perception. Second, we present a field study conducted to test our prediction. Finally, we provide more insight into why music tempo and volume affect time and price perception and we conclude by giving a personalized optimal music suggestion for the bakery in which the research was conducted based on our findings.

1 The effects of music on the perception of time and price

Music is not a generic sonic mass, but rather a complex chemistry of controllable elements (Bruner II, 1990). It can vary along various dimensions including timbre (also referred to as the texture of the music, which incorporates volume), rhythm (the pattern of accents given to notes) and tempo (the speed or rate at which the rhythm progresses expressed in beats per minute). This paper will focus on two most easily controllable of the three dimensions mentioned above: the tempo of the music and the volume of the music. These two dimensions will be the two variables of this research.

1.1 The effect of music tempo and volume on the perception of time

The musical tempo can be defined as a variable allowing precise, comparative, quantifiable measurement by using a metronome to monitor the number of beats per minute or BPM (Oakes, 2003). The effect of music (tempo) on consumer's in-store behaviour has been extensively investigated. For instance, Milliman (1982) investigated the effect of music tempo on time spent shopping in a supermarket. He found that the tempo of the background music (73 BPM vs. 93 BPM) had a significant positive effect on the flow of customers in the store. Moreover, music tempo had a positive effect on the store's turnover (a 38% increase in gross sales). Ironically, few studies have looked at the effects of music's temporal aspects on customer time perception (Kellaris, 2008). Moreover, the findings of those studies are mixed. While some studies found that music tempo increased time estimates (Ornstein, 1969; Zakay, Nitzan, & Glicksohn, 1983; Fraisse, 1984; Oakes, 2003), other studies observed no relationship between these variables (Chebat, Gelinas-Chebat & Filiatrault, 1993; Hui, Dube, and Chebat 1997; North, Hargreaves, &

Heath, 1998; Caldwell & Hibbert, 2002). For instance, Oakes (2003) asked participants to estimate wait times (for student registration) while they were either exposed to slow-paced music or to fast-paced music. Results showed that there was a significant positive effect between temporal perception and musical tempo, meaning that participants in the slow-tempo music condition estimated the waiting time to be shorter compared to participants in the fast-paced music condition. Zakay, Nitzan and Glicksohn (1983) further found a relationship between tempo and time perception while performing different verbal tasks. They reported the longest time estimates when a fast tempo was played and vice versa. They also found that time estimates under the condition where no music was played were intermediate (see also paragraph 1.3). Heath (1998) found that the tempo of the music played in a gym had no significant effect on the perceived duration. Caldwell and Hibbert (2002) conducted research into the effect of music tempo and musical preference on consumer behaviour in a restaurant. Their results showed that musical preference was a better predictor of actual time spent dining than tempo although neither variable had a significant effect on perceived time.

We believe that there might be two reasons that could explain the discrepancy in the literature on the effect of music tempo on time duration. First, it might be a consequence of the fact that different musical genres such as jazz, classical music, or pop music were used among the different studies. For example, Oakes used obscure jazz/funk compositions and even an own composition to ensure that the music would be unfamiliar to the majority of subjects while Guéguen and Jacob (2002) used a typical instrumental on-hold tune that had been previously selected because of the fact that it scored well with respondents. Moreover, also within the specific papers, there were many confounds in the manipulation of music tempo. To be more specific, most of these studies have not purely manipulated the tempo of the music (by using digital music technology). Instead they typically used musical genres such as jazz for the slow tempo music condition and more funky music for the high tempo music condition. To manipulate tempo in an un-confounded manner, we especially composed two new songs of the same genre (classical) by means of digital music technology (see also paragraph 2.3). Second, we believe that attention to the background music might be an important moderator of the effect of tempo on time perception. That is, we predict that consumers' retrospective time perception only changes when they actually paid attention to the tempo of the background music. In previous literature attention to environmental stimuli (i.e. the background music) might have been higher in a boring waiting line context (Oakes, 2004) than in a context where simultaneously other interesting or distracting activities were being performed (for example in a restaurant; Caldwell & Hibbert, 2002 or gym; Heath, 1998). To explain the moderating role of attention we rely on findings of Wittmann and Paulus (2008). These authors suggested a pacemaker-accumulator model of time perception. This model dominated the past 50 years on time perception (for a review: Wittmann, 2003). In this model a pacemaker produces a series of pulses that are then fed into an accumulator. The number of pulses that has been registered by the accumulator during a given time span is used to produce estimations of experienced duration. An overestimation of interval duration will occur when there is an increased accumulation of temporal units over a certain time span. Conversely, a decrease in accumulation of temporal units will lead to an underestimation. It is important to note that the time pulses emitted by the pacemaker are accumulated only when attention is being directed to the pulses, in this case the beats per minute (see figure 1). According to the authors there are two mechanisms that could increase the number of pulses in an assumed accumulator. A first mechanism is increase attention to (as opposed to distraction from) the time. When waiting in line at a grocery store you will pay more close attention to the passage of time than when your mind is preoccupied by for example performing a physical exercise in the gym (cfr. Heath, 2008). More attention to the passage of time will increase the number of pulses that are being fed into the accumulator leading to longer time estimates. A Second mechanism is an increased rate of pulses emitted by the pacemaker due to arousal. The arousal mechanism to elongate time perception is also consistent with Berlyne's arousal hypothesis (1971), which states that the preference for a certain stimulus is related to the arousal potential of that particular stimulus. He defined highly arousing music as: loud, erratic, difficult to predict, and characterized by a quick tempo. While music with low arousal qualities is defined as: soft, monotonous, very predictable, and characterized by a slow tempo (Berlyne, 1971). Following this research we could thus assume that fast paced music will generally be more arousing resulting in a higher rate of pulses from the pacemaker and will thus lead to longer time estimates. Imagine for example the excitement/arousal in a discotheque in which only low-tempo music is being played compared to a discotheque in which high-tempo music is being played. However, another possibility could be that the accumulator mistakenly assumes that the BPM originating from the background music are in fact pulses emitted by the pacemaker. If this would be the case, we expect that this mistake will only happen when people paid attention to the background BPM.

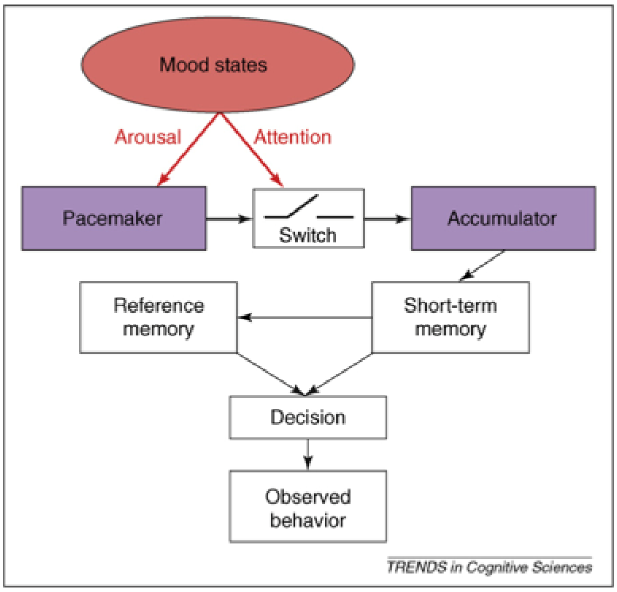


Figure 1: Wittmann's cognitive model of time perception: a pacemaker produces a series of pulses that are fed into an accumulator. The number

of pulses recorded represents experienced duration. The pulse number is compared with stored representations of time periods. (Source: Wittmann and Paulus (2008), TRENDS in Cognitive Sciences)

Some other research is also in line with the hypothesis that fast-paced music elongates time perception, at least when attention is given to the pace. For example, Kellaris and Mantel (2003) found that when participants were able to reconstruct the event from memory, perceived duration estimates of a past event were longer. The more information recalled from a time interval, the longer the retrospective duration estimate that will be attributed to that time interval (Block, 1990; Fraisse, 1984; Ornstein, 1969). When waiting in line, fast-paced music will more likely be noticed (and thus accumulated) than slow paced music and will therefore have a higher chance of being recalled (see also figure 1). Our hypothesis is also in line with the notion that retrospective duration estimates are formed by a weighted average of 'snapshots' of the actual affective experience (Fredrickson and Kahneman, 1993). A fast-paced song will usually provide more 'snapshots' and thus create a higher weighted average. Also the results of Kellaris and Kent (1991) that individuals generally think that the length of a fast-paced song is longer than the length of a slow-paced song of the same duration are in line with our prediction. That is to say, the authors explain this by stating that in a fast-paced song it seems as if more things are happening at the same time. The simple heuristic 'the more things have happened, the longer it must have taken' that people often use may help explain why people estimate the length of fast-paced songs to be longer. Taken together, the arguments listed above lead us to the following hypothesis.

Hypothesis 1.1*: "Respondents that were exposed to fast-paced music while waiting in line will have longer perceived waiting time estimates than respondents who were exposed to slow-paced music.*

We predict that attention to the background music is an important moderator of the effect of music tempo on time perception. We will assume that, when the music is noticed, an overload of sensory pulses in the accumulator will cause it to mix up the BPM-pulses it receives with the pulses it receives from the pacemaker and attribute those (partially) as pacemaker pulses to the accumulator. This allows us to make two additional predictions. First, we could predict that if respondents fail to notice the music (i.e., no attention to the music is being given) no effect of tempo on time perception will be observed.

Hypothesis 1.2*: "Respondents that were exposed to fast-paced music while waiting in line will have longer perceived waiting time estimates than respondents who were exposed to slow-paced music. This effect will not be observed when respondents fail to notice the music."*

Second, we could go one step further and predict that music volume also has an effect on perceived waiting time estimates. Music volume was mentioned by Bruner II as one of the three factors that define music along with rhythm and tempo making it an important musical stimulus property. It is a basic characteristic of all forms of music and, more importantly, marketers can easily control it. Research that investigates the effect of music volume on consumer sensations is limited. Kellaris and Altsech (1992) found high-volume music (compared to low-volume music) music to generate longer time estimates with female listeners. This was attributed to a greater hearing sensitivity of females and the fact that for high-volume music listeners are exposed to a higher amount of sensory information. Note that this explanation has a high parallel with the Wittmann and Paulus (2008) findings regarding musical tempo mentioned in the previous paragraph. Following the findings of Kellaris and Altsech (1992) we will expect loudness to contribute positively to waiting time perceptions since high-volume (versus low-volume) music confronts the accumulator with more sensory information (Kellaris and Altsech, 1992). Dowling and Harwood (1986) already stated that louder music evokes higher levels of attention and will thus increase the chance of recalling the waiting time period. Similarly, we will state that louder music will increase the chance of it being noticed by customers leading to higher levels of attention to the BPM or musical pulses. Customer's waiting time perceptions will subsequently be affected similarly to the previous paragraph. These findings together with the findings that led us to the previous hypothesis lead us to predict the following:

Hypothesis 1.3: *"Respondents that were exposed to fast-paced music while waiting in line will have longer perceived waiting time estimates than respondents who were exposed to slow-paced music. This effect will be more pronounced in the high volume (vs. low volume) condition."*

1.2 The effect of music tempo and volume on the perception of prices

Even though the amount of literature investigating the effect of music on customer price perceptions is rather limited, some studies have already investigated the effect of music tempo on the subjective value of money in service environment settings such as restaurants and cafeterias (Milliman, 1986; Caldwell and Hibbert, 1999). For instance, Milliman (1986) found that the tempo of the background music played in a restaurant had no effect on the amount of money spend on food, but there was however a significant difference in the amount of money spent on drinks. Groups that had their dinner while slow-paced music was playing in the background spent 40% more on drinks than groups that listened to fast-paced music while having their dinner. According to Milliman, this increase in spending was due to the fact that people who were dining with fast-paced background music spent less time at their tables than people who were dining with slow-paced background music. This made them less likely to place additional orders of drinks after their dinner. Similar findings were reported by other authors (Robaley et al., 1985; Caldwell and Hibbert, 1999; Guéguen et al., 2007; Down, 2009) suggesting that time spent mediates the effect of music tempo on consumer spending. Unfortunately, the studies mentioned above did not investigate whether or not the music that was being played affected people's price perception. That is, if all people were to stay in the restaurant for exactly half an hour it might have been the case that the people in one particular group (i.e. one particular type of background music) choose more expensive meals from the menu, which might indicate that their price perceptions have been lowered by the background music. This research will try to remedy this constraint and investigate whether or not price perception is affected by the background music. Note that the context of the current research is however different from a restaurant context or a supermarket context as was the case in the studies outlined above. Therefore we do not expect to have a significant relationship between the tempo of the background music and the subjective price estimation of the customers.

Very little research has been done specifically investigating the effect of musical volume on consumer price perceptions. It is shown that musical volume is negatively related to shopping time (Milliman, 1982; Yalch and Spangenberg, 1990). When the background music is too loud customers are more likely to spend less time in the store. Interestingly, studies in grocery stores have shown that this does not adversely influence the amount of purchases despite less time being spent in the store (Milliman 1982). Music that is too quiet is also negatively perceived so it is clear that an appropriate use of music volume is important. Similarly to the previous paragraph it would be wrong to generalize findings of a grocery store context to a waiting line context. When waiting in line, customers are forced to wait their turn and are thus unable to reduce their waiting time even if they would want to.

Music in an unpleasant context such as a waiting line context can work as a positive distraction. Research by Stein et al. (1996) found that the presence of a stimulus in one modality (e.g., an auditory stimulus) can amplify the signal of another modality (e.g., a visual or a price stimulus) and thus might possibly alter people's judgments. They exposed participants to a combination of an auditory stimulus together with a spatially located LED light (the visual stimulus) in the participant's field of vision and discovered that the visual stimulus was perceived as being more intense when accompanied by an auditory stimulus. Interestingly Stein et al. (1996) also found that the higher the intensity of the visual stimulus grew, the smaller the enhancing effect of the auditory stimulus became. When we generalize these findings we could apply them to the research at hand and state that by selecting the right auditory stimulus and its appropriate intensity (or volume) we might be able to alter the signal (or perception) of more rudimentary cues such as price perception and waiting time perception. We will not try to amplify the perceptions, but instead will try to depress them because prices and waiting time are obviously perceived as more negative the higher they get. The music or auditory stimulus in this case acts as a positive distraction taking customers' mind of the less pleasant stimuli prices and waiting time. Research by Debajyoti and Upali (2011) conducted on children waiting in a hospital supports the findings of Stein et al. (1996) and found that positive distractions such as music can affect the stress and anxiety associated with the waiting experience. Similar to this finding we will hypothesize that, the higher the music volume the more likely customers will be (positively) distracted by it, making them less sensitive to prices. As already stated by Milliman (1982) it is important for the music volume not to be too loud as well as for the music tempo not to be too high. Following this positive distraction hypothesis we will hypothesize that in the case of a low volume up-tempo music will be more distracting and thus lead to lower price estimates, whereas low-tempo music will be less distracting and thus lead to higher price estimates. In the case of a high volume however we do not expect the same effect. A high volume will be distracting as it is, regardless of the tempo of the music. However, a high volume combined together with a high tempo might lead to an overstimulation that will make customers nervous, agitated and more susceptible for stimuli (such as price and wait stimuli). Following this overstimulation hypothesis we will say that in the case of a high volume, a high tempo will have an adverse effect on customer price perception. This leads us to the following hypothesis.

Hypothesis 2: *"When the tempo of the music is low, the volume of the background music will lower perceived prices. When the tempo of the music is high, the volume of the background music will heighten perceived prices.*

1.3 The effect of mere exposure to music on waiting time and price perception

The effect of mere exposure to music has been extensively investigated. The mere exposure effect of music is essentially the difference between on the one hand not being exposed to music at all and being able to hear the music while being exposed to it on the other hand. The point at which a sound that was unnoticeable becomes noticeable is called the threshold point. The threshold point has been defined by Ana Oliveira (2002) as the lowest intensity of a stimulus (in this case music) that can be registered on a sensory channel by the receptor (in this case our ears). Guéguen and Jacob (2002) investigated time perceptions of people that had to wait on-hold on the phone with the on-hold message either accompanied by music or not. Their results showed that, compared to the control condition with no music, the presence of music leads to an underestimation of time spent. A possible explanation for this could lay in the fact that music is considered "fun", and it is commonly known that "time flies when you are having fun" (see also paragraph 4.2). Therefore, the conditions with music will render shorter waiting time perceptions than the baseline condition (i.e. the no music condition). Research by Zakay, Nitzan, & Glicksohn (1983) however did not find the same results. They performed a research in which they tested respondents' time estimations after they performed tests of different difficulties while being exposed to music of different tempos. The longest time estimates were found when a fast tempo was played and vice versa. Zakay et al. (1983) also performed the same tests when there was no music playing in the background. They found the time estimates under the condition where no music was being played to be intermediate.

As already mentioned before, an additional argument is based on the simple concept of distraction (Stein et al., 1996; Wittmann and Paulus, 2008). When the human brain is distracted by music, it is less likely to notice the things around him in detail, including the passage of time (and the price level). Since the brain has a limited input capacity, people are less likely to notice other (in this case negative) things when it is already occupied. We therefore state that: the higher the volume of the music, the bigger the likelihood that customer will be distracted by the music and thus the less outspoken will be the waiting time estimates and price estimates. These findings together with the findings of Stein et al. (1996) mentioned in the previous paragraph lead us to the following hypothesis.

Hypothesis 3*: "When music is being played, customers' waiting time and price perceptions will be lower compared to when no music is being played.*

2 Method section

2.1 Design

A 2-factor analysis of variance was performed on the factors tempo (low-tempo and up-tempo) and volume (low-volume, high-volume) and one additional condition (no music) to check whether the hypotheses mentioned above are true. A bakery served as the context of the study. The music was played through the bakery's own sound system which had two speaker already installed directly above the waiting line.

2.2 Participants

Two hundred and fifty-four customers were asked to participate in the research after having waited in line in a bakery. One hundred and fifty-two respondents agreed to participate in the research. Seventy-two subjects were male and eighty-one subjects were female. The average age of the respondents was forty-six years and ten months. Two respondents were later removed prior to the analysis because they lied about the fact that they heard music (see also paragraph 3.1).

2.3 Stimuli

The independent variables volume and tempo can be controlled by selection the appropriate decibel (dB) level and beats per minute (BPM), respectively. The decibel level within the bakery can easily be adjusted by turning up to volume of the sound system used in the bakery. It is however critical that the appropriate decibel levels are used in order to differentiate between the low volume condition and the high volume condition. The decibel scale runs from the faintest sound the human ear can detect, which is labeled 0 dB, to over 180 dB, the noise at a rocket pad during launch. A typical conversation will usually be around 60 dB. The sound of the bread slicer in the bakery was situated around 85 dB. Note that decibels are measured logarithmically, meaning that each increase of 20 decibel units will make the intensity multiply times 10. Taking into account the acoustic of the bakery itself, the amount of noise the customers and employees made, and the noise from the bread slicer, a volume level of 70 dB was used as the high volume condition and a volume level of 62 dB was used as the low volume condition. The high volume music was considered easily hearable, but not too loud. The low volume music was considered hearable, but required additional focus and attention in order to listen attentively.

In order to reduce the confounding effects of musical style and musical preference two songs were composed specifically for this research. By using the music software program Logic Pro 9.1 the number of beats per minute (tempo) of the song could easily be adjusted. This resulted in a slow-paced song and a fast-paced song that are completely alike in terms of tonality (both G major), melody, instruments used and genre. The only difference between both songs is the number of beats per minute. The fast-paced song has 120 beats per minute while the slow-paced song has 85 beats per minute. Both songs are not on the opposite sides of the spectrum. Very slow ballads can have a tempo of lower than 50 BPM while very fast songs can go over 200 BPM. Both songs can be listened to via the hyperlinks in appendix 2. We deliberately choose not to differ too much in terms of BPM because we wanted to prevent the tempo from disturbing the customers and maintain a tempo that is commonly used on the radio and in waiting line contexts.

2.4 Dependent variables

When leaving the bakery, we asked participants whether they were willing to answer a couple of questions. If they agreed, we first asked them to evaluate on a 9-point Likert scale the perceived waiting time (i.e. "How long do you think you had to wait in line today?", 1 to 9, very short/very long) and the perceived price perception (i.e. "How do you perceive the price level of your bill?", 1 to 9, very low/very high). Additionally, we asked them to estimate the number of minutes they thought they had to wait in line. After the first day of data collection, in which people were interviewed under the high-volume condition, we decided to incorporate an additional question regarding the actual price they had to pay. Participants in the low-volume conditions and control condition were thus also asked to indicate roughly the price they just paid for their purchases. As a manipulation check, participants also had to indicated whether or not they noticed that music was being played while they were waiting in line. Finally, some demographic variables (i.e., age and gender) were recorded.

For a more detailed look at the questionnaire we refer to appendix 1. The interviews were conducted orally, but during the interview the respondents were able to look at the questionnaire to make it more comprehensible. The original questionnaire was in Dutch, but was later translated to English for this research (see appendix 1).

2.5 Data collection method

The data used in this research was collected by means of verbal interviews in 'Bakkerij Verlooy', a bakery situated in the city of Geel, Belgium. The study was conducted in 6 shifts over three consecutive Sunday mornings in the month of March 2014. Data was only collected on Sunday morning in order to ensure similar conditions (same number of staff and approximately same number of customers) and in order to be relatively certain to have a constant length of the waiting line (busiest time of the week). Two one-hour shifts were carried out each day, one shift from approximately 08.30 a.m. to 9.30 a.m. and one shift from approximately 10.00 a.m. to 11.00 a.m. The experimental conditions for the first 5 shifts were randomly chosen. A sixth shift was used to acquire additional data that was needed for the up-tempo, low volume condition. It was made sure that customers were only interviewed if they had been exposed to the music during their entire waiting time. A video camera recorded the exact time of customers entering the bakery and the time of being interviewed upon leaving the bakery. The difference in time between those two events was considered the effective waiting time. Customers that had already participated in one of the previous weeks were not allowed to participate a second time. The prices and number of people working behind the counter was held constant throughout the entire research.

3 Results

3.1 Outliers

Two respondents who claimed to have heard music in the baseline condition while in fact no music was being played were removed from the research.

3.2 Manipulation checks

We first tested whether more people noticed the background music in the high-volume condition and in the high-tempo condition. Results revealed that in the high-volume 47 out of 63 respondents (74.6%) noticed the music compared to the low-volume condition in which 29 out of 61 respondents (47.5%) noticed the music. When comparing the high- and low-tempo condition we saw that in the high-tempo condition 36 out of 63 respondents (57.1%) noticed the music while in the low-tempo condition 40 out of 61 respondents (65.5%) noticed the music.

We then tested whether the (timing of the) session(s) had an effect on the effective wait time and effective price. Results showed that being interviewed in the early session (08.30 a.m. to 9.30 a.m.) or in the late session (10.00 a.m. to 11.00 a.m.) had no significant effect on the effective waiting time ($p = 0.989$) nor had it a significant effect on the effective price ($p = 0.655$).

3.3 Hypothesis testing

Hypothesis 1.1 We first tested whether music tempo had a significant effect on waiting time perceptions. A univariate (high-tempo/low-tempo music/baseline) ANOVA revealed a significant main effect of musical tempo ($F(2, 146) = 5.780$; $p = 0.004$; see Table 1). That is to say, a Post

Hoc Tukey test revealed that wait time estimates were significantly lower in the low-tempo condition (M = 470,164; SE = 38.487) than in the baseline condition (M = 686.40; SE = 60.119; p = 0.008) or the high-tempo condition (M = 610.000; SE=37.872; p = 0.028). The wait time estimates in the baseline condition were not significantly different from the wait time estimates in the high-tempo condition (p = 0.531). These findings support hypothesis 1.1 by showing that wait estimates are higher in the High-Tempo condition as compared to the Low-Tempo condition. However, the wait estimates in the baseline condition are higher than in the low-tempo condition, even though the BPM equals 0 in the baseline condition (see Figure 2). We discuss this latter finding in the general conclusion.

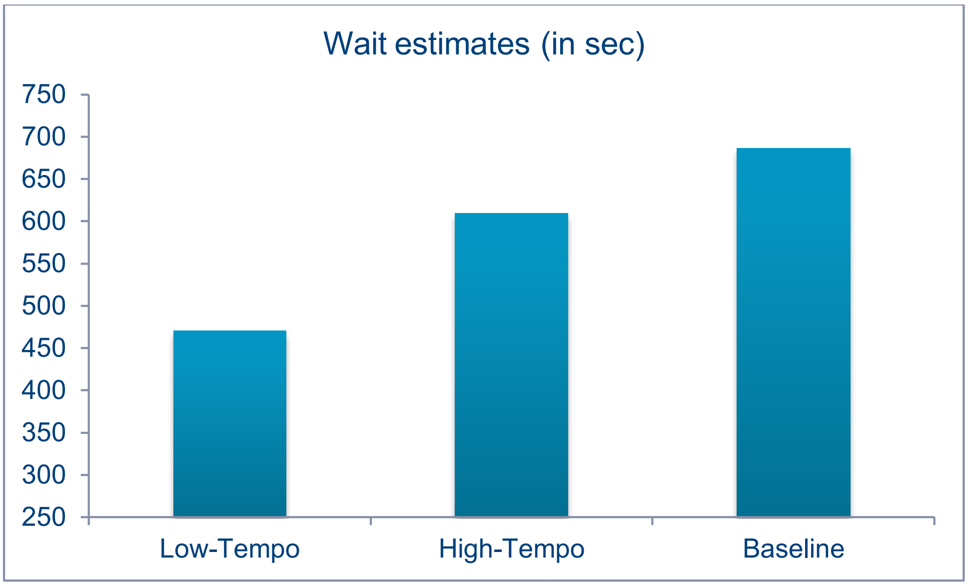


Figure 2: Y-axis: estimated wait time (in sec), X-axis: tempo conditions (baseline = no music played)

Hypothesis 1.2 We then tested whether the effect of music tempo on waiting time estimates is moderated by noticing that music was being played. A 2 (high-tempo/low-tempo music/baseline) X 2 (noticing/not-noticing background music) + 1 (baseline: no music) ANOVA revealed a significant main effect of musical tempo ($F(2,144) = 3.847$; $p = 0.024$), no significant main effect of noticing ($F(1,144) = 0.006$; $p = 0.941$) and a significant interaction effect between tempo and whether or not the respondents noticed the music (F (1,144) = 3.996; p = 0.047) (see Table 2). This finding supports hypothesis 1.2. That is, the positive relationship between musical tempo and wait time estimates will not be observed for respondent that did not notice the music (see Figure 3).

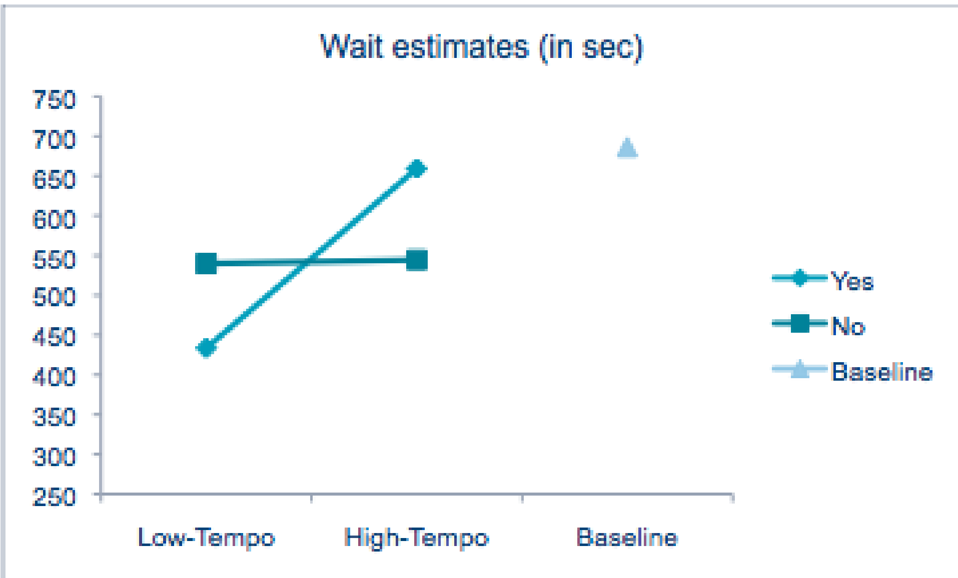


Figure 3: Y-axis: estimated wait time (in sec). X-axis: tempo conditions. Separate lines: 'Yes' = noticed that music was being played, 'no'= not noticed that music was being played, 'Baseline' = no music played.

Hypothesis 1.3 Third, we tested whether the effect of music tempo on waiting time perceptions is moderated by the volume of the background music. A 2 (high-tempo/low-tempo music) X 2 (high volume/low volume music) + 1 (baseline: no music) ANOVA revealed a significant main effect of musical tempo (F(1,144) = 7.20; p = 0.008) on the wait time estimation of customers as well as a significant main effect of musical volume (F(1,144) = 13.254; p = 0.000). Contrary to our hypothesis, the interaction-effect between tempo and volume was however not significant (F(1,144) = 0.044; p = 0.833; see Figure 4 and Table 3).

A post-hoc test revealed that wait time estimates were significantly lower in the high volume music condition (M = 446.90; SE = 36.49) than in the baseline condition (M = 686.40; SE = 57.92; p = 0.002) or the low volume condition (M = 636.32; SE = 37.09; p=0.001; see Table 4). The wait time estimates in the baseline condition were not significantly different from the wait time estimates in the low volume condition (p = 0.756; see Table 4). The post-hoc tests for tempo are similar to the ones outlined above (see hypothesis 1.1). Given that there was no significant interaction effect of noticing music by volume we conclude that hypothesis 1.3 is not supported by the data.

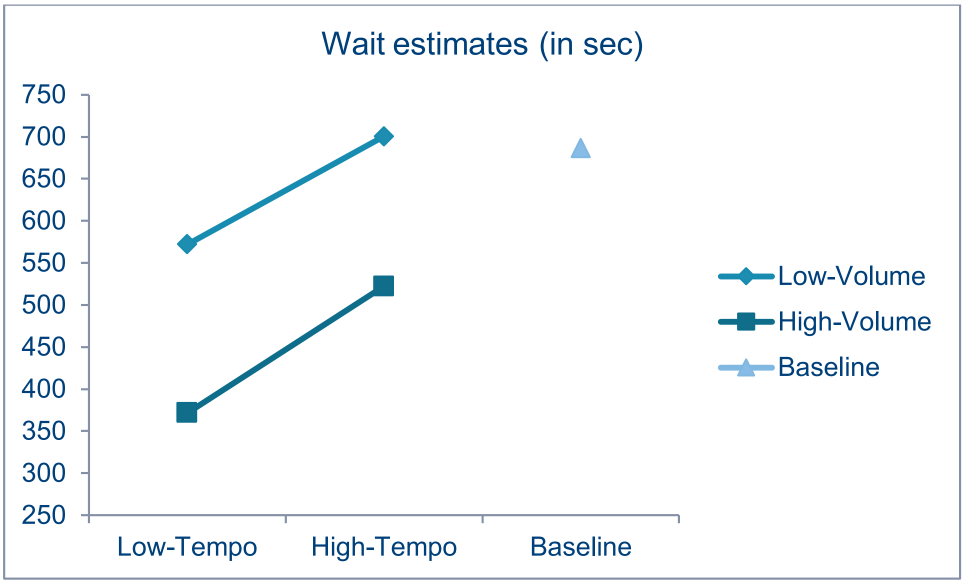


Figure 4: Y-axis: estimated wait time (in sec). X-axis: tempo conditions. Separate lines: Volume conditions

Additional analyses for hypothesis 1.2 and 1.3 The same set of analyses was also performed for the dependent variable "wait" (i.e., a 9-point Likert scale varying form "very short" to "very long") instead of the subjective wait estimates. First we analyzed the effect of music tempo and whether or not the respondents noticed the music on the dependent variable "wait". Again a 2 (high-tempo/low-tempo music) X 2 (noticing/not-noticing background music) + 1 (baseline: no music) ANOVA was performed and revealed a significant main effect of musical tempo ($F(2,144) = 4.289$; $p = 0.016$), no significant main effect of noticing ($F(1,144) = 1.084$; $p = 0.299$) and a highly significant interaction effect between tempo and whether or not the respondents noticed the music (F

(1,144) = 8.518; p = 0.004) (see Table 7). Note that these results are very similar to the ones we found for hypothesis 1.2. That is, the positive relationship between musical tempo and perceived waiting time will not be observed for respondent that did not notice the music. The post-hoc Tukey test also revealed results similar to the ones we found for hypothesis 1.2 (for more info, see Table 7).

Additionally, we tested the effect of musical volume and tempo on the dependent variable “wait”. The ANOVA results showed a significant main effect of volume (F(1,144) = 16.045; p = 0.000) and a marginally significant main effect of tempo (F(1,144) = 3.050; p = 0.083). There was no significant interaction effect of tempo by volume (F(1,144) = 1.610; p = 0.206; see Table 5). A Tukey test further revealed that the subjective wait was significantly higher in the baseline condition (M = 5.760; SE = 0.306) than in the low-tempo condition (M = 4.209; SE = 0.196, p =0.000), or the high-tempo condition (M=4.689, SE=0.193,p = 0.009; see Table 6 and Figure 5). The subjective wait estimates in the low-tempo condition were not significantly different from the wait time estimates in the high-tempo condition (p = 0.184; see Table 6). The post-hoc Tukey test also revealed that the subjective wait estimates were significantly lower in the high volume music condition (M = 3.898; SE = 0.193) than in the baseline condition (M = 5.760; SE = 0.306; p = 0.000) or the low volume condition (M = 4.999; SE = 0.106; p = 0.000; see Table 6). This confirms the first part of hypothesis 3 stating that customers’ subjective wait time estimates are high when no music is being played. The subjective wait estimates in the baseline condition were marginally significantly different from the estimates in the low volume condition (p = 0.095; see Table 6). For subjective price estimates we did not find a significant difference between the music conditions and the no music condition (see Figure 6).

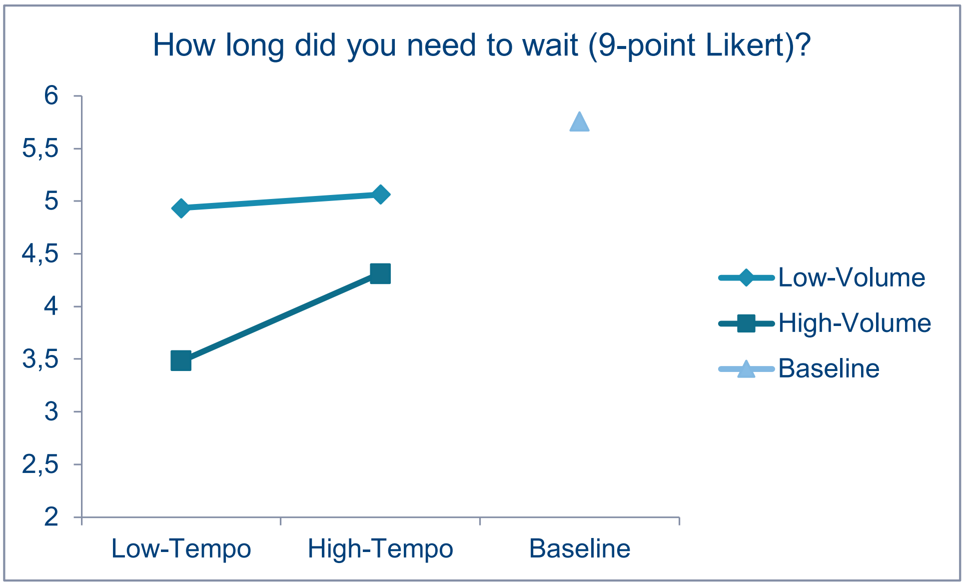


Figure 5: Y-axis: "How long did you need to wait? (9: very long)" X-axis: tempo conditions. Separate lines: Volume conditions.

Hypothesis 2 We further tested whether price estimates are lowest in the two intermediate-stimulating conditions (i.e., low-tempo/high volume and high-tempo/low volume). Note that the subjective Price estimates of the respondents were measured on a 9-point Likert scale ranging from very low (1) to very high (9). A 2 (high-tempo/low-tempo music) X 2 (high volume/low volume music) + 1 (no music) ANOVA revealed no significant main effects of tempo ($F(1,144) = 0.353$; $p = 0.553$) and volume ($F(1,144) = 0.800$; $p = 0.373$) on subjective price estimates. There was however a marginally significant interaction effect between tempo and volume on the subjective price estimates of respondents ($F(1,144) = 3.433$; $p = 0.066$; see Table 8 and Figure 6).

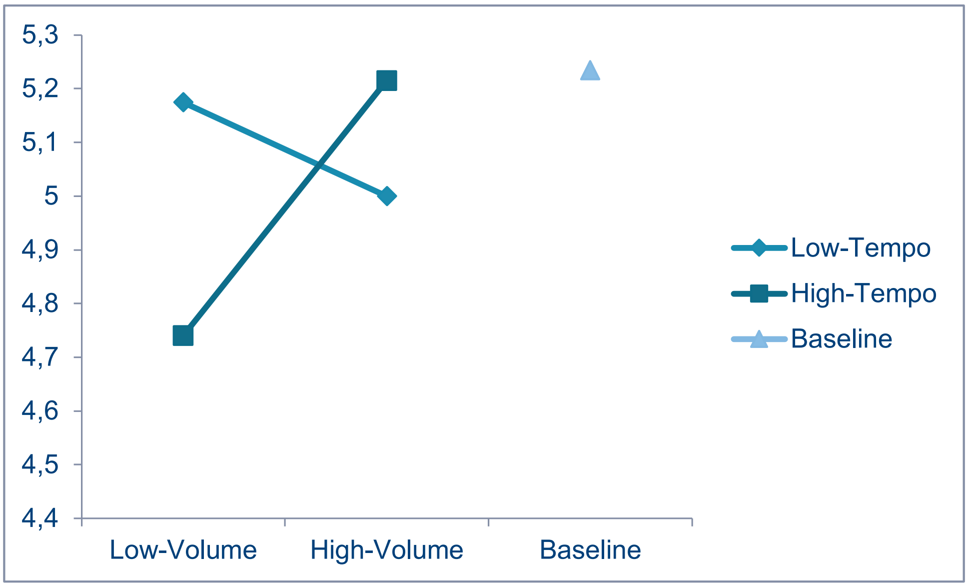


Figure 6: Y-axis: price perception on 9-point Likert scale (9: very expensive). X-axis: volume conditions. Separate lines: Tempo conditions

Further analysis showed that this interaction effect could be quantified into two marginally significant contrast effects. First, there was a marginally significant contrast effect between the low-volume/high-tempo condition and the low-volume/low-tempo condition ($p = 0.091$; see Table 9). This means that it might be better for retailers to opt for up-tempo music when they prefer the volume of the background music to be low. Second, the price perception seemed to differ between the low-volume/high-tempo condition and the high-volume/high-tempo condition ($p = 0.054$; Table 10). The squared line (High-Tempo) in Figure 6 graphically indicates this interaction effect.

Age and gender The demographic variables age and gender had no significant effects on our results.

4 Discussion

4.1 Summary of the main findings

The present research demonstrated that music tempo and music volume significantly influence customer wait time and price perceptions. For marketers it is essential to identify which combination of music volume and music tempo is optimal in order to adequately support the specific retail environment.

We found that waiting time perceptions are higher when the tempo of the background music is high rather than low (see hypothesis 1.1). We further showed that this effect is only observed when the background music was noticed (see hypothesis 1.2). Hypothesis 1.3 however was not in line with our observations. We assumed respondents exposed to fast-paced music would have longer perceived waiting time estimates than respondents exposed to slow-paced music (hypothesis 1.1) and expected that this effect would increase as the volume increased. What we found was that volume had a main effect on waiting time estimates. When the background music was louder, the respondents perceived their wait to be shorter.

Concerning price perceptions, we showed that prices were perceived as lower in the intermediate stimulation conditions. That is to say, price perceptions were lowest in the low-tempo/high-volume and in the high-tempo/low-volume condition (see hypothesis 2).

Hypothesis 3 was confirmed for respondents' subjective wait estimates but not for their subjective price estimates.

4.2 Discussion of the findings

Our findings are thus in line with hypothesis 1.1; wait estimates are higher when the tempo of the background music is high compared to when the tempo of the background music is low. These results are consistent with the first stream of research mentioned in paragraph 1.1, which found that

music tempo increased time estimates. The implications of this finding are extremely relevant for marketers as they imply that customer satisfaction could be improved by simply decreasing the tempo of the background music.
However, we observed that for the baseline condition, which is in fact the condition where the tempo (and volume) of the music is minimal or zero, the subjective wait time estimates are significantly higher than those in the low-tempo condition (see figure 2). This suggests that it might be better to play any tempo of music than to play no music at all. Following the research outlined in paragraph 1.3, we could explain this by the notion that music typically elicits positive affective responses (i.e., “music is fun”, Kellaris, 2008, p. 842) and that “time flies when you’re having fun” (Kellaris and Kent, 1992). Therefore, conditions with music will generally be considered shorter than conditions without music. Yet, these findings are not consistent with the study of Zakay, Nitzan, & Glicksohn (1983) (see also paragraph 1.3) who found that wait time estimates in the no music condition were intermediate. A possible explanation for the inconsistency might be a difference in fit between the type of background music and the context of the task. That is to say, music will not always be considered “fun”. Some people might like to listen to pounding techno music when they go out to a club and after having a few beers, but they probably would not considered that same music to be “fun” when they are waiting in line at the bakery the next morning. Other research supports this stating that when there is no good fit between the music and the specific context reactions to the exact same music can vary significantly (MacInnis and Park, 1991; North MacKenzie, Law, & Hargreaves, 2004). To summarize this in only a few words: “No fit, no fun”. We believe that the “fit” in the current study might have been higher than the fit in the study of Zakay et al. (1983). They did not choose the music used in their research based on its contextual fit, but mainly focussed on the effect of music in general on respondent’s awareness of the environment while performing difficult tasks that required cognitive processing.

Consistent with hypothesis 1.2 we further found that the effect of tempo on wait estimates was only significant for people who noticed the music (see figure 3). Interestingly, we observed that people in the baseline condition report higher wait time estimates than people who failed to notice the music. This finding seems to indicate that people are subconsciously influenced by the background music. A parallel might be drawn between subliminal advertising where marketers attempt to visually get certain messages across to people without them even realizing it. This subliminal influence would be in line with the idea that music affects our basal affective system, which is intuitive and reflexive by nature and thus does not need conscious mediation (Kahneman, 2011).

The significant main effect of volume we found on the subjective wait estimates of respondents was also in line with our expectation based on the findings of Wittmann and Paulus (2008). We found that the wait estimates were lower (i.e. more positive; see Figure 6) for the high-volume condition than for the low-volume condition. A higher volume can more easily divert attention away from the unpleasant waiting line context and instead make customers focus on the music (or "fun") than would a low volume.

We also investigated the effect of music tempo and volume on customer's price perceptions. We found that there was a marginally significant interaction effect between tempo and volume on price perception. Further analysis confirmed hypothesis 2 implying that for low-tempo music the volume of the background music would lower perceived prices (negative relationship). Contrary to high-tempo music where the volume of the background music would heighten perceived prices (positive relationship) (see also Figure 7). Results indicated that the low-volume/high-tempo condition renders the lowest price perceptions. A possible explanation might be that a lower volume will not be noticed under a low-tempo. When the tempo is high, it more easily attracts attention allowing the pacemaker signals to be registered by the accumulator (cfr. Wittmann and Paulus, 2008; see also Figure 1) and thus making it work as a positive distraction (cfr. Debajyoti and Upali, 2011). And as we already stated before: “time flies when you are having fun”. Similarly, in the low-tempo/high-volume condition we could say that only when the music volume is high, attention is drawn and an effect on customer price perception can take place. We have to keep in mind that is very important for the music volume not to be too high or too low (cfr. Milliman, 1982). The fact that the high-tempo/high-volume condition does not follow the above mentioned reasoning might be due to the fact that an overstimulation takes place, making people purposely trying to divert their attention away from the music The fact that there was no significant main effect of tempo and of volume on subjective price estimates was not surprising. The studies mentioned in the literature review that found significant effects of music on prices or price perceptions did this in a restaurant context (Robaley et al., 1985; Caldwell and Hibbert, 1999; Guéguen et al., 2007; Down, 2009). The context of the current study is completely different. In a restaurant you tend to order more (drinks) when you stay in the restaurant for a longer period of time whereas this is not the case for a waiting line context in a bakery (i.e., customers are obligated to wait in line for their turn). The product bought in bakery will not be consumed in-store but instead at home. Additionally, the amount of products bought is often premeditated and will most likely not be affected when having to wait in line a little longer.

4.3 Limitations

A possible shortcoming of this research is the fact that only one particular song has been used throughout each of the conditions (repeated). Further research is needed to confirm if these findings would still hold for another song or a complete playlist that meets the same tempo and volume conditions.

The data collection of the current research was performed over six sessions. For the third session (high-tempo/low-volume) however the actual average wait time was considerably higher than in the other five session (see table 11) while the number of people working behind the counter was the exact same on each of the three days, indicating that more people visited the bakery the morning of the third session. There is no clear reason as to why exactly this was the case since there was no special occasion on that particular day or on the two other days. We therefore turned to the owner of the bakery and asked him if he had an explanation why certain mornings were busier than others. He stated that it might have been due to the fact that the weather was bad that morning. When the weather is bad people tend to stay indoors and thus consume more pastries. This explanation is plausible since the total average waiting time on that particular day (session 3 and 4, respectively the high-tempo/low-volume condition and the low-tempo/low-volume condition; see table 11) was higher than it was the other two days. Also on day 3 (session 5 and 6), a bright and sunny day, we saw that the total average waiting time was lower, which is in line with this explanation.

After the first day of data collection (i.e. session 1: low-tempo/high-volume and session 2: high-tempo/high-volume) we decided to incorporate an additional question. For the subsequent days and sessions respondents were also asked to give an approximation of the price they just had to pay. Since session 1 and 2 formed the only two sessions with a high volume we were unable to compare the effective prices over the different volume conditions but instead only for the low volume and baseline condition.

Another important limitation of this research is the fact that there was a second and separate counter in the bakery itself for people who had pre-ordered. That way, impatient customers who know what they want to order in advance are able to avoid waiting in line. As a result, the respondents of this research will more likely not include as many impatient regular clients as in a normal population (since they would probably pre-order). This could have potentially altered the results. Additional research is warranted in stores that do not have a pre-order counter to see whether the results of this research would still hold.

Due to some practical issues, the effective waiting time of a respondent for this research was considered to be the time in between the moment the respondent entered the store and the moment that respondent left the store. The effective waiting time thus includes the time being served by the store's staff. Since large orders obviously take more time to fulfill than small orders this might have distorted the results. For this reason we were unable to compare the waiting time estimates of customers with their exact waiting times. A research with two cameras (one pointing at the door and one pointing at the counter) would have been preferable.

The interviews were conducted in-store. Therefore, the respondents were still exposed to the background music making it easier for them to 'recall' the fact that music was being played. The question remains whether or not as many people would have claimed to have noticed the music if the interview would have been conducted outside the store where they would not have been able to hear the music anymore.

Lastly, we would like to state that music is very person-specific. Some respondents stated that the music used in this research irritated them and that they would prefer no music at all, whereas other explicitly stated that they enjoyed the music. Recent research at the University of Barcelona discovered that some people 'suffer' from musical anhedonia, implying that they are biologically incapable of registering any emotional response to music. These people show no response in heart rate or any other physiological indicator of emotion when exposed to music. Josep Marco-Pollarés, author of the study, even stated that it would not be surprising to find people who respond to one genre and do not respond to another. This recent finding leads us to question the universality of the statement "music is fun" and might also imply that there are other factors in music than just its arousal potential (Wittman and Paulus, 2008) that could have an effect on the pacemaker (see Figure 1) and thus on consumer waiting time perceptions. Additional research with people suffering from musical anhedonia is needed to confirm this suspicion.

4.4 General conclusion

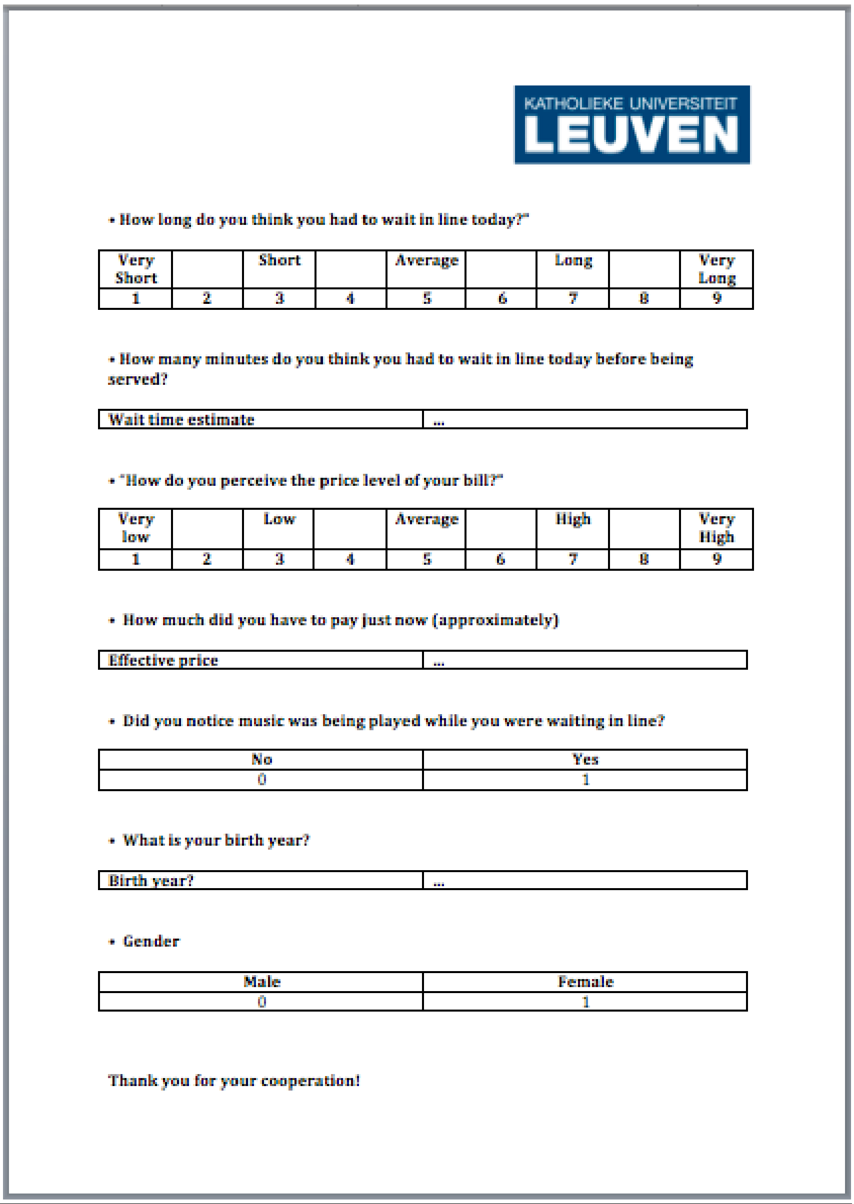
Additional research is required in order to make generalizations of the findings of this paper. We can however formulate an optimal combination of music tempo and volume specifically for Bakery Verlooy, the bakery in which we conducted the research. Based on the findings of this research we would give the following advice:

Playing music in the store is better than playing no music at all. In terms of tempo, Bakery Verlooy should definitely go for a low-tempo type of music since low-tempo music gives lower waiting time estimates than high-tempo music and lower waiting time estimates than no music. In terms of volume, a high volume is preferable since a high volume produced better subjective wait evaluations and increases the chance of people noticing the music, which also has a positive effect on subjective wait estimates (given the fact we are using low-tempo music).

Since Bakery Verlooy profiles itself as a high-quality bakery, customer satisfaction (and thus positive waiting time perception) is very important. Price perceptions are of lesser importance. The customers know that they will have to pay a little bit more at Bakery Verlooy, but they are willing to pay more for a better product and a better service and are thus less price sensitive than the typical clientele of a bakery.

Appendices

Appendix 1: Questionnaire



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• How long do you think you had to wait in line today?"

Very Short		Short		Average		Long		Very Long
1	2	3	4	5	6	7	8	9

• How many minutes do you think you had to wait in line today before being served?

Wait time estimate	...

• "How do you perceive the price level of your bill?"

Very low		Low		Average		High		Very High
1	2	3	4	5	6	7	8	9

• How much did you have to pay just now (approximately)

Effective price	...

• Did you notice music was being played while you were waiting in line?

No	Yes
0	1

• What is your birth year?

Birth year?	...

• Gender

Male	Female
0	1

Thank you for your cooperation!

Appendix 2: Songs (via Youtube)

Low-Tempo song: http://youtu.be/Qes52Q0XA8E

High-Tempo song: http://youtu.be/J0Khaj1RFfE

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Tables

Table 1

Tests of Between-Subjects Effects

Dependent Variable: Wait est. sec

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1044602,149[a]	2	522301,075	5,780	,004
Intercept	43183908,543	1	43183908,543	477,920	,000
Tempo	1044602,149	2	522301,075	5,780	,004
Error	13192274,361	146	90358,044		
Total	61897500,000	149			
Corrected Total	14236876,510	148			

a. R Squared = ,073 (Adjusted R Squared = ,061)

Table 2

Tests of Between-Subjects Effects

Dependent Variable: Wait est. sec

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1403848,84[a]	4	350962,211	3,938	,005
Intercept	47372805,96	1	47372805,96	531,572	,000
Tempo	685663,153	2	342831,577	3,847	,024
Music	491,909	1	491,909	,006	,941
Tempo * Music	356093,256	1	356093,256	3,996	,047
Error	12833027,67	144	89118,248		
Total	61897500,00	149			
Corrected Total	14236876,51	148			

a. R Squared = ,099 (Adjusted R Squared = ,074)

Table 3

Tests of Between-Subjects Effects

Dependent Variable: Wait est. sec

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2158267,18[a]	4	539566,796	6,433	,000
Intercept	45622678,79	1	45622678,79	543,909	,000
Tempo	603903,935	1	603903,935	7,200	,008
Volume	1111726,944	1	1111726,944	13,254	,000
Tempo * Volume	3725,036	1	3725,036	,044	,833
Error	12078609,33	144	83879,231		
Total	61897500,00	149			
Corrected Total	14236876,51	148			

a. R Squared = ,152 (Adjusted R Squared = ,128)

Estimated Marginal Means

Tempo * Volume

Dependent Variable: Wait est. sec

Tempo	Volume	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
,0	,0	572,000	52,877	467,485	676,515
	1,0	371,613	52,017	268,797	474,429
	3,0	.[a]	.	.	.
1,0	,0	700,645	52,017	597,829	803,461
	1,0	522,187	51,198	420,991	623,384
	3,0	.[a]	.	.	.
3,0	,0	.[a]	.	.	.
	1,0	.[a]	.	.	.
	3,0	686,400	57,924	571,909	800,891

a. This level combination of factors is not observed, thus the corresponding population marginal mean is not estimable.

Table 4

Estimated Marginal Means

1. Tempo

Dependent Variable: Wait est. sec

Tempo	Mean	Std. Error	95% Confidence Interval Lower Bound	Upper Bound
,0	471,806[a]	37,087	398,501	545,112
1,0	611,416[a]	36,493	539,285	683,548
3,0	686,400[a]	57,924	571,909	800,891

a. Based on modified population marginal mean.

2. Volume

Dependent Variable: Wait est. sec

Volume	Mean	Std. Error	95% Confidence Interval Lower Bound	Upper Bound
,0	636,323[a]	37,087	563,018	709,628
1,0	446,900[a]	36,493	374,769	519,032
3,0	686,400[a]	57,924	571,909	800,891

a. Based on modified population marginal mean.

Post Hoc Tests

Tempo

Multiple Comparisons

Dependent Variable: Wait est. sec
Tukey HSD

(I) Tempo	(J) Tempo	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
,0	1,0	-139,836*	52,0239	,022	-263,039	-16,633
	3,0	-216,236*	68,7767	,006	-379,113	-53,359
1,0	,0	139,836*	52,0239	,022	16,633	263,039
	3,0	-76,400	68,4586	,506	-238,524	85,724
3,0	,0	216,236*	68,7767	,006	53,359	379,113
	1,0	76,400	68,4586	,506	-85,724	238,524

Based on observed means.
The error term is Mean Square(Error) = 83879,231.

*. The mean difference is significant at the ,05 level.

Volume

Multiple Comparisons

Dependent Variable: Wait est. sec
Tukey HSD

(I) Volume	(J) Volume	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
,0	1,0	189,282*	52,0239	,001	66,079	312,485
	3,0	-49,023	68,7767	,756	-211,900	113,854
1,0	,0	-189,282*	52,0239	,001	-312,485	-66,079
	3,0	-238,305*	68,4586	,002	-400,428	-76,181
3,0	,0	49,023	68,7767	,756	-113,854	211,900
	1,0	238,305*	68,4586	,002	76,181	400,428

Based on observed means.
The error term is Mean Square(Error) = 83879,231.

*. The mean difference is significant at the ,05 level.

Table 5

Tests of Between-Subjects Effects

Dependent Variable: Wait

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	84,307[a]	4	21,077	9,008	,000
Intercept	3124,106	1	3124,106	1335,268	,000
Tempo	7,136	1	7,136	3,050	,083
Volume	37,541	1	37,541	16,045	,000
Tempo * Volume	3,768	1	3,768	1,610	,206
Error	336,915	144	2,340		
Total	3663,000	149			
Corrected Total	421,221	148			

a. R Squared = ,200 (Adjusted R Squared = ,178)

Table 6

Estimated Marginal Means

1. Tempo

Dependent Variable: Wait

Tempo	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
,0	4,209[a]	,196	3,821	4,596
1,0	4,689[a]	,193	4,308	5,069
3,0	5,760[a]	,306	5,155	6,365

a. Based on modified population marginal mean.

2. Volume

Dependent Variable: Wait

Volume	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
,0	4,999[a]	,196	4,612	5,386
1,0	3,898[a]	,193	3,517	4,279
3,0	5,760[a]	,306	5,155	6,365

a. Based on modified population marginal mean.

Post Hoc Tests

Tempo

Multiple Comparisons

Dependent Variable: Wait
Tukey HSD

(I) Tempo	(J) Tempo	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
,0	1,0	-,486	,2748	,184	-1,137	,165
	3,0	-1,563*	,3632	,000	-2,424	-,703
1,0	,0	,486	,2748	,184	-,165	1,137
	3,0	-1,077*	,3616	,009	-1,934	-,221
3,0	,0	1,563*	,3632	,000	,703	2,424
	1,0	1,077*	,3616	,009	,221	1,934

Based on observed means.
The error term is Mean Square(Error) = 2,340.

*. The mean difference is significant at the ,05 level.

Volume

Multiple Comparisons

Dependent Variable: Wait
Tukey HSD

(I) Volume	(J) Volume	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
,0	1,0	1,095*	,2748	,000	,445	1,746
	3,0	-,760	,3632	,095	-1,620	,100
1,0	,0	-1,095*	,2748	,000	-1,746	-,445
	3,0	-1,855*	,3616	,000	-2,711	-,999
3,0	,0	,760	,3632	,095	-,100	1,620
	1,0	1,855*	,3616	,000	,999	2,711

Based on observed means.
The error term is Mean Square(Error) = 2,340.
*. The mean difference is significant at the ,05 level.

Table 7

Tests of Between-Subjects Effects

Dependent Variable: Wait

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	66,263a	4	16,566	6,720	,000
Intercept	3238,644	1	3238,644	1313,856	,000
Tempo	21,144	2	10,572	4,289	,016
Music	2,673	1	2,673	1,084	,299
Tempo * Music	20,996	1	20,996	8,518	,004
Error	354,959	144	2,465		
Total	3663,000	149			
Corrected Total	421,221	148			

a. R Squared = ,157 (Adjusted R Squared = ,134)

2. Tempo

Dependent Variable: Wait

Tempo	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
,0	4,376	,212	3,958	4,794
1,0	4,644	,200	4,248	5,039
3,0	5,760a	,314	5,139	6,381

a. Based on modified population marginal mean.

3. Music?

Dependent Variable: Wait

Music?	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
,0	5,028	,185	4,662	5,393
1,0	4,358a	,180	4,002	4,715

a. Based on modified population marginal mean.

Post Hoc Tests
Tempo

Multiple Comparisons

Dependent Variable: Wait
Tukey HSD

(I) Tempo	(J) Tempo	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
,0	1,0	-,486	,2820	,200	-1,154	,182
	3,0	-1,563*	,3728	,000	-2,446	-,680
1,0	,0	,486	,2820	,200	-,182	1,154
	3,0	-1,077*	,3711	,012	-1,956	-,199
3,0	,0	1,563*	,3728	,000	,680	2,446
	1,0	1,077*	,3711	,012	,199	1,956

Based on observed means.
The error term is Mean Square(Error) = 2,465.
*. The mean difference is significant at the ,05 level.

Table 8

Tests of Between-Subjects Effects

Dependent Variable: Price

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5,198[a]	4	1,299	1,395	,239
Intercept	3467,537	1	3467,537	3722,672	,000
Tempo	,329	1	,329	,353	,553
Volume	,745	1	,745	,800	,373
Tempo * Volume	3,207	1	3,207	3,443	,066
Error	134,131	144	,931		
Total	3965,000	149			
Corrected Total	139,329	148			

a. R Squared = ,037 (Adjusted R Squared = ,011)

Table 9

Custom Hypothesis Tests #9

Contrast Results (K Matrix)[a]

Contrast			Dependent Variable Price
L1	Contrast Estimate		-,425
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-,425
	Std. Error		,249
	Sig.		,091
	95% Confidence Interval for Difference	Lower Bound	-,918
		Upper Bound	,069

a. Based on the user-specified contrast coefficients (L') matrix: punt2vspunt 4

Test Results

Dependent Variable: Price

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	2,750	1	2,750	2,906	,091
Error	113,571	120	,946		

Table 10

Custom Hypothesis Tests #10

Contrast Results (K Matrix)[a]

Contrast			Dependent Variable Price
L1	Contrast Estimate		-,477
	Hypothesized Value		0
	Difference (Estimate - Hypothesized)		-,477
	Std. Error		,245
	Sig.		,054
	95% Confidence Interval for Difference	Lower Bound	-,962
		Upper Bound	,009

a. Based on the user-specified contrast coefficients (L') matrix: punt3vspunt 4

Test Results

Dependent Variable: Price

Source	Sum of Squares	df	Mean Square	F	Sig.
Contrast	3,580	1	3,580	3,783	,054
Error	113,571	120	,946		

Table 11

Descriptive Statistics

Dependent Variable: Wait in sec.

Session Nr	Mean	Std. Deviation	N
1,0	560,774	171,3522	31
2,0	689,656	227,8261	32
3,0	1139,250	132,4344	16
4,0	600,633	91,2108	30
5,0	446,067	247,1213	15
6,0	768,680	279,3458	25
Total	681,933	269,4605	149

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