# The effect of tempo of background music on duration of stay and spending in a bar 

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| Tiivistelmä - Abstract |  |
| Music and consumer behaviour has become an increasingly important area of social psychology <br> recently, thanks in part to a developing interest from businesses in the various effects of music on <br> spending, brand attitude and perception of duration. Many of the studies in the field have focused <br> largely upon retail environments and restaurants, with relatively few concerning themselves with cafés <br> and bars. |  |
| In this study, the tempo of background music in a bar was manipulated through the selection of <br> playlists, and the amount of time and money spent by customers in the bar was measured, in order to <br> determine whether the tempo of the background music had any effect upon duration of stay and <br> spending. Two conditions were used, fast tempo and slow tempo. The experiment was conducted by <br> observing how long customers spent in the bar, and by collecting sales data from the cash register <br> system of the bar, during five three-hour observation periods for each condition. To account for weekly <br> shifts, the sales during each hour of the observation period (16:00-19:00 on each day) were calculated as a <br> percentage of the day's total sales. Sales data were also collected for the ten weeks surrounding the <br> observation period and averaged in order to give a control set of data. |  |
| It was found that while the tempo of the music had no significant effect upon the time spent in the venue <br> by customers, a significant difference was found for sales - a higher percentage of sales were recorded <br> while slower tempo music was playing than faster tempo music. These results support previous <br> research, and suggested explanations for the findings can also be found from those studies. |  |

Asiasanat - Keywords
Music and consumer behaviour, Tempo, Background music, Spending, Duration of stay
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## TABLE OF CONTENTS

1 INTRODUCTION ..... 1
1.1 Introduction to music and consumer behaviour ..... 1
1.2 Rationale of the research ..... 2
1.3 Research questions ..... 4
2 LITERATURE REVIEW: BACKGROUND AND EXPECTATIONS ..... 5
2.1 Previous research in music and consumer behaviour. ..... 5
2.2 'Fit' and brand relationships ..... 8
2.3 Tempo and other key terms ..... 10
2.4 Perception of tempo and duration ..... 11
2.5 Theoretical considerations for this study ..... 13
3 RESEARCH METHODS ..... 17
3.1 Method ..... 17
3.2 Experiment design ..... 18
3.2.1 Data collection ..... 18
3.2.2 Selection of playlists ..... 21
3.2.3 Error avoidance ..... 22
3.3 Data analysis ..... 23
3.3.1 Duration ..... 23
3.3.2 Sales ..... 23
3.3.3 Overcoming issues ..... 24
4 RESULTS ..... 30
4.1 Duration data ..... 30
4.2 Sales data ..... 32
5 CONCLUSIONS ..... 36
5.1 Conclusion and discussion ..... 36
5.2 Limitations of the study ..... 38
5.3 Recommendations for further study ..... 40
6 REFERENCES ..... 42
APPENDICES ..... 46
Appendix A: Playlists used in the experiment ..... 47
Appendix B: Full duration data ..... 51
Appendix C: Full sales data ..... 52
TABLE OF FIGURES
FIGURE 1: Sales during the slow condition ..... 26
FIGURE 2: Sales during the fast condition ..... 27
FIGURE 3: Mean sales for the control condition ..... 27
FIGURE 4: Sales in the week beginning 29th December, 2008 ..... 28
FIGURE 5: Sales in the week beginning 5th January, 2009 ..... 29
FIGURE 6: Frequency of occurrence of different durations in each condition ..... 31
FIGURE 7: Mean percentage of daily sales in each condition, with error bars ..... 34

## 1 INTRODUCTION

### 1.1 Introduction to music and consumer behaviour

Music and consumer behaviour, as it is most commonly known, is an area of study that has received increasing attention in recent years largely due to a realisation of the influence music can have over people, both consciously and unconsciously, and its potential benefits for business. The term was popularised by Hargreaves and North in their book The Social Psychology of Music (1997) and the field is mainly concerned with how the activity of customers in commercial settings is affected by the presence of music, various types of music or particular elements of music. However, there has also been quite some emphasis upon the emotional responses of consumers - for instance how they feel about their shopping experience or how they feel music they have heard in a store allows them to identify with that store, and as such a more appropriate title for this field of study could be 'consumer response to music'.

A growing number of studies have been conducted into how consumers react to music in places of commerce, variously focusing on the setting itself and different aspects of the music, as well as the kinds of reactions produced (including emotional and affective responses of participants, how long they remained in the environments and how much money they spent, amongst others). The kinds of results produced by these studies have mainly supported the use of music in
businesses where people come to spend money, and various assertions have been made about which genres, tempos and volumes (e.g. Smith \& Curnow, 1966, Milliman, 1982, 1986, Wilson, 2003) are most beneficial depending whether the desired effect is to increase spending (Herrington, 1996) or increase the amount of time the consumer spends in the store (Yalch \& Spangenberg, 2000, Herrington, 1996), as well as how a positive relationship between the customer and the brand can be reinforced through music (Beverland et al, 2006, DeNora \& Belcher, 2000, Spangenberg et al, 2005).

### 1.2 Rationale of the research

Although they have taken a wide variety of approaches, the vast majority of previous studies conducted so far have been focusing mainly upon retail environments, such as high street shops and grocery stores (North, Hargreaves and Shilcock, 2003). The aim of this study was to address this perceived gap, by focusing upon the effect of tempo upon the duration of time spent by customers in a bar that also serves as a cafeteria for some customers during the day. In this study, tempo is measured based upon beats per minute (BPM), as in Milliman (1982, 1986).

This study attempted to discover whether the tempo of background music in a bar affects the amount of time spent by customers in that environment, as well as
exploring how their spending is affected. A bar is a novel setting for this research when compared to the more traditionally studied environments like shops and restaurants, in the sense that customers there can easily prolong an enjoyable experience by repeating their activity - in this case by buying another drink.

In a shop, customers come with a task already in mind, which is to either buy a number of pre-decided items or to look around and see if there is anything they want to buy. Either way, their time in the shop will be restricted by this task. Similarly, customers in a restaurant have a pre-determined intention - to eat a meal - and they normally have an expectation of how long it will take them to fulfil that intention. Milliman (1986) identifies that people will not normally eat more than they originally intended, but they are more likely to drink more, as this is seen as more acceptable. Being based only on spending on drinks, the present study was free from restrictions caused by a perceived lack of acceptability in ordering more food than originally anticipated, as faced by Milliman (1986). In terms of duration of stay, even customers who are enjoying their time spent in a restaurant may feel that they should move on when they have finished their meal, as the restaurant staff may want to clear the table for the next customer. There is no such hurry in a bar. Furthermore, cafés and bars have rarely been used as environments for these kinds of studies, and when they have it has generally been in the context of how the rate of consumption of beverages, rather than the spending or duration of stay, has been affected by tempo (Hargreaves \& North,
1997) and volume (Guéguen et al, 2008) of the background music.

### 1.3 Research questions

The main aim of this study was to answer two specific questions:

1. Does the tempo of background music affect the amount of time customers spend in the bar during one visit?
2. Does the tempo of background music affect the sales volume in a bar?

Two further questions were also considered during the investigation:
3. Through what mechanisms does the tempo of the background music affect the amount of time and money spent by customers in the bar?
4. Is there a connection between spending and duration of stay as affected by the tempo of the background music?

These questions were addressed through a combination of observation of customers, data from the cash takings of the bar during the experiment and the surrounding period, and reference to literature that suggested possible explanations for any effect found.

## 2 LITERATURE REVIEW: BACKGROUND AND EXPECTATIONS <br> 2.1 Previous research in music and consumer behaviour

As already mentioned, studies measuring consumer reactions to various musical features in commercial settings have taken various approaches. The independent variables in these studies have generally been the characteristics of the music itself, but studies have also addressed presence versus absence of background music and familiarity and liking of the music amongst participants. Dependent variables measured have been spending, duration of stay (perceived and actual), enjoyment of the shopping experience, preference for the shopping environment, and how consumers have felt the music they hear fits with the image of the environment in which they hear it. Some of the more relevant studies in this field are described in this section.

Music has a long documented capacity to affect consumers' attitudes and behaviour when considering items on offer, and this is exploited regularly in advertising and other commercial applications. A fundamental model that is applicable here is classical conditioning. In the context of music and consumer behaviour, this is the idea that a piece of music can be used for example in an advertisement, and associated with a particular product to 'condition' the consumer into feeling the same way about the product as they do about the music. In this way, it may be possible for instance to advertise a product with a piece of
music that is popular amongst the product's target audience. Gorn's (1982) study, where participants were given the option to choose between different coloured pens that were associated with a liked piece of music or a disliked piece, is a simple example of this, although there is some criticism of this and other studies, borne out by various failures to repeat the findings in similar classical conditioning experiments (North \& Hargreaves, 2008).

When considering commercial environments such as shops and restaurants, studies have found quite clear evidence that various attributes of the music can produce a range of behavioural responses. For example, Smith and Curnow (1966) found that louder music caused shoppers to shop more quickly, and Milliman $(1982,1986)$ observed in studies in shops and restaurants that when slow-tempo music was played, "in-store traffic flow was significantly slower" (Milliman, 1982, p.89) and diners took longer over their meals in restaurants, at the same time spending more money on drinks. According to another restaurant study by Wilson (2003) about how different musical genres affect purchase intentions and judgements of atmosphere, jazz, classical and popular music were found to be more likely to produce higher spending than easy listening or no music. This was backed up by North, Shilcock and Hargreaves (2003), who found that classical music increased spending in a restaurant. In another study that discovered musical genre can also affect purchase intentions in a café, classical music increased the amount customers said they would be willing to pay for particular
products by $20.5 \%$ compared to no music, and it was found that both classical and popular music may have increased actual sales (North and Hargreaves, 1998). Meanwhile, Jacob (2006) found that drinking songs played in a bar would increase duration of stay and spending, further demonstrating the effect of music upon consumption behaviour.

Studies have generally agreed that consumers' spending of time and money as well as their affective responses are positively affected by music as opposed to no music. Furthermore, in a meta-analysis study that gathered the findings of 32 studies, Garlin and Owen (2005) found that spending also increased with familiarity and liking, and with classical music as opposed to other genres. They also found that preference and familiarity with the music (which were considered jointly) increased spending and duration of stay (Garlin \& Owen, 2005). However, Yalch and Spangenberg (2000) had previously found that while familiarity was associated with an increase in perceived duration of stay, there was a decrease in actual duration, which suggests that forming generalisations about how music affects consumers can be risky. The reason suggested for the above finding was that increased arousal during familiar pieces increased the speed with which shoppers conducted their activities. (Yalch \& Spangenberg, 2000). In a study on the effects of background music on supermarket shoppers, Herrington (1996) found that both duration of stay and spending of shoppers in the store were affected by musical preference, but unlike other studies, tempo and volume of the music were
not found to have any significant effect.

## $2.2{ }^{\prime}$ Fit' and brand relationships

Another relevant area of study is how well music 'fits' in a commercial environment, and how this affects consumers. Fit in the field of music and consumer behaviour is the notion that music can be appropriate to its commercial context. Fit is normally examined in terms of music in advertisements and music in retail environments and restaurants, and is described in terms of how well the music 'fits' with the product with which it is associated. The term was first used in this context by MacInnis and Park (1991) who originally studied fit in advertisements and concluded that music in an advertisement fits if the consumer perceives it to conform and be applicable to their idea of what the advertisement's main meaning is. The term has since been adopted by many researchers in the field. The main benefit of studying fit is to enable commercial entities to build relationships between their brands and their customers by using music that consumers associate with the brand and that they personally identify with positively. This creates a positive relationship between the brand and the consumer, as the consumer sees the brand as having the same self-image as them. Findings from studies on fit in advertisements also suggest that music that fits with the central message of the advertisement increases attention towards and recall of the message (North \& Hargreaves, 2008).

As well as in advertising, fit has been studied in the arena of places of business, in terms of how in-store music affects consumers' appraisal of brands and atmosphere. For instance, Beverland et al (2006) conducted in-depth interviews with store customers to ascertain how music that does or does not fit well with their pre-existing image of the store affects their feelings about it. It was concluded that fit can be influential in giving new customers signals as to the quality and image of a shop, and also as to whether it is the kind of shop that they would normally visit. 'Misfit' was also found to be important - it can lead to a decline in the customer's affinity to a shop with which they had previously identified closely - but on the other hand, it can be a powerful tool for re-branding when a shop wants to change its image (Beverland et al, 2006).

DeNora \& Belcher (2000) conducted a study into how music can affect what they describe as 'agency' (in-store behaviour, purchase subjectivity and identity) with fashion retail stores. It was found that music is used in these stores to identify with the target clientèle, assert a brand image and to structure time (e.g. different music at different times of day or year) and in-store conduct. On the other hand, Dubé \& Morin (2001) discovered that background music does not have an exclusive effect on the customer's evaluation of the store - if the overall atmosphere or impression is negative then the music will not improve the customer's assessment.

Spangenberg et al (2005) looked at the joint effects of ambient scent and music on
consumers' evaluations of a store, its environment and items for sale during the Christmas season. The results showed that if customers feel that the music and scent are compatible with their overall impression of the store then their evaluation of the store will be favourable. However, as with Beverland et al (2006), if there is a 'mismatch' then there are likely to be negative results in this regard.

### 2.3 Tempo and other key terms

Having investigated how music can affect responses of consumers, it is important to establish the meaning of tempo, both generally and in the context of this study, and to define other key terms. In this study, background music was manipulated in order to look for a measurable change in the amount of time and money customers spent in a bar while music playlists with different tempi were playing.

Tempo is usually measured as beats per minute, or BPM - the beat being the most salient pulse. Tempo is defined by Caldwell and Hibbert (2002) as simply "the speed or rate at which the rhythm progresses" (p.897). Levitin (2006) elaborates that conceptually the tempo of a piece of music can be demonstrated by the speed at which movements to the piece (such as dancing or marching) might occur. In Milliman (1986), slow tempo music was rated as being 72 BPM or fewer, while fast tempo music was 94 BPM or more, as based on listening tests.

In the present study, duration of stay refers to the amount of time spent by one customer in the bar space. The number of minutes between sitting and standing to leave was timed for individual customers to give this measurement. Spending was measured during the observation periods based upon hourly sales figures taken from the bar, which are in Euros ( $€$ ).

### 2.4 Perception of tempo and duration

The way humans perceive tempo in music is based on beat perception, or "finding the downbeats in a metrical signal." (Eck et al, 2000, p.157). The more frequent the beats detected by the auditory system, the quicker the music's tempo is perceived to be. Humans are able to discriminate between different tempos from a very early age (Baruch \& Drake, 1997). In this sense, it is a largely subconscious process. Cross (1998) makes an important point that while the perception of attributes of music is often studied in the conscious realm (for example, beat detection is often analysed through tapping tests), it is important to remember that "perception of aspects of music can be, and often is, more or less involuntary or 'reflexive', and that it necessarily involves non-conscious processes" (Cross, 1998, p.4). Furthermore, the reactions elicited by variations in these aspects are often on a subconscious level, as demonstrated by many of the cases examined in 2.1 Previous research in music and consumer behaviour (see for example Smith \& Curnow, 1966, Garlin \& Owen, 2005).

Fraisse (1982) and Moelants (2002) have both found that listeners generally perceive music as falling between 100 and 140 BPM (in McKinney \& Moelants, 2006), which supports the idea of a preferred range of tempi for humans. For example, repetitive sounds may be grouped in such a way that our perception of tempo is affected (van Noorden and Moelants, 1999). As Eck, Gasser and Port (2000) worded it, "a listener will change the metrical interpretation of a piece...to keep the rate of the downbeat assignment in a comfortable range." (p.160). Drake \& Bertrand (2001, in Zatorre \& Peretz, 2001) suggest certain processes that appear to be universal in human temporal perception - among these are a tendency to group events into perceptual units, a preferred optimal rate at which temporal events are processed and a preference for simple time ratios.

North, Hargreaves and Heath (1998) suggest that as fast music contains more 'information' within a given amount of time, listening to fast music for a certain length of time should elicit a feeling of that time having lasted longer. However, their study of perceived duration of a visit to the gym found that the tempo of music did not affect the perception of duration either way, but interestingly, it was discovered that slow music produced more inaccuracy in estimations (North, Hargreaves and Heath, 1998). Oakes (2003) discovered that students waiting in a queue perceived the waiting time to be shorter in the presence, as opposed to the absence, of music. For short waits it was also found that with slow music, actual duration exceeded perceived duration (Oakes, 2003).

It seems however that effect of music on perception of duration may arise from more than just its tempo - Bailey (2006) found that subjects' estimates of duration while engaged in a task seemed to be affected by the number of songs played within a period of time - falling in line with Poynter's (1989) segmentation-change model of time perception, which suggests that retrospective estimation of the duration of a time period is derived from a division of that period into event-based segments alongside an assumption of the duration of each segment. In their aforementioned meta-study, Garlin and Owen (1996) discovered that tempo affected arousal more strongly than the other musical attributes they studied, and a study by Day et al (2008) found that participants made more accurate decisions in a task with faster-tempo background music.

### 2.5 Theoretical considerations for this study

Stroebele and Castro (2006) found that presence as opposed to absence of music during a meal increased calorie and fluid intake and the duration of the mealtime, however tempo and volume were found to have no effect. In a study by Guéguen et al (2008), background music with a higher volume increased alcohol consumption and speed of drinking. This was hypothesised to be partly due to increased arousal in the loud volume condition - tempo is another attribute of music that has been found to increase arousal (Garlin \& Owen, 1996), therefore it is possible that faster tempo music causes an increase in drink consumption and
drinking speed. However, another suggestion for the increase in consumption in Guéguen et al (2008) was that loud music may increase drinking due to reduced opportunities for social interaction, something that would not be affected by tempo.

Research into the effect of the tempo of background music upon perceived duration of stay have produced varied results, making it unclear whether an effect should be expected in the present study and if so, in what direction. Bailey's (2006) findings mentioned earlier suggest that the number of songs may have more effect upon perceived duration than tempo, which may lead to different tempo conditions having little effect on perceived duration. In the aforementioned study by North, Hargreaves and Heath (1998), tempo of music had no significant effect upon perceived duration in a gym, whereas Oakes (2003) found that slower tempo music reduced perceived duration for short waits in a queue. Furthermore, although many of the studies examined here have compared actual and perceived duration, they have not investigated whether a direct link exists between perceived duration and the amount of time spent in a certain place (i.e. whether a perception of time passing more slowly or quickly due to music affects duration of stay).

Berlyne (1971, cited in North \& Hargreaves, 2008) proposed that the louder or faster music is the more arousal it induces and therefore the quicker people will
conduct their activities. This suggestion was supported by an experiment on speed of eating and music tempo in which Roballey et al (1985) found that faster music led to more bites per minute in a student cafeteria, and McElrea and Standing (1992) backed up this finding in a drinking experiment where they found that participants drank faster in the presence of fast music. Berlyne's (1971) theory and these findings logically lead to the assumption that when the tempo of the background music in a bar is faster, customers will drink their drinks more quickly. Even if this assumption is correct however, it would be hard to make any assertions about whether that would cause spending to be higher through a quicker rate of consumption and replacement of beverages, or lower due to a quicker rate of consumption leading to an earlier departure. For this same reason, it is hard to base any prediction for duration of stay on this suggestion.

Caldwell and Hibbert (2002) found that slow tempo as opposed to fast tempo music significantly increased the amount of time spent by customers in a restaurant as well as spending on the meal. Milliman (1986) also found that customers in a restaurant took significantly longer to eat their meals (on average 56 minutes) in the slow tempo condition than in the fast tempo condition (45 minutes). In this research, slower music also produced higher spending on alcoholic beverages (Milliman, 1986). Multiple studies have found a link between duration of stay in a commercial environment and spending (e.g. Vida, Obadia \& Kunz, 2007, Caldwell \& Hibbert, 2002).

As discussed above, tempo has been shown to have an effect on the behaviour of restaurant, café and bar customers in previous research. Whether it is to do with arousal, perceived duration or other factors, it could be expected that the variations of tempo would have an influence on customers' condition and thus their behaviour, which could lead to them staying longer or leaving earlier, or spending more or less, than they otherwise would.

## 3 RESEARCH METHODS

### 3.1 Method

This study was conducted in the form of an unrelated field experiment with two distinct but related parts. The aim was to observe the effect of the independent variable, which was the tempo of the background music, upon the two dependent variables, which were the amount of time spent in the selected venue by customers and the sales income of the venue. Null hypotheses were formed for each dependent variable, and these were tested using the quantitative data collected during the observation period. Through observing the natural behaviour of customers without interfering with their activities directly, it was hoped that the findings would be ecologically valid and that any reactions observed to the controlled manipulations of the environment in which the observations were conducted (i.e. the tempo) would be authentic, and to some extent, generalisable.

The principle research questions addressed by this study were does the tempo of background music affect the amount of time customers spend in the bar during one visit? and does the tempo of background music affect the sales volume in a bar? The methodology selected was designed to answer these questions by seeking a relationship between music playlists identified prior to the experiment as having fast or slow tempi and the amounts of time and money that customers spent in the venue, while each of those playlists were used as background music. The null
hypothesis for duration was that the amount of time customers spent in the venue would not be affected by the tempo of the background music played during their visit, and for spending that the sales in the venue would not be affected by the tempo of the background music played during the observation periods.

As participants were not aware that they were being observed, it was important to ensure that the methodology used remained ethical at all times. To this end, individual characteristics of participants and their behaviour were neither scrutinised nor taken into account in the study, with the researcher posing as a normal customer of the venue, and the ethics of the methods used were discussed with a researcher at the University of Jyväskylä prior to the observation. Dunn (2009) suggests that if observation in field research is conducted innocuously and with no intervention, there is no need to inform participants of the research. There were other ethical considerations beyond those concerning the participants. It was important to the management staff of the venue in which the observations took place that for competitive reasons, the identity of the venue would not be revealed alongside sales figures, and accordingly, anonymity has been ensured.

### 3.2 Experiment design

### 3.2.1 Data collection

Observations took place during two conditions - fast tempo music and slow
tempo music. Observations were made over a period of five days for each of the two conditions, with three hours of observations on each day in the afternoon from 16:00-19:00 - one of the busier sales periods for the venue, which is a café / bar in the centre of Jyväskylä, Finland. The slow condition was in operation between Monday the $16^{\text {th }}$ and Friday the $20^{\text {th }}$ of February, 2009, and the fast condition between Monday the $2^{\text {nd }}$ and Friday the $6^{\text {th }}$ of March, 2009. The same three hour playlists were used throughout each of the two conditions, although the order was varied using the shuffle function of the venue's media player to avoid order effects. The volume at which the music was played was kept at the same level (the venue's usual level for that time of day) throughout all observations.

The aim of the study was to measure how long on average customers spent in the venue during the two different conditions. The whole venue was too big to observe at once, therefore a section was selected, in this case the smoking section. This choice was made for a few reasons - the smoking section is the largest section that is easy to view in its entirety, it is usually the most heavily populated, and most customers who smoke do not go to the smoking section to smoke and then leave to the other part of the restaurant, rather they come to the smoking section and sit there for the duration of their stay (as ascertained from a discussion with the venue's management).

The method used for the duration information was to observe how long each incoming customer occupied their seat within the observed area, from sitting down upon arrival to standing up to leave. This was done by making a note of the times of arrival and departure on a specially designed pro forma. There were various potential difficulties in measuring in this way, for example customers leaving their seats to visit the toilet, buying another drink, changing table or seat or leaving the smoking area after finishing a cigarette, any of which would have divided the duration into smaller parts that would be unrepresentative of the length of time actually spent in the venue by individual customers. These potential issues were overcome by various methods, such as memorising or making notes about customers' appearances in order to keep track of which customers had just arrived and which had returned from an errand. This was made easier by the fact that the observations were carried out during cold weather and therefore any arrival or departure would be marked by the removal or putting on of a winter jacket.

For spending data, hour-by-hour takings at the bar during the observation period were taken from the venue's computerised cash sales records. This data was not linked to individual customers, but because the same music was playing throughout the venue, a general spending trend was obtained for each of the two conditions. Data was also taken for the whole of each week during which observations were carried out, as well as every week from the $29^{\text {th }}$ December, 2008
to the $22^{\text {nd }}$ March, 2009. Some of the methodological choices outlined above were refined during two pilot studies, when the conditions were not altered but possible difficulties in data recording were identified and where necessary, corrected.

### 3.2.2 Selection of playlists

The venue has a database of 999 songs from which playlists are usually selected, either automatically and at random by the venue's media player, or manually by staff. The selection of songs is updated monthly by the venue, with some new songs being added and some old songs being removed from the available selection. The songs are bought from a specialist company that supplies music for commercial enterprises, according partly to the guidelines of the chain to which the venue belongs, and partly to the wishes of the venue's management. The selection of music consists of a range of popular chart music from the 1960s to the present day. The songs are stored with various details in the PC from which they are played, one of which is BPM. This information was used in creating the playlists for the observations.

Playlists for the two conditions were chosen from the venue's available selection based upon BPM and played through the venue's existing media player and sound system - the tempi of the tracks were not altered as in Herrington (1996), rather separate tracks were selected for each playlist based upon their existing tempi, as
in Milliman (1982, 1986). Although Herrington (1996) points out that musical features other than tempo can have a confounding effect, it was felt that this would be a more ecologically valid way of presenting the two conditions. Indeed, it was considered important to make as few alterations as possible to the normal atmosphere of the venue, in order to minimise the risk of finding an effect that may have been caused by confounding variables and attributing it to the tempo of the background music. The playlists used for each of the two conditions can be seen in Appendix A. The range of BPM for music in the slow condition was 34-60 BPM and in the fast condition it was 147-222 BPM. This falls well within the ranges identified as fast or slow in Milliman (1986) and mentioned in 2.3 Tempo and other key terms.

### 3.2.3 Error avoidance

In order to minimise the risk of making a Type I (false positive) error or attributing any effect found to confounding variables, a few precautions were taken:

- Times and dates of the experiment were carefully selected in order to avoid picking times when duration of stay or spending may have been affected differently by external factors (e.g. by pay-day, holidays, day of week, time of day etc.).
- Customers already present at the beginning of the observation or staying until after the end were not considered, as accurate results could not be obtained from them.
- Enough observations were made to ensure that any effects observed were a result of the conditions and not coincidence.
- Observation periods were at the same time each day and on the same days in each week to minimise the effects of timing.


### 3.3 Data analysis

### 3.3.1 Duration

All data analysis was done computationally using SPSS. The null hypothesis tested for the duration data was that the amount of time customers spent in the venue would not be affected by the tempo of the background music played during their visit. The duration data was analysed using a t-test, as a direct comparison was required between the mean time customers spent in the venue in the slow condition and that in the fast condition. The recorded figures were entered as the total number of minutes (as opposed to, for instance, hours:minutes).

### 3.3.2 Sales

The null hypothesis tested here was that the overall sales in the venue would not be affected by the tempo of the background music played during the observation periods. The hourly sales were obtained from the venue's cash register system and the sales figure for each individual hour between 16:00 and 19:00 (16:00-17:00, 17:00-18:00 and 18:00-19:00) on each day during the slow and fast weeks was
calculated as a percentage of that day's overall takings. The same calculation was also done for the 10 weeks surrounding the study (seven weeks beforehand, one week in between and two weeks afterwards) and the average calculated for each hour between 16:00 and 19:00, on each day of the week from Monday to Friday, in order to give an indication of what proportion of sales occur during that period in a normal week when the playlists are not manipulated; these figures were then used as control figures in the analysis. The percentage of daily sales was calculated to account for possible effects of higher overall sales in a given week (see 3.3.3 Overcoming issues). A one-way analysis of variance (ANOVA) was then conducted on the figures for the fast and the slow weeks, along with the 'control' figures. Two post-hoc tests were also conducted on the data - LSD and Bonferroni. Data from the Friday of each week were excluded from the analysis, along with some other selected data (see 3.3.3 Overcoming issues for an explanation of this).

### 3.3.3 Overcoming issues

During the analysis of the sales data, it became apparent that there were certain unanticipated issues that needed to be overcome before any usable results could be obtained. The first of these was that the sales in the week during which fast background music was used were higher than those in the slow week. When initially viewing the data, there seemed to be a strong effect of increased sales between 16:00-19:00 on Monday to Friday of the fast week, during which times
sales were $€ 2,355.28$, as compared to $€ 2,111.19$ in the slow week. However, when looking at the total sales figures for the week, the fast week saw sales of $€ 15,042.41$ between Monday to Friday, compared to $€ 10,557.86$ in the slow week. This demonstrates that the difference in sales figures between 16:00 and 19:00 was not necessarily caused by an effect of the tempo of the background music, but by the fact that sales at the venue were higher throughout that week. This issue was resolved by calculating the hourly sales between 16:00-17:00, 17:00-18:00 and 18:0019:00 as a percentage of daily sales, thus revealing what proportion of the whole day's sales occurred between those times. The aim of this was to identify trends during that particular time of day while eliminating the effects of natural shifts in the sales cycle of the venue. The same calculation was done for the 10 weeks around the fast and slow weeks when the background music was not manipulated in order to identify the likely figures for a normal week, and the average of these figures was calculated and used as the control figure.

This technique brought a new issue to bear however, that being the effect of high sales on Friday evenings, as illustrated by Figure 1, which shows the sales figures for the week when the tempo of the background music was slower, Figure 2, which shows the sales figures for the week when the tempo was faster, and Figure 3, which shows the mean values of the sales figures for the ten weeks that were used for the control condition. Because the figures were now being calculated as a percentage of total daily takings, the sharp increase in sales every Friday evening,
which normally began at some point between 19:00 and 21:00, meant that Friday's percentage was roughly half that of any of the other days of the week. The overall average percentage of daily sales occurring between 16:00 and 19:00 on Monday to Thursday ranged from approximately 19.92\%-27.05\%, whereas Friday's figure was around $12.3 \%$ (figures are generally given to two decimal places here and in the results section). The only way this could be overcome, unfortunately, was to leave the Friday data out of the analysis.


FIGURE 1: Sales during the slow condition


FIGURE 2: Sales during the fast condition


FIGURE 3: Mean sales for the control condition

The third issue that became apparent was that due to special events, there were spikes in sales on particular days in the control data, similar to those seen on each Friday. These occurred on the evenings of Wednesday, 31 ${ }^{\text {st }}$ December 2008 (New Year's Eve) and Monday, 5 ${ }^{\text {th }}$ January 2009 (the day before the Epiphany bank holiday). These spikes are illustrated by Figure 4 and Figure 5. Because these unusual increases in sales affected the calculation of average figures for the control condition, they were simply eliminated along with the Friday figures.


FIGURE 4: Sales in the week beginning 29 $^{\text {th }}$ December, 2008


FIGURE 5: Sales in the week beginning $5^{\text {th }}$ January, 2009

## 4 RESULTS

### 4.1 Duration data

Duration data was taken for individual customers in the venue, based on their times of arrival and departure from their tables, giving individual readings that were recorded in minutes. There were 90 individual results for the slow week and 97 for the fast week. The duration results showed a wide range, falling between 10 minutes and 151 minutes ( 2 hours and 31 minutes) in the slow condition and between 4 minutes and 159 minutes ( 2 hours and 39 minutes) in the fast condition. Perhaps unsurprisingly, the majority of results fell within the middle range of 2070 minutes. Overall the figures for the fast and slow conditions seem fairly similar. Figure 6 is a column chart showing a comparison of the frequencies of occurrence for ranges of durations in both the slow and the fast condition.

The mean values for the duration of time customers spent in the venue were markedly similar between the two conditions. In the slow condition the mean was 52.52 minutes, and in the fast condition the figure was 54.73 minutes. The means for each individual day were also calculated, and these ranged between 45.44 minutes (Wednesday) and 67.69 (Tuesday) in the slow week and between 37.21 minutes (Tuesday) and 64.56 (Monday) in the fast week. For the full duration data, see Appendix B.


FIGURE 6: Frequency of occurrence of different durations in each condition

The t-test of the duration data revealed, unsurprisingly, that the tempo of the background music had no significant effect on the duration of time spent by customers in the venue. The mean duration in the slow condition was 52.52 minutes, with a standard deviation of 28.92 . In the fast condition, the mean duration was 54.73 minutes and the standard deviation was 30.37 . The $p$ value obtained from the t -test was 0.612 for a 2-tailed t -test. $(\mathrm{t}=-0.509, \mathrm{df}=185)$, indicating that there was no significant difference, and therefore tempo of background music was not found to affect the length of time spent in the venue by customers and the null hypothesis was upheld.

### 4.2 Sales data

Sales data was recorded from the venue's sales system as hourly takings for the observation days, as well as for the ten weeks around the observation weeks, meaning that all in all, sales data was obtained for the twelve weeks from $29^{\text {th }}$ December, 2008 to $22^{\text {nd }}$ March, 2009. The data from the weeks during which there were no observations was used to form a data set for a control condition. For the reasons described above, data from Fridays and also from Wednesday, 31 ${ }^{\text {st }}$ December 2008 and Monday, $5^{\text {th }}$ January 2009 were eventually left out of the calculations.

It seemed at the outset that faster tempo background music caused higher sales, because sales between 16:00 and 19:00 in the fast week were approximately 9.61\% higher than those in the slow week. However, the overall sales for the fast week were around $33.66 \%$ higher than in the slow week, which explains the above figure - the higher sales between 16:00 and 19:00 was caused by higher sales overall during that week. As it happens, the fact that the sales during the observation periods were higher by a much smaller margin suggests that the effect may have been the opposite of what was initially suspected, i.e. that slower background music might have led to higher sales.

When the takings for the three hours between 16:00 and 19:00 were viewed as a
percentage of the total takings for the days in which they occurred, it appeared that the above suggestion may have been confirmed. The overall percentage for the slow condition was around $27.66 \%$ and for the fast condition $18.01 \%$, with the control condition falling between the two at approximately $23.08 \%$. When calculating the percentage of total daily takings based on each individual hour's takings between 16:00 and 19:00, rather than the cumulative percentage of all three hours, the results were similar. The average percentage in the slow condition was around $9.15 \%$, in the fast condition $6.27 \%$ and in the control condition $8.04 \%$, with approximate values ranging between $4.17 \%$ and $15.91 \%$ (with a standard deviation of $3.28 \%$ ) in the in the slow week, $2.75 \%$ and $9.61 \%$ (standard deviation $2.07 \%$ ) in the fast week and $5.79 \%$ and $11.28 \%$ (standard deviation $1.78 \%$ ) for the control condition (it is not surprising that the range is smaller in the control condition, as these figures are based on an average of 10 weeks' data. The lowest and highest figures during those 10 weeks were $2.02 \%$ and $19.17 \%$ respectively). Figure 7 shows the mean values with error bars for the figures described above. For the full sales data, see Appendix C.


Error bars: $95 \% \mathrm{Cl}$
FIGURE 7: Mean percentage of daily sales in each condition, with error bars

When a one-way ANOVA was run on the hourly data, significance was found, with a $p$ value of $0.024(\mathrm{~F}=4.182, \mathrm{df}=2)$. Two post-hoc tests were run on the data (LSD and Bonferroni), with both finding a high level of significance in the difference between the data for the fast and slow conditions ( 0.007 and 0.022 respectively). These tests also revealed a bigger difference between the fast data and the control data ( 0.087 in the LSD and 0.261 in the Bonferroni) than between the slow data and the control data ( 0.278 in the LSD and 0.835 in the Bonferroni). These results indicate that the spending of customers in the slow music condition was significantly higher than that in the fast music condition, therefore the null
hypothesis for this part of the experiment was rejected. The results also suggest that the effect of faster background music in decreasing spending was greater than the effect of slower music in increasing it.

## 5 CONCLUSIONS

### 5.1 Conclusion and discussion

In this study, it was found that while the tempo of background music in a bar did not noticeably affect the time spent in the bar by customers, it did produce a significant effect upon the amount of money that was spent in the bar. During the times that slow music was used as background music, the income of the bar as a percentage of the whole day's income was significantly higher than that during the times when fast music was used. Furthermore, during the times when the background music was normal (i.e. randomly selected by the venue's music system from the available selection of tracks, representing a range of tempi), the income of the bar during the same period as a percentage of the whole day's income was found to be higher than during the fast condition and lower than during the slow condition. Thus, it could be said that customers stayed about the same amount of time but spent more during the slow condition. Milliman (1986) who found similar results, suggests that this may be because "slower, perhaps more soothing background music created a more relaxing environment (greater approach condition)" (p.288). Indeed, in The social and applied psychology of music, North and Hargreaves (2008) cite a number of studies that support the idea that people prefer to listen to music that moderates their state of arousal - in other words, during a relaxing activity, people would want to listen to low-arousal music, whereas in high-arousal activities, they would choose to listen to music that
further heightened their state of arousal. Perhaps it could be said then, that the slower, presumably less arousal-inducing music used in the slow condition of the present study produced a more preferable atmosphere for customers who may have wished to enjoy a relaxing afternoon coffee or beer.

As regards an explanation for the lack of a significant effect of music tempo upon duration of stay, there are a number of possible suggestions. The venue at which the study was conducted is used for a number of different social purposes and a range of activities are available there, such as gambling machines, electronic games machines, board games, books, a pool table and others. This means that the amount of time spent there by customers can often be altered from the original intention, even during the visit. It also appeared from casual observations made during the study that many of the regular customers do not go with others or in order to meet particular people, but they may go on the off-chance that they will meet someone they know, meaning that they might come and go more quickly on a quiet day or when no one they know is present than on a day when they see many familiar faces, and again the original intention can be changed, for example by a friend entering the bar and persuading someone to stay just as they were planning to leave. This suggests that the reasons for customers staying as long as they do are affected by much more than the atmosphere of the bar alone.

Although perceived duration is neither an indicator of nor necessarily connected
to the amount of time an individual remains engaged with an activity, it is logical to suppose that there may be some connection. In that sense, this study supports Caldwell and Hibbert (2002), who found that perceived duration was not affected by the tempo of background music. The reason suggested for the result discovered in that study and other similar ones (such as Oakes, 1999), alongside other findings like those of Kellaris and Kent (1991) where tempo of music was found to affect judgments of duration, was that perception of duration may be affected by whether the subjects are passively exposed to the music or actively listening to it (Caldwell \& Hibbert, 2002).

### 5.2 Limitations of the study

Because different tracks were used for the fast and slow playlists, rather than the same tracks at altered tempi, it may be that factors other than tempo such as "musical preference, musical style, key, mode, harmonies and timbre" (Herrington, 1996, p.30) have affected the results. However, as explained earlier, it was felt that the methodology used was the most sound for this type of experiment.

Measuring duration of stay turned out to be more complex than originally assumed because customers were in the venue for so many different reasons that affected the amount of time they spent there - some were playing games, some
were spending a few hours drinking alcohol, and some were spending a quick visit just to drink tea or coffee, thus the duration times varied greatly.

During the data analysis, some issues had to be overcome that were not accounted for in the planning phase of this research. More thorough and experienced planning and more detailed pilot studies could have minimised the risk of these issues occurring. According to Dunn (2009), insufficient planning is a common issue in research. In the case of this study for example, it would have been beneficial to have more sales data available for the analysis of the effects of tempo on spending, as the data from Fridays had to be eliminated due to a sharp rise in spending that made the sales figures from Friday evenings disproportionate to the rest of the week. Several weeks of sales data in each condition would have given more reliable results, and given the apparent findings of this study more validity.

It is important to recognise that the findings of this study should not be assumed to be an outright indication that spending in a bar will increase when the background music is slower, and as such they should not be taken as a recommendation for action by businesses. The results cannot be generalised, not least because they were found in just one particular bar in central Finland, and observations took place during particular hours of the day. Also, it is unclear whether the results discovered in this study would prevail over a sustained period
of time. This is because altering the style or limiting the range of music played may cause brand disassociation with the venue amongst customers, leading to a fall in sales over the longer-term.

### 5.3 Recommendations for further study

As identified, this study has been limited in its approach, and there are many aspects that should be expanded upon in order to give a deeper insight into the mechanisms that govern the phenomena observed and to further investigate how background music affects behaviour in commercial environments. One possible extension to this study would be to obtain data for individual transactions rather than taking figures for total spending only, in order to find whether spending was affected in terms of the frequency with which transactions occurred or the amount spent per transaction, or both.

As mentioned in 5.2 Limitations of the study, customers visited for many different reasons. A way to eliminate this issue could have been to measure how long on average customers took to drink one drink, rather than the total time spent in the venue. It would also be interesting to know whether the effects found operate on a conscious or unconscious level - for example, do customers notice how much they are spending, are they aware of the tempo of the music, does tempo of background music link with preference for the music, and is their perception of
time passing affected by the tempo of background music?

The surface has only been scratched of the effects of music upon consumer behaviour, and the possibilities for further research that would expand and enrich the growing body of knowledge in this fascinating, rewarding and increasingly relevant field are numerous, if not endless.

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## APPENDICES

Appendix A: Playlists used in the experiment

Appendix B: Full duration data

Appendix C: Full sales data




| Length | Performer |
| :--- | :--- |
| 4:44 | Rimes, Lee Ann |
| 6:25 | Jackson, Michael |
| 4:12 | Europe |
| 2:02 | Cale, J.J. |
| 2:24 | Rolling Stones, The |
| $3: 37$ | Beck |
| 3:35 | Kravitz, Lenny |
| $3: 33$ | Streisand, Barbara |
| 2:59 | Savage Garden |
| $3: 48$ | Marx, Richard |
| $3: 52$ | Berlin |
| $4: 30$ | Seal |
| $3: 28$ | Various Artists |
| $6: 10$ | Metallica |
| $4: 15$ | Madonna |
| $3: 11$ | Simple Plan |
| $4: 26$ | Turunen, Tarja |
| $1: 45$ | Everly Brothers, The |
| $3: 25$ | Crash Test Dummies |
| $3: 40$ | Michael, George |
| $4: 44$ | Roxette |
| $2: 31$ | Whitterspoon, Jimmy |
| $3: 03$ | Fun Lovin' Criminals |
| $4: 10$ | Radiohead |
| $4: 18$ | Astley, Rick |
| $4: 23$ | Clapton, Eric |
| $3: 51$ | Corrs, The |
| $4: 06$ | Nightwish |
| $6: 08$ | Scorpions |
| $4: 00$ | Scaramangas, The |
| 1 |  |

Appendix A: Playlists used in the experiment

## Style (according to venue's media system)

Rock Pop
Dance 90s Euro
Pop
Rock Pop
Rock Pop
Rock Pop
Slow
Pop Oldies
Slow Slow
Pop
Rock Pop Pop Oldies
Slow
Pop Oldies Pop Oldies
Slow
Slow
Pop Oldies Pop Oldies Pop Oldies Slow 3.
0
0
0


Appendix A: Playlists used in the experiment Playlist for fast condition Style (according to venue's media system) Pop Oldies
Rock
Rock
Rock Pop
Suomi Rock
Blues
Dance 80s
Dance 80s
Rock
Pop
Rock Pop
Rock Pop
Rock
Rock
Pop Oldies
Rock
Latin Pop
Rock
Rock
Pop
Rock Pop
Rock Pop
Rock Pop
Pop
Pop
Rock n Roll
Rock Pop
Rock
Rock Pop
Pop Oldies

Piece
Sugar and spice Gimme some lovin'

Kiss of life
This is forever
Pokka
Have you heard Holding out for a hero
Dancing with tears in my eyes
Born to be wild Holding out for a hero
Dancing with tears in my eyes
Born to be wild Born to be wild
My favourite gam

My favourite game
Got my mind set on you Living in America

Crashing down White wedding Sunday girl Dive I am somebody My Sharona

The saints are coming Johnny \& Mary Mr. Brightside Message in a bottle Just like heaven Two hearts The heat is on La Bamba Synchronicity 2 Who invited you


Solitary man

| Length | Performer |
| :--- | :--- |
| 1:59 | Searchers, The |
| 2:45 | Blues Brothers, The |
| $3: 44$ | Pakarinen, Hanna |
| $4: 36$ | Guitar Slingers |
| $3: 52$ | Irina |
| $5: 36$ | Clapton, Eric \& Mayall, John |
| $4: 04$ | Tyler, Bonnie |
| $3: 15$ | Ultravox |
| $3: 11$ | Steppenwolf |
| $3: 13$ | Cardigans, The |
| $3: 32$ | Harrison, George |
| $3: 09$ | Sounds, The |
| $3: 27$ | Emmi |
| $3: 13$ | Idol, Billy |
| $2: 46$ | Blondie |
| $3: 30$ | Feiled |
| $3: 44$ | Santana, Carlos, feat. Will.I.Am |
| $3: 28$ | Leningrad Cowboys |
| $3: 09$ | U2 \& Greenday |
| $3: 38$ | Palmer, Robert |
| $3: 24$ | Killers, The |
| $4: 29$ | Police, The |
| $3: 14$ | Cure, The |
| $3: 07$ | Collins, Phil |
| $3: 14$ | Frey, Glenn |
| $2: 34$ | Los Lobos |
| $4: 39$ | Police, The |
| $3: 14$ | Donnas, The |
| $2: 23$ | Clash, The |
| $2: 17$ | Diamond, Neil |
|  |  |



Appendix A: Playlists used in the experiment Playlist for fast condition Style (according to venue's media system) Rock
Rock n Roll Pop Pop Oldies Rock
Rock Pop Rock Heavy Rock Pop Pop Pop Oldies 80nc Rock Dance 80s Pop Oldies Rock Pop Oldies Pop Oldies Pop Oldies Rock $n$ Roll Rock Pop Rock $n$ Roll Rock Pop Pop Rock Pop Rock Pop Pop Piece
Guardian angel
You're the one that I want Song to say goodbye Hit the road Jack Judy in disguise Back in yer face Affirmation
Easy Livin'
Land of a thousand dances Show me
Dedicated follower of fashion Tell him
Take on me
Runnin' down a dream Part-time lover Juke box jive Straight in two
Do you wanna dance
Little girl
You've got what I like You've got what I like
Swing the mood I'll be there for you You can't hurry love Breaking the habit I'm so excited Same about the sorrow Don't get me wrong Blue moon nights Walking on sunshine


Travolta, John \& Newton-John, Olivia Placebo

Poindexter, Buster Fred, John \& His Playboyband Hanoi Rocks Savage Garden Heep, Uriah Commitments, The Dexy's Midnight Runners Kinks, The Shepard, Vonda A-ha

Petty, Tom \& The Heartbreakers Wonder, Stevie Rubette's, The Defuse Doors, The

Syndicate Of Sound Gerry \& The Pacemakers Jive Bunny \& The Mastermixers Rembrandts, The Rembrandts,
Collins, Phil Linkin Park Weather Girls So Called Plan Pretenders, The Fogerty, John Katrina \& The Waves镸 $2: 31$
$3: 17$
$2: 55$
$2: 37$
$3: 19$
$4: 25$
$2: 19$
$2: 55$
$3: 03$
$2: 44$
$2: 31$
$3: 20$
$4: 04$
$3: 25$
$2: 46$
$3: 06$
$7: 30$
$1: 58$
$2: 11$ 2:11 $\stackrel{\infty}{\infty}$ $\underset{\sim}{n} \underset{\sim}{\underset{\sim}{\sim}} \underset{\sim}{\underset{\sim}{n}}$ $\stackrel{-}{\dot{n}}$ $\stackrel{0}{\underset{\sim}{i}}$ $\stackrel{N}{N}$

| Appendix B: Full duration data |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Arrive | Depart | Duration |  | Arrive | Depart | Duration |  | Arrive | Depart | Duration |  | Arrive | Depart | Duration |  | Arrive | Depart | Duration |  | Arrive | Depart | Duration |  | Arrive | Depart | Duration |
| Slow condition: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16.2.2009 | 1 | 17:08 | 18:11 | 1:03 | 51 | 17:02 | 18:11 | 1:09 | 9 | 17:36 | 18:10 | 0:34 | 13 | 17:06 | 18:54 | 1:48 | 17 | 16:13 | 16:34 | 0:21 | 21 | 17:37 | 18:34 | 0:57 | 25 | 16:31 | 17:13 | 0:42 |
|  | 2 | 17:13 | 18:04 | 0:51 | 61 | 16:06 | 16:22 | 0:16 | 10 | 17:07 | 18:54 | 1:47 | 14 | 16:17 | 16:38 | 0:21 | 18 | 16:13 | 16:34 | 0:21 | 22 | 17:37 | 18:34 | 0:57 | 26 | 16:31 | 17:13 | 0:42 |
|  | 3 | 17:13 | 18:04 | 0:51 | 71 | 16:06 | 16:22 | 0:16 | 11 | 17:07 | 18:54 | 1:47 | 15 | 16:17 | 16:38 | 0:21 | 19 | 16:58 | 17:28 | 0:30 | 23 | 16:09 | 17:45 | 1:36 | 27 | 17:38 | 18:03 | 0:25 |
|  | 4 | 17:06 | 18:11 | 1:05 | 81 | 17:36 | 18:10 | 0:34 | 12 | 17:06 | 18:54 | 1:48 | 16 | 16:13 | 16:34 | 0:21 | 20 | 16:58 | 17:28 | 0:30 | 24 | 16:09 | 17:45 | 1:36 | 28 | 17:38 | 18:03 | 0:25 |
| 17.2.2009 | 1 | 16:12 | 17:57 | 1:45 | 51 | 17:32 | 18:39 | 1:07 | 9 | 16:03 | 16:54 | 0:51 | 13 | 16:28 | 17:01 | 0:33 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 16:21 | 17:57 | 1:36 | 61 | 17:32 | 18:39 | 1:07 | 10 | 16:48 | 17:45 | 0:57 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3 | 16:21 | 17:57 | 1:36 | 71 | 16:28 | 17:01 | 0:33 | 11 | 16:48 | 17:45 | 0:57 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 4 | 16:17 | 17:10 | 0:53 | 8 | 16:03 | 18:34 | 2:31 | 12 | 16:48 | 17:45 | 0:57 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18.2.2009 | 1 | 18:11 | 18:39 | 0:28 | 51 | 18:35 | 19:24 | 0:49 | 9 | 19:14 | 19:46 | 0:32 | 13 | 18:16 | 19:10 | 0:54 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 17:35 | 18:19 | 0:44 | 61 | 18:35 | 19:24 | 0:49 | 10 | 17:42 | 18:51 | 1:09 | 14 | 18:48 | 19:10 | 0:22 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3 | 18:25 | 19:30 | 1:05 | 7 | 19:14 | 19:46 | 0:32 | 11 | 17:42 | 18:51 | 1:09 | 15 | 17:49 | 18:21 | 0:32 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 4 | 18:26 | 19:30 | 1:04 | 81 | 19:14 | 19:46 | 0:32 | 12 | 18:16 | 19:10 | 0:54 | 16 | 17:49 | 18:21 | 0:32 |  |  |  |  |  |  |  |  |  |  |  |  |
| 19.2.2009 | 1 | 16:18 | 17:28 | 1:10 | 51 | 17:11 | 18:04 | 0:53 | 9 | 18:24 | 19:09 | 0:45 | 13 | 16:56 | 17:42 | 0:46 | 17 | 17:57 | 18:38 | 0:41 |  |  |  |  |  |  |  |  |
|  | 2 | 16:19 | 18:30 | 2:11 | 61 | 17:11 | 18:04 | 0:53 | 10 | 18:20 | 19:09 | 0:49 | 14 | 17:52 | 18:34 | 0:42 | 18 | 16:33 | 18:31 | 1:58 |  |  |  |  |  |  |  |  |
|  | 3 | 16:19 | 17:28 | 1:09 | 7 | 17:03 | 17:15 | 0:12 | 11 | 18:20 | 19:09 | 0:49 | 15 | 17:52 | 18:34 | 0:42 | 19 | 17:00 | 17:20 | 0:20 |  |  |  |  |  |  |  |  |
|  | 4 | 17:38 | 18:30 | 0:52 | 8 | 17:03 | 17:15 | 0:12 | 12 | 16:56 | 17:42 | 0:46 | 16 | 17:57 | 18:38 | 0:41 | 20 | 17:00 | 17:20 | 0:20 |  |  |  |  |  |  |  |  |
| 20.2.2009 | 1 | 18:16 | 18:26 | 0:10 | 51 | 16:21 | 17:40 | 1:19 | 9 | 17:15 | 18:28 | 1:13 | 13 | 17:40 | 18:24 | 0:44 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 16:22 | 17:08 | 0:46 | 61 | 16:21 | 17:40 | 1:19 | 10 | 17:15 | 18:28 | 1:13 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3 | 16:29 | 17:08 | 0:39 | 7 | 16:37 | 16:58 | 0:21 | 11 | 17:08 | 17:31 | 0:23 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 4 | 16:22 | 17:40 | 1:18 | 8 | 18:43 | 19:06 | 0:23 | 12 | 17:40 | 18:24 | 0:44 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Fast condition: |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2.3.2009 | 1 | 16:23 | 17:48 | 1:25 | 5 | 17:38 | 18:47 | 1:09 | 9 | 16:32 | 17:44 | 1:12 | 13 | 16:25 | 17:00 | 0:35 | 17 | 16:58 | 18:24 | 1:26 | 21 | 16:25 | 17:33 | 1:08 | 25 | 17:48 | 18:31 | 0:43 |
|  | 2 | 16:25 | 17:21 | 0:56 | 61 | 17:39 | 18:47 | 1:08 | 10 | 16:40 | 18:36 | 1:56 | 14 | 16:25 | 17:00 | 0:35 | 18 | 17:10 | 18:28 | 1:18 | 22 | 18:06 | 18:41 | 0:35 | 26 | 17:48 | 18:31 | 0:43 |
|  | 3 | 16:25 | 17:21 | 0:56 | 7 | 16:32 | 17:10 | 0:38 | 11 | 16:41 | 18:36 | 1:55 | 15 | 17:05 | 18:13 | 1:08 | 19 | 17:10 | 18:28 | 1:18 | 23 | 16:25 | 16:35 | 0:10 | 27 | 16:37 | 17:02 | 0:25 |
|  | 4 | 17:38 | 18:47 | 1:09 | 8 | 16:53 | 17:44 | 0:51 | 12 | 16:41 | 18:36 | 1:55 | 16 | 17:05 | 18:13 | 1:08 | 20 | 17:10 | 18:28 | 1:18 | 24 | 16:25 | 17:48 | 1:23 |  |  |  |  |
| 3.3.2009 | 1 | 17:28 | 18:21 | 0:53 | 5 | 18:22 | 19:00 | 0:38 | 9 | 16:06 | 17:29 | 1:23 | 13 | 17:02 | 17:52 | 0:50 | 17 | 17:58 | 18:02 | 0:04 |  |  |  |  |  |  |  |  |
|  | 2 | 17:51 | 18:21 | 0:30 | 611 | 18:22 | 19:00 | 0:38 | 10 | 17:28 | 17:48 | 0:20 | 14 | 18:29 | 18:57 | 0:28 | 18 | 17:22 | 17:47 | 0:25 |  |  |  |  |  |  |  |  |
|  | 3 | 17:01 | 17:22 | 0:21 | 71 | 17:50 | 18:21 | 0:31 | 11 | 17:28 | 17:48 | 0:20 | 15 | 17:15 | 18:05 | 0:50 | 19 | 17:22 | 17:47 | 0:25 |  |  |  |  |  |  |  |  |
|  | 4 | 17:01 | 17:22 | 0:21 | 8 | 16:06 | 17:29 | 1:23 | 12 | 17:12 | 17:48 | 0:36 | 16 | 17:14 | 18:05 | 0:51 |  |  |  |  |  |  |  |  |  |  |  |  |
| 4.3.2009 | 1 | 16:48 | 17:56 | 1:08 | 51 | 16:39 | 17:14 | 0:35 | 9 | 16:20 | 18:59 | 2:39 | 13 | 17:40 | 18:12 | 0:32 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 17:24 | 17:56 | 0:32 | 6 | 16:20 | 16:36 | 0:16 | 10 | 17:32 | 18:50 | 1:18 | 14 | 17:40 | 18:12 | 0:32 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3 | 17:52 | 18:32 | 0:40 | 7 | 16:20 | 16:36 | 0:16 | 11 | 17:32 | 18:50 | 1:18 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 4 | 17:10 | 18:08 | 0:58 | 8 | 16:20 | 18:59 | 2:39 | 12 | 18:08 | 18:21 | 0:13 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5.3.2009 | 1 | 17:09 | 18:29 | 1:20 | 5 | 17:40 | 18:39 | 0:59 | 9 | 17:42 | 18:35 | 0:53 | 13 | 16:20 | 16:46 | 0:26 | 17 | 18:08 | 18:36 | 0:28 | 21 | 17:58 | 18:42 | 0:44 |  |  |  |  |
|  | 2 | 16:39 | 17:37 | 0:58 | 6 | 17:40 | 18:39 | 0:59 | 10 | 17:42 | 18:35 | 0:53 | 14 | 16:20 | 16:46 | 0:26 | 18 | 17:01 | 18:03 | 1:02 | 22 | 17:58 | 18:42 | 0:44 |  |  |  |  |
|  | 3 | 17:38 | 18:02 | 0:24 | 7 | 16:18 | 17:41 | 1:23 | 11 | 17:29 | 18:16 | 0:47 | 15 | 16:36 | 18:29 | 1:53 | 19 | 17:01 | 18:03 | 1:02 |  |  |  |  |  |  |  |  |
|  | 4 | 17:38 | 18:02 | 0:24 | 8 | 17:11 | 18:37 | 1:26 | 12 | 18:21 | 18:48 | 0:27 | 16 | 18:08 | 18:36 | 0:28 | 20 | 17:26 | 17:47 | 0:21 |  |  |  |  |  |  |  |  |
| 6.3.2009 | 1 | 16:38 | 17:20 | 0:42 | 5 | 16:43 | 17:17 | 0:34 | 9 | 18:24 | 18:42 | 0:18 | 13 | 16:13 | 17:20 | 1:07 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 2 | 17:34 | 18:37 | 1:03 | 6 | 16:43 | 17:17 | 0:34 | 10 | 17:43 | 19:00 | 1:17 | 14 | 16:24 | 17:20 | 0:56 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 3 | 17:11 | 18:37 | 1:26 | 7 | 16:14 | 17:57 | 1:43 | 11 | 17:43 | 19:00 | 1:17 | 15 | 16:24 | 17:20 | 0:56 |  |  |  |  |  |  |  |  |  |  |  |  |
|  | 4 | 17:11 | 18:37 | 1:26 | 8 | 16:14 | 17:57 | 1:43 | 12 | 16:40 | 17:14 | 0:34 |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |


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37,40 € \\
41,00 € \\
119,20 € \\
163,50 € \\
185,90 € \\
140,19 € \\
145,79 € \\
160,18 € \\
196,00 € \\
40,00 € \\
0,00 € \\
0,00 €
\end{gathered}
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