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THE EFFECTS OF MUSIC AND TEMPO ON CONSUMER'S TIME
PERCEPTION IN ONLINE SHOPPING

CANSIN TUNA
115699003

DR. ÖĞR. ÜYESİ BARIŞ URSAVAŞ

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The Effects of Music and Tempo on Consumer's Time Perception in Online Shopping
Online Alışverişte Müzik ve Temponun Tüketicinin Zaman Algısına Etkisi

Cansın Tuna

115699003

Tez Danışmanı : Dr. Öğr. Üyesi Barış Ursavaş
İstanbul Bilgi Üniversitesi



Juri Üyeleri : Doç. Dr. E. Eser Gegez
İstanbul Bilgi Üniversitesi



Prof. Dr. Beril Durmuş
Marmara Üniversitesi



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PREFACE

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ABSTRACT

The present study aims to investigate the effects of musical presence and musical tempo on consumers' time perception in online shopping. At the present time online platforms increase day by day and the brands and the marketeers have to find more effective and different ways in addition to their online marketing strategy to keep their customers satisfied. With the advanced technology that we have today, customers not only would like to reach the products or services online, they also would like to fulfill their desires as fast as they can in terms of time. Previous studies show that customers' time perception can be manipulated by various variables and one of the most effective and used variable is music. In this present study, it is investigated that can customers' speed of time judgments and duration estimation judgments be manipulated by presence of music and different musical tempo in order to make customers to have more quality and hedonic time with the perception of time seems to pass faster or slower while online shopping.

Keywords: Marketing, online marketing, music and marketing, music and time perception, time perception

ÖZET

Bu çalışma online alışveriş sırasında müziğin varlığı ve farklı müzik tempolarının tüketicilerin zaman algısı üzerine olan etkilerini araştırmayı amaçlamaktadır. Günümüzde online mecralar her geçen gün büyük bir hızla gelişmektedir, buna ek olarak markalar ve pazarlama profesyonelleri online pazarlama stratejilerine müşterilerini memnun edebilmek adına daha verimli ve farklı çözümler eklemeyi amaç edinmektedir. Günümüzün gelişen ileri teknolojisi ile birlikte, tüketiciler yalnızca aradıkları hizmet ve ürünlere online erişebilmek ile yetinmemekte, buna ek olarak isteklerini olabilecek en hızlı şekilde yerine getirmeyi amaçlamaktadırlar. Geçmiş çalışmalar göstermektedir ki, tüketicilerin zaman algısı pek çok değişken ile manipüle edilebilmektedir ve bunların en verimli ve en çok kullanılanlarından birisi müziktir. Bu çalışmada, online alışveriş sırasında tüketicilere daha kaliteli ve keyifli zaman geçirtebilmek adına, zamanın olduğundan daha hızlı ya da yavaş geçtiği efekti yaratılarak, müziğin varlığı ve tempo ile tüketicilerin subjektif zaman hızı algısı ve belirli bir aralıktaki süreyi tahmin etmeleri manipüle edilebilir mi sorusu deneysel olarak araştırılmıştır.

Anahtar kelimeler: Pazarlama, online pazarlama, müzik ve pazarlama, müzik ve zaman algısı, zaman algısı

INTRODUCTION

The present study aims to investigate the effects of musical presence and musical tempo on consumers' time perception in online shopping. Previous researches about effects of music on consumers' time perception commonly have been conducted by offline activities that are done by the customers. Online area has been chosen because in the modern age, nowadays digital platforms are being developed at a great pace and online area has become the most essential channel for the brands and the marketers. In fact it became an unthinkable scenario that having no online channels for the brands. Even though the businesses operate only in offline channels, to market the businesses and promote the services and the products of the business, brands need to use and support internet marketing. Internet has brought tremendous changes in our lifestyle and it became mandatory for the businesses to recognise this and establish their presence on the online platforms and to develop an effective online marketing strategies.

Online marketing basically is the use of diverse and evolving set of internet based digital techniques to reach the targeted audiences. With online marketing businesses can deliver content to their customers through personalized and cost effective communication. The techniques that are used in online marketing strategies include but not limited to content marketing, social media, websites, search engine optimization, online video, email marketing, paid search and more. Many of these tools work best together but effective online marketing is really a complex ecosystem of techniques that can help the businesses achieve greater visibility and credibility.

Besides the fact that to have an effective digital marketing strategy is very important for the companies, the marketers are facing more complex and ever-changing digital landscapes increasingly. Furthermore the marketing budgets aren't infinite and the companies have to be selected or differentiated from the others by leaving a different impression for their customers in order to have the most effective feedbacks from their online marketing strategy.

In order to differentiate from the other companies, the brands use the music and its effects for a very long time in their general marketing strategy and when it comes to branding there might be no better way than using music to help a customer to remember your brand promise. Music also evokes emotional responses in listeners which is absolutely utilized in advertising. Additionally various studies shows that music can affect the mood, perception of time, sales, interaction between sellers and buyers, selection of product, duration and quantity of purchase (Spangenberg et. Al, 2005). Therefore background music is considered to be one of the several atmospheric variables that can affect customer evaluations, purchase intent, mood, attitude and behavior (Herrington & Capella, 1996).

On the other hand, in addition to have an effective online marketing strategy and the usage of music to differentiate the business from the other companies, there is another important asset in digital age, the speed concept. It is one of the main reasons for customers to move online channels, people would like to reach the products or the services without waiting in the lines or they would like to reach their feedbacks to the companies about their experiences as soon as possible. For this reason it is became an advantage for the brands to present services or products to their customers at the most effective speed.

The usage of music for differentiating the brand from the other companies and the findings of the music affects time perception of the consumers', also the speed concept becoming very important asset in the digital age gave the idea to this research to use music in online shopping in order to understand if it is possible to manipulate consumers' time perception with music and musical tempo.

There are numerous previous research about the effects of music and musical characteristics on the customers. These effects are categorized cognitive, emotional and behavioral (Oakes, 2000). In some of the research music was used in order to measure customers' duration estimates and subjective passage of time judgments (Wearden, 2005; Mailov, 2015; Zakay & Block, 1994) and also in other research focused on the

other effects of the music such as on consumers' memory (Block, 1992; Oakes & North, 2006; Mailov, 2015).

This study focuses on the effects of musical presence and musical tempo on consumers' time perception as duration estimates and subjective speed of time judgments with the same event. Thence, these two concepts of time perception could be analysed in the same experimental condition.

1. THEORITICAL BACKGROUND

1.1. MUSIC REVIEW

Throughout the history people used music for expressing their feelings, thoughts and events of their lives (Karkin & Akkuş, 2009). Music is an inseparable component of human culture whether it is composed by an orchestra as a symphony or is heard as a simple melody while walking on the street, music influences human soul and brings people together emotionally in a very strong way (Ursavaş, 2011). In addition to being one of the communication tools between people, in ancient societies music compensated religious, spiritual, healing and social roles integratedly (Byers, 2016).

Over time music is said to be a universal language and the idea that everyone could sense the music became a consensus. The famous sentence “Music is the universal language of mankind” was stated by Henry Wadsworth Longfellow and he is credited with the line but also including E. T. A. Hoffmann, Eduard Hanslick, Arthur Schopenhauer and Charles Batteux touched upon the same matter in analogous words (Higgins, 2012). As a result of this, music has huge impact on bringing complete stranger people together around mutual and extensive emotions and ideas as a powerful communication tool (Ursavaş, 2011).

In the early 1900s, the capacity of music to affect human emotions and behavior has attracted the attention of marketers in order to use this powerful tool in advertisement activities and as a result of that music had a big skip into advertising first with radio and in 1950s with television (Kellaris, 1993).

1.1.1. Music in Marketing

The idea of background music can affect consumer behavior comes from the concept of “atmospheric” (Herrington & Capella, 1996). Baker (1996) classifies atmospheric elements in three groups as design, social and environmental and evaluates music in environmental elements. Music affects the limbic system of brain that contains emotions whereat it can also affect the mood of consumers (McDonnell, 2007). Various studies shows that music can affect the mood, perception of time, sales, interaction between sellers and buyers, selection of product, duration and quantity of purchase (Spangenberg et. Al, 2005). Therefore background music is considered to be one of the several atmospheric variables that can affect customer evaluations, purchase intent, mood, attitude and behavior (Herrington & Capella, 1996).

Researchers that investigate consumer behavior and their atmospheric reactions evaluated the effects of musical characteristics such as tempo, genre, harmony etc., by examining the properties of these characteristics on consumer’s time perception, mood, speed and amount of expenditure (Karkin & Akkuş, 2009).

As Herrington and Capella (1994) state, two characteristics of music can be mentioned in the literature as structural and emotional. Tempo, sound level, pitch, genre, harmony and rhythm constitute structural features. Emotional features are the elements affecting listener’s sense and attraction to music. In addition to structural elements, familiarity to music, the age of listener, the complexity of the music and cultural background compose emotional features.

There are various studies about structural elements of music and human behavior. For example it is founded that faster and higher level of music, increased performance and arousal during fitness exercises (Edworthy, 2006). Another study shows that when an advertisement with background music with a more congruent timbre was displayed to the participants it increased the advertisement content recall

(Oakes & North, 2006). Oakes (2000) has suggested that specific genres of music can catch different types of customers, for example grown and intellectual people are caught by classical music while younger people are more likely caught by contemporary music. In assorted arrangements, for instance in restaurants it has been shown that musical tempo can affect the time of customers to dine and speed of their conversations (Caldwell & Hibbert, 2002).

It has been found that several other factors such as person's attention, arousal, endurance, speed of decision-making, time perception and memory are effected by musical tempo. (Mailov, 2011). Waterhouse (2010) has suggested that participants had run longer distances on a treadmill with higher musical tempo possibly due to increased arousal. In an another study at a supermarket, it is shown that while a slower tempo music was on the background, participants spent more time on shopping (Milliman, 1982). On the contrary, Herrington and Capella (1996) have stated that musical tempo has no effect on the shopping time and amount of spending, they have suggested that the actual reason of the effect of music comes from the attraction of participants to the music. Sweeney and Wyber (2002) have also stated that musical tempo has impacts on consumers but it is only on consumer's satisfaction.

Musical tempo is comparatively easy to measure and compare therefore most of the researchers have focused on this component of the music. It can be defined as the speed of musical portion (Oakes & North, 2006). It is measured by using metronome and its measurement unit is BPM (beats per minute). Milliman (1982) has proposed that the tempo higher than 94 BPM is considered fast and where it is lower than 72 BPM is considered slow.

Compared to the studies on music sound and tempo, musical variables such as harmony is more difficult to measure (Oakes, 2000). Therefore, the studies on the harmonic effects of music are limited and the researches in this field mostly investigated the effects of the music starting with major and minor switch on waiting

time and behavioral intentions (Kellaris & Kent, 1991).

Sound level of background music is the easiest musical variable to manipulate by researchers but in their research Herrington and Capella (1996) have measured the effect of various variables of music such as sound and rating level and tempo on consumer behavior and have suggested that high or low level of sound have no impact on shopping time or amount of spending. Some researchers who work on sound level effects on to genders have suggested that time estimations differ with high and low level of sound (Kellaris & Altsech, 1992) and genders respond different emotions to sound levels (Kellaris & Rice, 1993).

In the studies on the genre of the music mostly classical music, pop music, jazz music and no music conditions were compared for example Nort and Hargreaves (1999) have suggested that more complex pop music caused the waiting time perceived shorter. In another study of North (2003) customers who listen classical music at the restaurant spent more but in contrast in the study of Wilson (2003) customers found classical music unsuitable to the ambience and spent less time and less drinks in the restaurant.

The genre of music, tempo, sound level etc. variables are important and effective but there are also different elements that affect consumer behavior such that some researchers have suggested that preference related elements have the most important effects on consumer evaluation (Sweeney & Wyber, 2002) insomuch as they increase the spending time and amount (Herrington & Capella, 1996). Findings related to level of appreciation are contradictory because in some studies appreciated music cause perceived time shorter (Cameron et al, 2003) and in some studies it cause perceived time longer (Kellaris & Mentel, 1994). But in spite of participants perceived time longer they approached to the service in a more positive way (Hui et al, 1997). Similar situation exist in the cases of familiarity to the music studies (Bailey & Areni, 2006).

1.1.2. Effects of Music on Consumers

The effect of music on consumers is realized in three ways such as cognitive, emotional and behavioral (Oakes, 2000). Cognitive factors contain customer expectations and the perception of time. Expectations are defined consumer's pre-evaluations about the product or service by using certain clues such as music, scent, color, lighting etc. As Baker (1994) has submitted classical music and soft lighting create high prestigious business conversely popular music and shiny lighting create low prestigious business. The perception of time varies according to different features of music. For example the perceived time is longer with loud music (Kellaris & Altsech, 1992; Baker & Cameron, 1996; Kellaris et al, 1996), whilst it is founded shorter (Cameron et al, 2003) or longer (Yalch & Spangenberg, 1990; Kellaris & Mantel, 1994; Hui et al, 1997) by various researchers with arousal of the music. As a results of the investigations about the effects of familiarity with music on time perception unfamiliar music made participants to stay longer in the atmosphere they are in and also made their perceived time shorter than their actual staying time (Yalch & Spangenberg, 2000). In another research the more complex pop music made the waiting time perceived shorter (North & Hargreaves, 1999).

Emotional factors are generally associated with consumer's mood. For example music improves the emotional appraisal of the service environment, regardless of preference (Hui et al, 1997). Slow-paced music and high costumer concentration composition cause similar hedonistic and utilitarian evaluation with fast-paced music and low customer composition (Eroglu et al, 2005). In addition to that fast-paced music is perceived more exciting comparing to the slow-paced music same as pop music is perceived comparing to the classical music (Sweeney & Wyber, 2002).

Behavioral factors can be summarized as approach behavior, purchase behavior, consumption rate and duration of stay related behavior (Oakes, 2000).

According to psychologists Mehrabian and Russell all the correspondence given to the environment is actualized by approach and avoidance (Donovan et al, 1982). Herrington and Capella (1994) stated that if the music is found suitable with the atmosphere and with the service/product by customers, the approaching to the service/product will be seen. Oakes (2000) also has stated that if the music improves the prestige of the service/product, approach behavior will be seen. In the researches on purchase behavior it is seen that as the appreciation of music increases the amount of spending increases similarly (Herrington & Capella, 1996). In the studies about consumption rate and duration of stay, researchers agreed on the slower tempo and the less level of sound cause customers to move slower on the contrary the more the tempo and sound level increase movements of customers get faster (Milliman 1982, 1986). Additionally if the music genre is suitable with the target group consumption rate and duration of stay will be increased (Herrington & Capella, 1996; Wilson, 2003; Jacob, 2006).

1.1.3. Effects of Musical Tempo on Consumers

There are limited number of research about the effects of music presence and music tempo on consumers' time perception since it is comparatively easy to measure the tempo and the results of these studies vary.

In the study of Gueguen & Jacob (2002), they used two groups, one is with music and the other is without music in on-hold telephone situation. Results showed that the group with music condition tended to underestimate the duration of wait when the group without music tended to overestimate it. In an another study on familiarity of the music shows that participants who heard familiar music underestimated the duration length as compared to who heard unfamiliar music (Bailey et al, 2006).

In another study conducted by Noseworthy & Finlay (2009) investigated music presence in a casino setting and results showed that when the music was presented

participants overestimated the duration. In this same study it is also shown that when the tempo of the music was fast participants gave shorter time estimates in contrast to participants' overestimates in slow tempo condition. This result also gives support to Ornstein's model (1969).

In the study of North, Hargreaves & Heath (1998), slow and fast tempo music were played during a gym session and participants were asked what the time was. The results showed that tempo did not affect the time perception of the participants in any way. On the other hand the participants in fast tempo condition did more accurate estimations on time than the participants in the slow tempo condition. In this case the reason of the results could have been because slow tempo music may be perceived as incompatible for the gym setting and it may distorted the time perception of the participants (North, Hargreaves & Heath, 1998).

Some other studies showed that fast tempo causes to overestimate the time duration. In the study that its findings support the storage-size memory model, participants waited in a queue about ten minutes with fast or no music background they overestimated the duration of the wait while in the slow music condition they underestimated the duration of the wait (Oakes, 2003).

North & Oakes (2006) created three identical 40-second long radio advertisements in order to understand the effects of musical tempo on time perception and memory. Since it was proposed that the tempo higher than 94 BPM is considered fast and where it is lower than 72 BPM is considered slow by Milliman (1982), they paired these audio only advertisements with fast tempo music (170 bpm) and slow tempo music (90 bpm) or no music at all. In the advertisements, there were a message and an offer about the product. After listening the advertisement participants were asked to estimate the duration of the advertisement and to recall some information about about it. According to results of the three group it has seen that tempo has no effect on the estimations of the duration length. However it has found that on the slow

tempo condition, participants were able to recall more information than in the other conditions. They also found that participants who heard the advertisement with no music have better recall than those who heard the advertisement with music. These results were non-coherent with the storage-size memory model's explanation (Ornstein, 1969) on time perception but however they supported the model's explanation of the effects of musical tempo on memory. There are several important limitations of North & Oakes's experiment. For example, one of the most important limitations could be the fact that they used marketing students as participants and this might be the reason that they have found no significant differences in duration estimations. It is likely that marketing students were aware of average duration of radio or TV advertisement is approximately 40 seconds long. This might be the cause of them to simply choose the duration instead of having to rely on their memory to estimate the length of the advertisement. Another limitation could be the unusual high tempo condition that they have used. Milliman (1982) has proposed the tempo higher than 94 BPM is fast and lower than 72 BPM is slow, similarly Kellaris & Rice (1993) has stated most music used in marketing studies are between 60 BPM and 120 BPM, it can be arguable that 170 BPM music might have been incongruent with the advertisement and have caused less content recall (Mailov, 2011).

1.2. TEMPORAL PERSPECTIVE

Three major aspects: succession, duration and temporal perspective compose psychological time (Block, 1990). Individual's time-related (temporal) experiences, behaviours and judgements compose time perception (Block & Zakay, 2001). Consecutive occurrence of events are perceived as temporal orders which is successiveness. Time periods or intervals form all the events which may be encoded and

remembered by the individuals refer duration. Lastly temporal perspective is refers to individual's time comprehensions and experiences (Block, 1990).

Temporal perspective contains interval length (duration) estimation and subjective passage of time judgements (Block, 1990). Subjective passage of time judgement is also defined as perceived speed of time passage by Wearden (2005).

Subjective appraisals of duration lengths refer to interval length (duration) estimates and the researchers frequently use verbal methods in order to interpret this subject such as requesting from participants to estimate the length of interval in minutes or seconds (Sucala, 2011).

Subjective passage of time judgement experiments do not contain any evaluations about the length of interval, focus of these experiments is to evaluate the speed of time passage (Sucala, 2011). In this kind of subjective time experiments, participants are asked to specify how quickly time seemed to pass during an event (Wearden, 2005).

1.2.1. Prospective vs. Retrospective Paradigms

Researches on time perception both on interval length estimation and perceived speed of time passage have contrast findings depending on how estimations are formed. Individuals can estimate about their temporal perspectives on two instructional conditions. First one is prospective paradigm and is defined as situation that participants are aware that they are going to make an estimation later on the experience and the second is retrospective paradigm and in this paradigm, participants aren't aware of upcoming estimations in the beginning of the event but they become aware after event is complete (Zakay & Block, 2004).

Prospective paradigm is explained with attentional models. (Zakay & Block, 1994) In this paradigm, participants use their attentional resources during the period by dividing them between temporal and non- temporal information. Temporal information

refers time- related, non-temporal information refers task-related information. (Sucala, 2011). As a result, when a task requires more non-temporal information processing, less attentional resources are used for examining temporal information and duration estimates becomes shorter (Zakay & Block, 1994) (Macar, Grondin, and Casini, 1994).

In order to perform retrospective time judgments, participant is asked to make a judgment and he/she tries to examine according to “storage size” process, it is about how much information need to be processed during the period and this means the greater amount of memory storage needed in period, gives longer time estimations (Wearden, 2005). This paradigm, alternatively concerns individuals’s remembrance of event durations (Kellaris & Mantel, 1996).

In 1992, a research has been performed that contains two activities with different difficulty levels such as sorting playing cards by their colors (A) and sorting same cards into more complex arrangement (B), activity A is easier than B and it is obvious that it requires less storage, in other word it has less “information processing”. After both tasks have proceeded and according to judgments from participants it seems that in general activity B produce longer estimations (Block, 1992).

Contextual- model of time is another approach in retrospective paradigm and it declares remembered duration expands depending on amount of codified contextual changes in memory (Zakay & Block, 1997). External changes and internal changes compose contextual changes in memory, external changes may occur in the event and internal ones are related to the participants such as related to state of mind, signification or cognitive strategies (Zakay & Block, 1994). All of these contextual changes originate a significant segment in a defined interval and when the event is full of processing loads, the level of time segmentation ascends depending on it, whereat participants remember this multi-segment time interval longer than unsegmented interval (Zakay & Block, 1997). It is also similar to filled versus empty time periods argument, where filled intervals have more information processing loads since there

are more changes in terms of segments (Zakay & Block, 1994).

1.2.2. Interval Length Judgments and Subjective Passage of Time Judgments

Temporal perception covers different time experiences as declared in previous part such as interval length (duration) estimation and subjective passage of time judgments, alternatively defined as the perceived speed of time passage (Block, 1990; Wearden, 2005).

1.2.2.1. Interval Length (Duration) Estimates

In the literature interval length estimation studies are the most common studies about subjective time perception and defined as the subjective evaluation of duration length (Sucala, 2010). Verbal estimation methods are used by researchers such as asking participants to estimate the length of a temporal interval in minutes or/and seconds (Block, 1990).

The study paradigm has a great importance in terms of study results as declared in the temporal perception part. There is a crucial distinction in any interval length estimate study depending on whether the study is focused on the retrospective paradigm or the prospective paradigm of time perception and contemporary time researchers point out that confusing these paradigms may occur fatal progress errors in the area (Zakay & Block, 1997; Wearden, 2005).

There are several factors that influence interval length estimates, one of the most important affecting factor is cognitive load meaning how cognitively demanding

a task is (Sucala, 2010). In the retrospective paradigm, the interval is estimated longer as the task is more difficult. Researchers use memory models that concern the amount of information or contextual changes included in an event (interval) and used for making estimation about the time related the interval (Ornstein, 1969; Block & Reed, 1978).

Ursavaş (2011) investigated the effects of tempo on time perception in his study, two version of the music was used for slow tempo the BPM was 70 and for fast tempo BPM was 140. Results showed that participants in fast tempo reported significantly longer duration estimates. This findings also supported the storage-size model.

Contradictory to the results of retrospective paradigm, the interval length estimations are shorter when the task is more difficult in the prospective paradigm. Attentional models are used to clarify the results of prospective paradigm declaring that when the task is difficult, participants devote their cognitive resources for task related information processing by choice so they have less cognitive resources for processing temporal information (Zakay & Block, 1997).

Apart from the cognitive load (task difficulty) there are other factors that affect the amount of attention devoted to temporal information. Zakay (1992) suggests that when the timing becomes important for an event, attention to time increases such as facing a deadline. Temporal relevance concept is defined by him as the “level of relevancy and importance of time dimension in a specific state required for the optimal adaptation to the external environment” (p.110), declaring that the interval length estimations are longer when the participants pay more attention with high temporal relevance (Zakay, 1992).

Nevertheless it is not precise whether the temporal relevance has the same effect on interval length estimates apart from the task difficulty and investigating these two

factors' (task difficulty and temporal relevance) interaction on interval length estimates would be important to have more information about temporal judgments (Sucala, 2011).

1.2.2.2. Subjective Passage of Time Judgments

Subjective passage of time judgment is described by Wearden (2005) as another type of subjective time experience. Length of interval is not estimated by participants in this experience but perception of the speed or perceived speed of time passage is estimated. On a Likert scale, participants are asked how quickly time seemed to pass during an event.

In Wearden's (2005) study it is shown that subjective passage of time judgments and interval length estimates are distinct time experiences. In this study, 9 minutes of the movie Armageddon is watched by a group of participants and the other group of participants waited in a "waiting room" condition for 9 minutes and after 9 minutes they were both asked to evaluate how quickly time seemed to pass. In the movie group, participants evaluated the passage of time faster than normal and "waiting room" participants evaluated the passage of time slower than actual 9 minutes. After that they were asked to read a novel for 10 minutes and when 10 minutes finish, they were asked to estimate the length of time interval spent watching movie or waiting room as a retrospective time judgment. The participants in movie condition estimated the time interval longer than the participants in the waiting condition. The passage of time seemed quickly for the participants in movie condition although retrospectively they estimated the interval longer because they stored more information from that interval (Wearden, 2005). This study shows that even though an interval can be retrospectively overestimated, time can seem to be as passing faster during that interval and these two time experiences (interval length judgment and subjective passage of

time) are separate experiences (Wearden, 2005; Sucala, 2010).

Studies on factors that influence subjective passage of time show that hedonic value of the task influences subjective passage of time judgments. More clearly if the participants sense a task as delighted, they sense the time passing faster in contrast if they sense the task boring or annoying time is perceived slower than normal (Watt, 1991; Sucala, 2010).

Researchers rarely investigate subjective passage of time judgment and interval length judgments in the same study with the same methodological conditions therefore it is not certain whether same variables affect them both or the nature of their relationship (Sucala, 2010).

1.3. HYPOTHESIS

This literature review shows that there are numerous studies investigating the effects of musical presence and musical tempo on time perception and they have produced conflicted results. Some studies have found a positive relationship between musical tempo and duration estimation whilst other have found negative or non-existent relationship. More over there is not enough research on effects of music in online shopping. The majority of the studies have investigated the effects of music on offline channels.

Time perception researches mostly suggest positive relationship between duration estimates and the amount of information processing (Ornstein, 1969; Block, 1990; Zakay & Block, 1996). According to these findings, an action with musical elements requires more information processing. Furthermore within the musical elements, fast tempo music (versus slow tempo music) contains more data (Oakes, 2003) and this makes the data more complex and the task heavier for listeners to

process.

Hypothesis 1: Participants in no music (versus with music) condition will report significantly shorter duration estimates.

Hypothesis 2: Participants in slow tempo (versus fast tempo) condition will report significantly shorter duration estimates.

The studies show that subjective speed of time judgments and duration estimations are two different time experiences. It is shown that even though an interval can be retrospectively overestimated, time can seem to be as passing faster during that interval (Wearden, 2005). Furthermore it is shown that hedonic value of the task influences subjective passage of time judgments. More clearly if the participants sense a task as delighted, they sense the time passing faster in contrast if they sense the task boring or annoying time is perceived slower than normal (Watt, 1991; Sucala, 2010).

Hypothesis 3: Participants in no music (versus with music) condition will report significantly slower speed of time judgments.

Hypothesis 4: Participants in slow tempo (versus fast tempo) condition will report significantly slower speed of time judgments.

Hypothesis 5: Participants who like the online activity (versus who did not like) will report significantly faster speed of time judgments.

Hypothesis 6: Participants who like the music they hear (versus who did not like) will report significantly faster speed of time judgments.

2. METHODOLOGY

2.1. PARTICIPANTS

One hundred and twelve participants (66 female and 46 male) from different age and educational background participated the study. The vast majority of the participants consist of 18-31 age range. %80,4 of the participants have bachelor and %13,4 of the participants have master degree background. %56,3 of the subjects reported that they are working actively. The distribution of age and educational background of the participants were shown below in Fig1 and Fig2.

Figure 1: Age distribution of participants

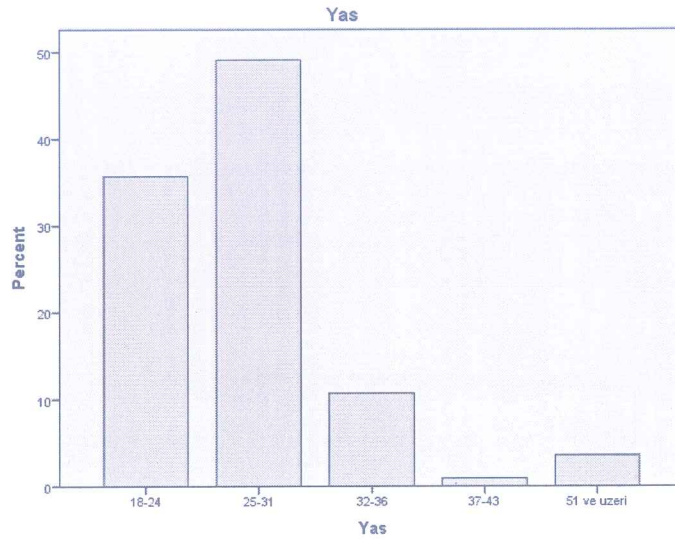
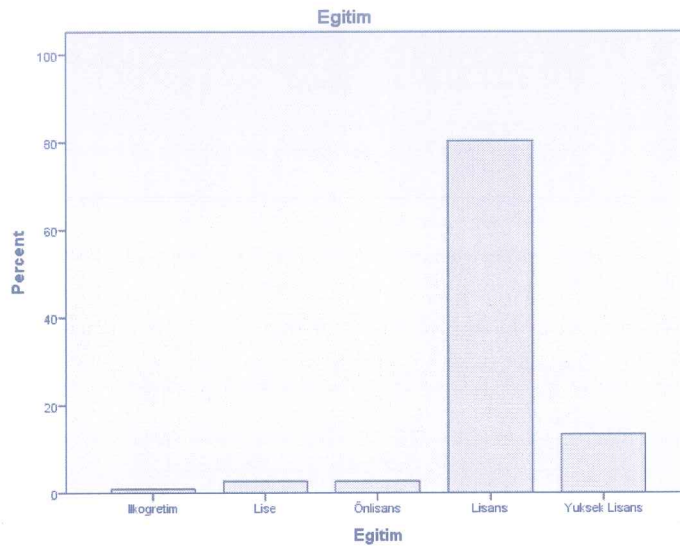


Figure 2: Educational background of participants



In order to understand participants' social media and online shopping tendency, two questions asked. One of them asked how many hours do the participants spend on social media in a day and the second asked how often do they shop online. Group has an intended level of social media usage and online shopping. Fig3 and Fig4 below, shows the percentages of the answers.

Figure 3: The average hours spending by participants on social media

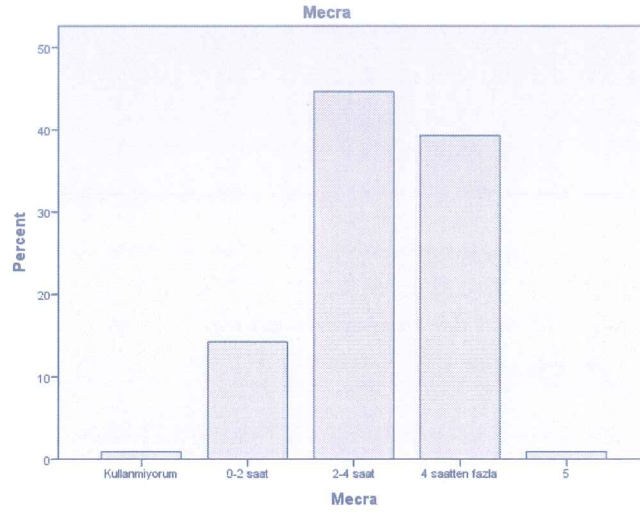
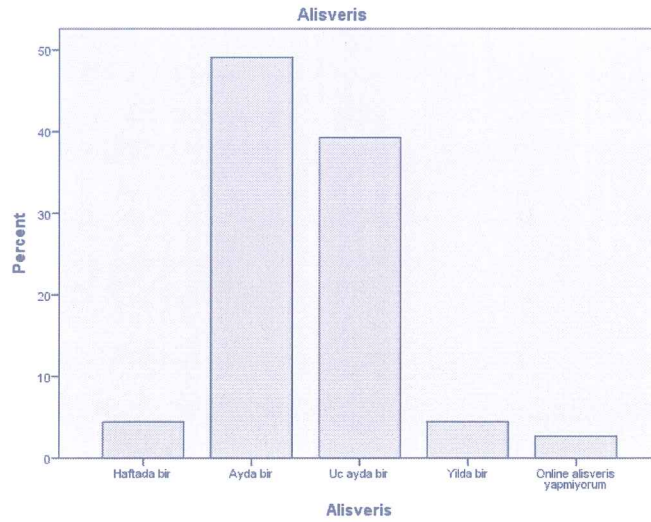


Figure 4: Online shopping tendencies of participants



2.2. DESIGN

This study was designed to test the effects of the presence of the music and musical tempo on participants' duration estimates and their subjective speed of time judgements during an online activity.

A fictional website called www.everythingnice.store was established. It is a common looking online shopping website which allows users to create their own designs on mugs, bags, water bottles and notebooks. There are numerous PNG designs for the users to choose and detailed explanation for each item such as materials, dimensions and price. The website also has About Us and Contact menus in order to give a sense of reality.

In order to test presence of music and musical tempo effects, three groups were formed. In the first condition participants were exposed to fast tempo music (120 BPM). In the second condition the music was exactly the same with first condition but the tempo of it was 60 BPM. The music was instrumental and last until the online activity ends. And in the third condition there was no music at all.

The procedure involved randomly assigning subjects to the treatments, spending personal time on the website while exposing them to musical stimulus (Condition 1 & Condition 2) and asking them to complete questionnaire.

Participants were told to examine and have a good time on the website. All the digital items that show time were not allowed and there was no time information on the laptops.

In order to calculate the actual duration of online activity the entrance panel was created and participants entered their given ID then choose the one link out of three according to their given group. The actual duration of the online activity started after the panel entrance and ended when the participant click on the BUY ITEM button.

After online activity, the questionnaire was given to the participants. In addition to demographic questions, participants were asked to estimate the speed of time on a 5 point Likert scale where 1 is time flew and 5 is time dragged. They were also asked to estimate the duration from the beginning to the end in terms of minutes or/and seconds. In order to understand hedonic and utilitarian values of the activity, 5 point Likert scale of Babin, Darden and Griffin 1994 Hedonic and Utilitarian Shopping Values asked. In order to understand of intension of the use of the website participants were asked on a 5 point Likert scale where 1 is definitely will not use the website and the 5 is definitely

will use the website and lastly music preference question was asked to the participants were exposed to music on a 5 point Likert scale where 1 is definitely do not like the music and 5 definitely like the music.

Subjects were exposed to the treatment one by one or in a small groups on properly functioning laptops and whole data collecting procedure took about 7 days.

2.3. DEPENDENT VARIABLES

2.3.1. Subjective Passage of Time

Studies that investigate the subjective passage of time usually use the verbal declaration of subjects in order to measure their subjective time/speed perception. In his 2005 study, Wearden asked participants that how quickly time seemed to pass on a 5 point Likert scale where 1 is time flew and 5 is time dragged (Wearden, 2005). The present study also used the same scale in order to measure participants' subjective passage of time judgements. The instructions read: "How fast was the time for you from the beginning of the activity to the end of the activity? Please select the option that suits you best."

2.3.2. Duration Estimation

Most of the research about perceived duration measure duration estimates by simply asking participants the estimation with blank spaces in terms of minutes and seconds (Block, 1990; Kellaris & Mantel, 1994 & 1996). Nevertheless this might cause the participant to round up their estimations (Oakes, 1999, 2003). The present study measured the participants' duration estimates by using blank spaces with minutes and seconds but specifically stated minutes and/or seconds. The instructions read: "How

long did your activity last from logging in to site until you clicked on BUY ITEM button? (You can specify in mminutes and/or seconds).”

2.3.3. Hedonic and Utilitarian Shopping Values

In order to understand the hedonic values of the online activity, Hedonic and Utilitarian Shopping Values Scale of Babin, Darden and Griffin 1994 was used and the statements have been adapted according to the present study. The scale was 5 point Likert scale where 1 is definitely do not agree, 2 is partly disagree, 3 no idea, 4 partly agree and the 5 is definitely agree.

2.3.4. Intention to Use

Although no hypothesis was produced on the relationship between time-related judgements and participants’s intention to use of the website an intention to use scale was added to questionnaire for exploratory reasons. The scale was 5 point Likert scale where 1 is definitely will not use this website, 2 is probably will not use this website, 3 I may use this website, 4 probably will use this website and 5 definitely will use this website.

2.3.5. Acclaim of Music

In order to measure subjects’ acclaim of music, participants were asked to define how much do they like the music on the website, on a 5 point Likert scale where 1 is definitely did not like it at all, 2 is did not like it, 3 is I feel nothing, 4 is liked it and 5 is definitely did like it. The instructions read: “How much do you like the music you heard? Please select the option that suits you best.”

3. ANALYSIS

3.1 RELIABILITY TESTS

In order to test the statements of hedonic and utilitarian values scale, reliability test was conducted. Item 11 requires reverse scoring therefore variable recoded into different variable as H11_R (TERS). Below in the Table 1, total reliability statistics are shown.

Table 1: Reliability Statistics for Hedonic Value Items

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|-------|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| H1 | 40,51 | 50,847 | ,816 | ,867 |
| H2 | 40,69 | 47,550 | ,898 | ,857 |
| H3 | 41,26 | 45,437 | ,682 | ,868 |
| H4 | 40,49 | 51,423 | ,788 | ,868 |
| H5 | 40,72 | 47,031 | ,886 | ,856 |
| H6 | 40,78 | 48,986 | ,803 | ,863 |
| H7 | 40,64 | 49,637 | ,767 | ,865 |
| H8 | 40,86 | 47,133 | ,803 | ,860 |
| H9 | 42,30 | 50,592 | ,307 | ,903 |
| H10 | 40,96 | 47,070 | ,802 | ,860 |
| H11_R | 40,97 | 59,468 | -,094 | ,925 |

The Cronbach's Alpha is ,884 which is fairly good because we would like to have it closer to 1 and best scenario is between ,700 and 1. At first appearance, this table seems acceptable but to improve the reliability scores, H9 and H11_R(TERS) items could be deleted. The deleted version of these two items is shown below in Table 2.

Table 2: Reliability Statistics for Hedonic Values Items (if two items deleted)

| | Cronbach's Alpha | N of Items |
|--|------------------|------------|
| | ,947 | 9 |

| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
|-----|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| H1 | 33,75 | 41,162 | ,831 | ,941 |
| H2 | 33,93 | 38,247 | ,906 | ,934 |
| H3 | 34,50 | 36,432 | ,677 | ,954 |
| H4 | 33,73 | 41,603 | ,814 | ,942 |
| H5 | 33,96 | 37,764 | ,894 | ,935 |
| H6 | 34,02 | 39,243 | ,840 | ,938 |
| H7 | 33,88 | 40,158 | ,770 | ,942 |
| H8 | 34,10 | 37,657 | ,828 | ,938 |
| H10 | 34,20 | 38,015 | ,789 | ,941 |

It is seen that after deleting H9 and H11_R(TERS), Cronbach's Alpha increase ,947 and even though deleting of H3 also makes increasing on Alpha, we did not delete H3 since present statistics are have good acceptance level for reliability tests.

Likewise there are 4 items for utilitarian values. U2 and U4 require reverse scoring therefore variables recoded into different variables as U2_R(TERS) and

U4_R(TERS). Table 3 below shows the reliability statistics for utilitarian values.

Table 3: Reliability Statistics for Utilitarian Value Items

| | | Cronbach's Alpha | N of Items | |
|------|----------------------------|--------------------------------|----------------------------------|----------------------------------|
| | | ,649 | 4 | |
| | Scale Mean if Item Deleted | Scale Variance if Item Deleted | Corrected Item-Total Correlation | Cronbach's Alpha if Item Deleted |
| U1 | 12,31 | 8,289 | ,319 | ,648 |
| U2_R | 12,52 | 5,153 | ,598 | ,441 |
| U3 | 12,34 | 8,172 | ,330 | ,642 |
| U4_R | 12,33 | 5,827 | ,503 | ,526 |

The Cronbach's Alpha for utilitarian reliability test is ,649. Since we are looking Alpha to be between ,700 and 1, utilitarian Cronbach's Alpha is not on the good level as hedonic reliability test. When the table is investigated, it seems deleting none of the item would increase the Alpha so no further change was made.

The reason for low Alpha may be because of the value statements being overthought by the participants. The statements focused on the need and desire level of the products. Although participants enjoy and like the online activity, they might think that the products were not their actual needs.

3.2. ANOVA ANALYSIS

The present study investigates the effects of presence of music and musical tempo on subjects' time perception as explained in previous chapters. In order to examine the effects, three groups were formed, first group spent their time on the

fictional website by exposed to fast tempo music (120 BPM) and this group has 39 participants. Second group did the same activity with the same music but in slow tempo (60 BPM) and this group has 43 participants. Lastly the third group had no music in background while spending time on the same fictional website and there are 30 participants in the third group.

The aim of the study is to investigate the duration estimations and speed of time judgements by these three groups and to calculate more than two different groups' means Analysis of Variance (ANOVA) analysis is required to be done. Oneway Anova analysis was done for understanding if there is significantly difference between these three groups. Below, Table 4 shows the descriptives values and Table 5 shows the results of the homogeneity tests.

Table 4: Descriptives table for three groups

| | | N | Mean |
|-----------|---------|-----|--------|
| Speed | Fast | 39 | 2,28 |
| | Slow | 43 | 3,02 |
| | No mus. | 30 | 3,43 |
| | Total | 112 | 2,88 |
| Duration | Fast | 39 | 259,13 |
| | Slow | 43 | 145,93 |
| | No mus. | 30 | 109,33 |
| | Total | 112 | 175,54 |
| Actual D. | Fast | 39 | 194,72 |
| | Slow | 43 | 194,14 |
| | No mus. | 30 | 215,77 |
| | Total | 112 | 200,13 |

From the Descriptives table, it is seen that the means of Actual Duration of the activity for fast tempo and slow tempo conditions are close and no music condition is longer than the other groups. The verbal estimation of the duration means seem to be longest for fast tempo condition and shortest for no music condition. And lastly, speed of time judgments seem to be fastest in fast tempo condition and slowest in no music condition. But in order to understand if there is a significant difference between the three groups, the Anova results need to be investigated.

Table 5: The results for the Test of Homogeneity of Variances

| | Levene Statistics | df1 | df2 | Sig. |
|---------------------|-------------------|-----|-----|------|
| Speed | ,212 | 2 | 109 | ,810 |
| Duration | 1,744 | 2 | 109 | ,180 |
| ActualD | ,594 | 2 | 109 | ,554 |
| Difference Duration | ,240 | 2 | 109 | ,787 |

In order to accept the homogeneity the Sig. Value needs to be higher than 0,05 and as seen above in the Table 5, all Sig. values are higher than 0,05 therefore we accept the homogeneity of variances.

In the Table 6, Anova results are shown for the three groups. In order to accept the difference between the groups, we are looking the Sig. values for each variable and expect this value to be equal or lower than ,005.

Table 6: Anova results for three groups

| | Sum of Squares | df | Mean Square | F | Sig. |
|-------------------------|----------------|-----|-------------|--------|------|
| Speed Between Groups | 24,009 | 2 | 12,005 | 13,319 | ,000 |
| Within Groups | 98,241 | 109 | ,901 | | |
| Total | 122,250 | 111 | | | |
| Duration Between Groups | 441691,960 | 2 | 220845,980 | 5,525 | ,005 |
| Within Groups | 4357305,816 | 109 | 39975,283 | | |
| Total | 4798997,777 | 111 | | | |

According to the Anova results, it is found that there is a significant difference in speed ($p=.000$) and duration estimation ($p=.005$) values between the three groups.

In order to understand which groups are significantly different there are another analysis to be conducted. Post-Hoc tests need to be analyzed for further investigations. In the present study sample sizes are not identically equal therefore Games-Howell test was chosen for further analysis.

Table 7: Games-Howell Multiple Comparisons table for three groups

| | | | Sig. |
|----------|------------|------------|------|
| Speed | Fast Tempo | Slow Tempo | ,002 |
| | | No music | ,000 |
| | Slow Tempo | Fast Tempo | ,002 |
| | | No music | ,191 |
| | No music | Fast Tempo | ,000 |
| | | Slow Tempo | ,191 |
| Duration | Fast Tempo | Slow Tempo | ,083 |
| | | No music | ,005 |
| | Slow Tempo | Fast Tempo | ,083 |
| | | No music | ,445 |
| | No music | Fast Tempo | ,005 |
| | | Slow Tempo | ,445 |

As seen in Table 7, there is a significant difference in Speed variable between fast and slow tempo ($p=.002$) and fast tempo and no music conditions ($p=.000$). Therefore H4 “Participants in slow tempo (versus fast tempo) condition will report significantly slower speed of time judgments.” is supported. More specifically subjects

who listened slow tempo music declared their speed of time judgments slower ($M=3.02$) than who listened fast tempo music ($M=2.28$).

Slow tempo condition also significantly differs from fast tempo condition ($p=,002$) but does not significantly differ from no music condition ($p=,191$).

No music condition also significantly differs from fast tempo condition ($p=,000$) but does not significantly differ from slow music condition ($p=,445$).

There is a significant difference in Duration Estimation variable between fast tempo and no music condition ($p=,005$) but there is no significant difference between fast tempo and slow tempo condition ($p=,083$) according to Figure 11.

Also there is no significant difference between slow tempo and fast tempo condition ($p=,083$) and no music condition ($p=,445$). Therefore H2, "Participants in slow tempo (versus fast tempo) condition will report significantly shorter duration estimates." was rejected.

Lastly, no music condition significantly differs from fast music condition ($p=,005$) but does not significantly differs from slow music condition ($p=,445$).

3.3. T-TEST ANALYSIS

In order to investigate if there is a significant difference between two independent groups T-Test is required to be done. First T-Test was conducted to analyse the presence of music (with music group and without music group), in order to do that a new variable was created with the name MusicPresence and coded 1 if the participant is from with music condition and 0 if the participant is from no music condition. Then T-Test is conducted. Table 8 and Table 9 shows the results of the test below.

Table 8: Group Statistics for T-Test

| | Music Presence | N | Mean | Std. Deviation | Std. Error Mean |
|----------|----------------|----|--------|----------------|-----------------|
| Speed | 0 | 30 | 3,43 | ,971 | ,177 |
| | 1 | 82 | 2,67 | 1,007 | ,111 |
| Duration | 0 | 30 | 109,33 | 49,615 | 9,058 |
| | 1 | 82 | 199,77 | 236,955 | 26,167 |
| ActualD | 0 | 30 | 215,77 | 129,825 | 23,703 |
| | 1 | 82 | 194,41 | 197,096 | 21,766 |

Table 9: Independent Samples Test Results for two groups

| | | F | Sig. | Sig. (2-tailed) |
|----------|-----------------------------|-------|------|-----------------|
| Speed | Equal variances assumed | ,675 | ,413 | ,001 |
| | Equal variances not assumed | | | ,001 |
| Duration | Equal variances assumed | 4,502 | ,036 | ,041 |
| | Equal variances not assumed | | | ,002 |

As seen in Table 8, 30 participants were in no music and 82 participants were in with music group.

In Table 9, first of all the Sig. values of Levene's Test for Equality of Variances need to be checked and these values need to be bigger than 0,05 in order to accept that they have equal variances. If the values are bigger than 0,05 then the first line of Sig. (2-tailed) column will be checked and if they are smaller then the second line of Sig. (2-tailed) column will be checked. In Speed variable Levene's Sig. value is bigger 0,05 therefore we looked the first line of Sig. (2-tailed) and it is seemed to be smaller than ,005 ($p=,001$) so we accept that there is a significantly difference between no music and with music condition in Speed value. Therefore H3, "Participants in no music (versus with music) condition will report significantly slower speed of time judgments." was supported. More specifically, participants in no music condition

declared slower speed of time judgments (M=3,43) than the participants in with music condition (M=2,67).

For the Duration Estimation variable Levene's Sig. value is smaller than 0,05 therefore we need to check second line of Sig. (2-tailed) column, this value is smaller than 0,005 as well (p=,002). Therefore there is a significant difference between these two group on Duration Estimation value and H1, "Participants in no music (versus with music) condition will report significantly shorter duration estimates." was supported. More specifically, participants in no music condition reported shorter duration estimates (M=109,33) than the participants in with music condition (M=199,77).

The second Independent T-Test was conducted for investigating if there is a significant difference between hedonic group and non hedonic group. A new variable was formed with the name of HedonicGroup and coded 1 if the participant's hedonic scored mean value is 4 or 5 (as hedonic group) and coded 0 if the participant's hedonic scored mean is 1 or 2. (as non hedonic group). The participants (9 participants) who scored 3 (no idea) were not added to the analysis. Then T-Test was conducted, below in the Table 10, and Table 11, results are shown.

Table 10: Group Statistics for second T-Test

| | Hedonic Group | N | Mean | Std. Deviation | Std. Error Mean |
|-------|---------------|----|------|----------------|-----------------|
| Speed | Non Hedonic | 4 | 3,00 | 1,155 | ,577 |
| | Hedonic | 99 | 2,86 | 1,079 | ,108 |

As seen in Table 10, 4 participants were in the non hedonic group and 99 participants were in the hedonic group.

Table 11: Second Independent Samples Test Results for two groups

| | | F | Sig. | Sig. (2-tailed) |
|-------|-----------------------------|------|------|-----------------|
| Speed | Equal variances assumed | ,080 | ,779 | ,798 |
| | Equal variances not assumed | | | ,824 |

In Levene's Test for Equality of Variances table, Sig. value for Speed is bigger than 0,05 ($p=,779$) so it is assumed to have equal variances. Since the Sig. value is bigger than 0,05 first line of the Sig. (2-tailed) is need to be checked. Sig. (2-tailed) value for Speed is bigger than ,005 ($p=,798$) therefore there is no significant difference between two groups. Thence H5, "Participants who like the online activity will report significantly faster speed of time judgments." was rejected.

The third Independent T-Test was conducted in order to investigate H6, "Participants who like the music they hear (versus who did not like) will report significantly faster speed of time judgments." The new variable was formed and recoded 1 if they liked music on a score 4 or 5, and recoded 0, if they did not like music on a score 1 or 2. The participants (28 participants) who scored 3 (no feelings toward music) and the participants in no music condition (30 participants) were not added to the analysis. Then T-Test was conducted and the results are shown below in Table 12 and Table 13.

Table 12: Group Statistics for third T-Test

| | Like Music | N | Mean | Std. Deviation | Std. Error Mean |
|-------|--------------------|----|------|----------------|-----------------|
| Speed | Did Not Like Music | 16 | 3,06 | ,854 | ,213 |
| | Liked Music | 38 | 2,21 | ,991 | ,161 |

As seen in Table 12, 16 participants did not like the music they heard and 38 participants liked the music.

Table 13: Third Independent Samples Test Results for two groups

| | F | Sig. | Sig. (2-tailed) |
|-----------------------------|------|------|-----------------|
| Speed | ,773 | ,383 | ,004 |
| Equal variances assumed | | | |
| Equal variances not assumed | | | ,003 |

In Levene's Test for Equality of Variances table, Sig. value for Speed is bigger than 0,05 ($p=,383$) so it is assumed to have equal variances. Since the Sig. value is bigger than 0,05 first line of the Sig. (2-tailed) is need to be checked. Sig. (2-tailed) value for Speed is smaller than ,005 ($p=,004$) therefore there is significant difference between two groups. Thence more specifically H6, "Participants who like the music they hear (versus who did not like) will report significantly faster speed of time judgments." was supported. (liked $M=2,21$) (did not like $M=3,06$).

RESULT

The experiment was conducted with 112 participants in three groups, fast tempo condition, slow tempo condition and no music condition. Participants experienced a fictional online shopping website and were asked to create a product according to their personal interests. Then a questionnaire was applied including the questions about the duration estimation, speed of time judgment, hedonic interest and music preference. After the data collection all the data was transformed to SPSS and statistical analyses were done.

The statistical analyses of the data showed that four of the six hypotheses of this study were supported. In respect of the results about presence of music it is seen that participants in no music condition reported shorter duration estimates ($M=109,37s$) than the participants with music condition ($M=199,77s$), when the actual duration mean for the no music group was 215,77s and for the group with music was 194,41s.

Therefore these findings support the storage size model of Oakes (2003), where the participants who heard the music while doing the online activity used their “memory storage” more than the participants in no music group, since the condition with music was a more complex period than the without music condition. In connection with the subjective speed of time judgment and the presence of music, the results showed that participants in no music condition reported slower speed of time judgments than the participants with music conditions. This result might support the research Sucala (2010), that says time flies when you expect to have fun, since all the participants were conducted the same activity with different music conditions.

In respect of the results about musical tempo’s effect on duration estimates and speed of time judgments, the results showed that participants reported slower speed of time judgments than the participants in fast tempo condition. But reversely, the results showed that there is no significant difference between fast and tempo conditions about duration estimations. As opposed to storage size model, this result was unexpected since when the tempo increases the more information needs to be stored in subjects’ storage.

In order to investigate a support for the previous research (Watt, 1991; Sucala, 2010) the effect of hedonic value was measured but surprisingly the results showed that there is no significant difference between hedonic and non hedonic participants’ subjective speed of time judgments. This could be because of the people who reported high hedonic value for the activity were 99 and non hedonic ones were only 4 participants.

Lastly the hedonic value towards the music was investigated and in this analysis only the participants who heard the music were added to the analysis and the results showed that participants who liked the music they heard reported faster speed of time judgments than the participants who did not like the music.

The results of the present study do not replicate completely the most common findings reported in the past especially about the musical tempo effects on duration estimations and the storage size model (Oakes, 2003; Oakes & North, 2006). But it also

supported the storage size model with the effects of the presence of the music, when the condition with music assumed more complex than the condition without music, it is supported that the more difficult the task is the longer the temporal interval is estimated (Ornstein, 1969; Block & Reed, 1978; Sucala, 2010). Reversely, the results about subjective speed of time judgments may show new findings on the variables that affect subjective speed of time judgment. Because of the previous research have suggested that this type of judgment is affected by the hedonic value of the task, even though in this study the hedonic value of the task was high, no significant difference was found in terms of speed of time judgments, regarding to the very low number of participants that reported they did not like the task, it is found that presence of the music, musical tempo and the hedonic value towards the music affected the subjective speed of time judgment.

The results of the present study can be used for the marketers and the brands in order to manipulate the consumers's subjective speed of time judgments. For example for the online sales channels, the music player could be entegrated to the website or a Spotify list which is created by the brand (in order to define brand identity for branding) full of musical tracks with the fast tempo could be shared with the consumers. By the way when the customer is surfing on the website to shop an item or search for a service could feel the time seems to pass faster and could find what she/he wants faster then the actual time. Even though an automatic music player could be annoying for the people, it could be better to put it on a permission. Creating Spotify music lists could be better and more modern option for the brands who want to analys the musical tempo effects. Weekly playlists, special day playlists can be created and served to customers not only for online sales channels but also for content marketing, e-mail marketing and for social media management.

By the way, customers who listen to selected playlists on the brand's online channels would be entegrated with the brand while listening to music and the illusion of the time passing faster could be created.

According to these results, the companies can use the effect of musical tempo and hedonic values towards to music while they would like customers to fill a form or a survey. Since filling a form can be found long and boring by the customers, to expose a fast tempo music with the forms and the surveys could make an effect for the customers to realize time seems to pass faster.

Although the main use for the results are considered for the online channels for the brands such as websites, newsletters, content sharing channels etc. the results can also be used in the fields that is accepted boring by the consumers such as bank and post office ATMs, telecommunication, transportation or any other kind of kiosks in order to affect consumers' time perception with the effect of presence of music and musical tempo.

LIMITATIONS

In this study, one of the research subject was the effects of the hedonic value of the task on consumer's time perception but according to given answers of participants, only 4 of the total participants did not like the experimental activity hence results of this not reliable. For further research, it could be more effective to use semi fun activity and also it has to be noted that participants may have answered the question incorrectly.

In order to understand if the findings are valid for other consumer profiles, the experiment has to be done with participants from different backgrounds such as age, education, profession and area etc.

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