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# The Influence of Music on Online Shopping Behaviour

Jessmyn Cabigas
*King's University College*

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by

Jessmyn Cabigas

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Department of Psychology

King's University College at Western University

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Thesis Advisor: Dr. Donald Gorassini

## Abstract

The purpose of this study was to identify the possible effects of background music on online consumer behaviour. Research has examined influence of music on various in-store consumer behaviours including time spent in store and total dollar amount in sales (Milliman, 1982; Milliman; 1986). If and how music alters consumer behaviour in the online setting has not been widely investigated despite the increasing popularity of online stores. Based on relevant theory and research in physical commercial settings, it was predicted that music, as opposed to no music, would result to higher positive affect experienced and increased time spent in an online store. It is also predicted that low-tempo music, compared to no music, would produce more thorough product evaluations. 210 participants engaged in a timed online shopping simulation after being randomly assigned to three conditions: no music, slow-tempo music (72 bpm) and fast-tempo music (120 bpm). Shopping consisted of the perusal of features of each of five different headphones. Afterward, participants completed a series of surveys that measured their evaluations on the products, likelihood of purchase, and shopping-related affect and involvement. Although participants carefully and successfully chose the headphone set with the most superior features, less time was taken to do so when fast tempo music than in no-music control; with slow-tempo music falling in between. In short, the fast tempo music led to more efficient evaluation. Theoretical and practical implications of these findings are discussed.

# The Influence of Music on Online Shopping Behaviour

Research has demonstrated that various components of store environments affect consumer behaviour. The stimuli include product information and background features such as tone of paint and lighting (Tantanatewin & Inkarojrit, 2016), ambient store fragrance (Morrin & Ratneshwar, 2003), and background music (Milliman, 1982; Milliman, 1986). Background music, the focus of the present paper, has been shown to affect two types of consumer behaviour: product preference (Gorn, 1982), the act of choosing one product over another, and shopping (Milliman, 1982; Milliman, 1986), individual behaviours performed in stores for the purpose of purchasing products. In this paper, it is the latter that is addressed. Notably, background music can significantly extend time spent in store (Milliman, 1982; Milliman, 1986) and increase dollar amount spent by patrons (Milliman, 1982; Milliman, 1986). Almost all research exploring the impact of background music on consumer conduct has been conducted in physical stores located in laboratory or field settings. The effects of background music on online consumer behaviour, on the other hand, have not been widely examined despite the increased popularity of online stores. In Canadian households alone, 76% of the population shop online (Canada Post, 2018). That being the case, this experimental study explores the potential impact of background music on online consumer behaviour, specifically on time spent shopping, quality of product assessment, task involvement, and customer affect.

## How Music Might Affect Online Consumer Conduct

Several theories suggest that background music could influence consumer behaviour in an online shopping context. First, a classical conditioning explanation proposes that a reflexive

positive evaluation of an unconditioned stimulus, music, would transfer to a previously neutral stimulus, the product. Second, an operant conditioning explanation suggests that music makes the shopping environment pleasant and consequently increases time spent in the store. Third, priming, wherein the presence of a retrieval cue (in this case, music) activates mental content related to a product decision, could be pertinent. Finally, the elaboration likelihood model of persuasion suggests how music could influence decision making via the peripheral route to persuasion.

## Associative Learning

**Classical conditioning.** In a model based on classical conditioning, music would be considered an unconditioned stimulus capable of eliciting an evaluation. If the music is positive, the listener would experience unconditioned responses such as pleasure, liking for the piece, and a desire to hear it again. Presenting a neutrally evaluated stimulus along with the music would result in that object or event eliciting responses resembling those occurring in response to the unconditioned stimulus. In other words, the object or event gains the capacity to arouse pleasure and positive evaluation and thus goes from being a neutral to a conditioned stimulus. Crucially, the pleasure and positive evaluations aroused by the conditioned stimulus are attributed to the conditioned stimulus, thus raising its value in a purchase decision.

Gorn (1982), for instance, found that a product (neutral stimulus) paired with liked music (unconditioned stimulus), compared to one paired with disliked music, was more often chosen by participants. Gorn (1982) proposed that this effect typically happens when participants are not in a decision-making mode, meaning, they are not paying careful attention to product attributes. However, other researchers failed to replicate Gorn's (1982) findings. Kellaris and Cox (1989)

found that the association between level of music appeal and degree of product preference was not significant. Kellaris and Cox (1989) criticized Gorn's (1982) procedures as facilitating demand artifacts in participants. Particularly, Gorn (1982) informed participants what the purpose of his study was beforehand (i.e., to select the music that would best fit an ad). Hearing this, participants in the study acted accordingly, thus giving rise to a spurious set of results.

As both studies mentioned above presented contradictory results, it is the hope of the present study to explore how, if at all possible, classical conditioning is implicated in the relationship between background music and evaluation of paired stimuli. This can be done by decreasing the likelihood of inducing demand in the procedure of the study in that the general purpose of the study by omitting any mention of the anticipated role of background music and by imposing a manipulation of music tempo in a between-subjects design.

**Operant conditioning.** Based on the principles of operant conditioning, pleasant music could serve as a reinforcer whereas unpleasant music could serve as punishment. Online shopping might itself be reinforced with pleasant music and punished with aversive music. Shoppers might shop longer in a pleasant setting but shop for less time in an unpleasant setting. Along these lines, Milliman (1982) found that soft-tempo music increased alcohol sales in a bar. He attributed this to the relaxing mood created in customers. As evidence that the rewarding affect generalized to drinking behaviour, alcohol consumption increased. By the same reasoning, aversive music would be expected to reduce time devoted to shopping. To illustrate, Smith and Curnow (1966) found that when background music was uncomfortably loud, a store's total sales and time spent in store was negatively affected. In this context, music serves as punishment for shopping and, therefore, reduces the likelihood of individuals browsing and buying products.

Operant conditioning principles suggest how elements of music could increase or decrease online consumer behaviour. Based on this explanation, it was expected in the present study that the pleasant music used would increase the amount of time spent shopping. Whether this would enhance or diminish thought quality–detecting the superior set of headphones planted in a group of five–was an interesting question. The elaboration likelihood model would suggest two possibilities. Extra time could improve central route processing–the more time spent on task, the greater the opportunity to read and benefit from information contained in product feature lists. Extra time might add little to thought quality if participants were uninvolved in the issue. The decision would be made strictly on the basis of the peripheral cue, pleasant music. The design of the present study made it possible to distinguish these processes.

**Priming**

Another way music's effect on online consumer behaviour can be explained is through priming. According to a priming explanation, a retrieval cue that activates one concept will, soon after, activate associated concepts in the person's memory. The word "bread" would for many also activate "loaf" and "butter." Thus, music could operate as a retrieval cue to concepts that could, once activated, drive consumer cognition and behaviour. For example, Jacob (2006) found that when drinking songs were played in the background (as opposed to Top 40 music or cartoon music), participants stayed longer in a bar and spent more money on alcoholic beverages. Jacob (2006) used priming to explain this result. Drinking songs are "traditionally associated with alcohol consumption and friendliness" (p. 719). By playing drinking songs in bars, bar owners are able to prime positive feelings and affiliative tendencies in their customers. These could increase time spent in the bar and amount spent on alcoholic beverages.

Although not necessarily citing priming as an explanation, MacInnis and Park (1991) stated that music *indexicality* (i.e. music that is familiar and reminds individuals of a past memory) affects consumer behaviour by affecting consumer's emotions and ad attitudes. This effect is especially seen when involvement is low—when participants were not paying close attention to the ad's message. For example, in the study done by MacInnis and Park (1991), the song "You Make Me Feel Like a Natural Woman," proposed to have high indexicality, was used for a natural shampoo ad. This significantly increased positive emotions and, consequently, increased positive attitudes toward the ad (MacInnis & Park, 1991). This was most pronounced in a low involvement condition. Briefly, the impact of background music and consumer behaviour could be due to priming. When the background music activates concepts relevant to consumer behaviour in memory, a corresponding effect on consumer affect can be expected.

**Elaboration Likelihood Model**

Music can also affect consumer decision making by impacting on quality of product evaluation. The elaboration likelihood model posits two routes to persuasion—peripheral and central—and proposes that an individual's cognitive, affective, and behavioural responses depend on the route used (Petty and Cacioppo, 1986). If peripheral, the individual decides on acceptance versus rejection of a message by using surface cues (e.g., attractive model, source credibility) to inform simple decision rules. If central, the individual gathers considerable information and reasons carefully, that is to say engages in a high-quality assessment.

The individual's motivation and ability to process the information determines the route used (Petty and Cacioppo, 1986). If both the ability and motivation are high, the central route of persuasion is used. If either ability or motivation is low, the peripheral route of persuasion is used

(Petty and Cacioppo, 1986). In relation to the present study, it is suspected that background music may either distract customers from the issue-relevant information or increase elaboration by increasing issue involvement (e.g., music taken as a sign of store quality and the worthiness of its products).

**Peripheral route of persuasion.** Playing background music might decrease motivation or ability of customers to process product details, which are essential to informing decisions about a purchase. Additionally, background music may act as a peripheral cue by influencing the direction of a decision of consumers already in a low involvement state. In other words, when an individual does not process information carefully, persuasion may be dependent on peripheral cues in the environment (i.e., the pleasant versus aversive quality of background music).

For example, in the study done by Park and Young (1986), for individuals high in motivation to process a persuasive message, background music served as a distraction preventing them from processing the information properly. The researchers stated that when individuals are distracted, manipulating their moods through music can greatly affect their brand evaluations. For instance, if they are put in a sad mood, they are less likely to have favourable brand evaluations whereas if they are in a positive mood, they are more likely to have favourable brand evaluations (Park & Young, 1986).

Another way background music can direct consumer behaviour is by manipulating individuals' pleasure and arousal. Yalch and Spangenberg (2000) found a positive relationship between pleasure and product evaluation and a negative relationship between arousal and product evaluations. If playing background music increases customers' pleasure and decreases customers' arousal, it is likely that products sold will be rated more highly.

These are examples of the high motivation-low ability instances. Even if motivated, individuals must take the peripheral route if they are unable to process the message and the presence of background music in these circumstances could act as a cue to message persuasiveness. It is also possible that background music does double duty by preventing ability and acting as a persuasive cue. When music is used as a persuasive cue, the ability to evaluate the product and the option to walk away from the product is eliminated. Music, then, limits individual's choices by singling out persuasion as the only choice left.

**Central route of persuasion.** Although it may be true that playing background music influences the decision-making process of consumers who are less involved, environmental stimuli including background music conveys information and therefore could impact substantive message processing (Petty & Cacioppo, 1986). The music may contain information that adds to the issue-relevant knowledge explicitly provided. In this respect, background music may support and increase the ability for information processing in those who are highly motivated.

Background music may also promote issue involvement. MacInnis and Park (1991) explained that music, especially music that matched the message portrayed by the ad, facilitated consumer's attention to the message. The greater the attention paid to the message, the more likely consumers came to believe message-borne assertions (MacInnis & Park, 1991). This shows that background music is capable of increasing compliance in consumers not only through the peripheral route but also through the central route and the effect can be determined either by information provided or amount of processing promoted.

To illustrate, in a study by Areni and Kim (1993), different types of music were played in a wine store. It was found that customers were more likely to purchase expensive wines when

classical as compared to Top-40 music were played. Areni and Kim (1993) argued that although it is possible that background music may serve as a distraction and compelled customers to buy more expensive wines, they also acknowledged that the classical background music may have also sent the message to the customers that the wines sold are high-class and sophisticated. Not only then does background music act as a peripheral cue, it may also act as another element of issue-relevant information for consumers.

Music could influence issue involvement by its tempo: slow tempo music might prompt increased scrutiny of information whereas fast tempo music might promote more rapid and less scrutiny of information. When people are given time to scrutinize information, there is an increased chance for a quality decision. This means that background music may act as "deliberation support" (Gorassini, 2017) that leads individuals to process information more carefully, free from distractions. Particularly, Milliman (1982, 1986) found that when slow-tempo background music was played, individuals stayed longer in a store. He also found that the pace of traffic in the store was slow as well (Milliman, 1982). Knowing this, one would expect that slow tempo background music allows central route product evaluation by increasing individual's attention to product details.

To summarize, in accord with a model first proposed by Mehrabian and Russell (1974), altering the environment within a store can have a significant impact on consumer behaviour. Playing background music, one such environmental variable, has been repeatedly shown to impact consumer decision-making and behaviour (Milliman, 1982; Milliman, 1986; etc.).

## The Current Experiment

This study investigates how music affects consumer behaviour in the online setting. As mentioned earlier, e-commerce has increased in popularity. In 2010, Canadians purchase 10 orders, on average, per person (Statistics Canada, 2016). It was found that there is an increasing trend in the number of orders and the total value (in dollars) of orders (Statistics Canada, 2016). With its increased popularity, little is known about how environmental stimuli can affect buying behaviour. Studying music's effect on this setting can increase consumer knowledge and awareness by avoiding potential stimuli that can negatively bias their buying decisions.

Consequently, this current study had the primary purpose of testing whether background music influences consumer behaviour in an online environment. Music tempo was studied experimentally. Participants were randomly assigned to one of three conditions: no music, slow-tempo music, or fast-tempo music. Based on Milliman's (1982) study, music of 72 beats per minute (bpm) was considered as slow-tempo while music of 94 bpm was considered as fast-tempo. The commonly examined aspects of consumer conduct are length of time spent in store (Milliman, 1982; Milliman, 1986; Jacob, 2006; Yalch & Spangenberg, 2000), positive affect (Andersson, Kristensson, Wästlund & Gustafsson, 2012; MacInnis & Park, 1991) and quality of product evaluation (Milliman, 1982; Milliman, 1986; Yalch & Spangenberg, 2000) were measured in the present study. Amount of time spent shopping was determined by how much time an individual spent reading and reviewing provided information during a product comparison. Affect pertained to an individual's subjective evaluation of their emotions while buying products. Quality of product evaluation was an individual's ability to distinguish a superior product from among the five products assessed; one of the products was superior to the

others (as determined a priori by the experimenter). Shopping experience and product evaluations were measured using a survey wherein individuals rated using a 7-point bipolar adjective scale survey how they felt about the shopping experience (e.g., very good-very bad, enjoyable-not at all enjoyable) or product (e.g., stylish-not at all stylish, high performance-low performance). Pleasure and arousal levels were derived from individuals' answers to Mehrabian and Russell's (1976) Pleasure Arousal Dominance (PAD) survey.

## Hypotheses

Several predictions were made based on past research on the influence of background music on consumer conduct:

### Music and Affect

The presence of music, compared to no music, will result in higher positive affect. Compared to the silent background, the pleasant music would serve to enhance positive affect.

### Music and Time Spent Shopping

The presence of music, compared to no music, will result in greater time spent shopping. The pleasant background music would serve to reinforce shopping behaviour. Participants would spend more time shopping in both these conditions than in the no-music control condition.

### Music Tempo and Quality of Product Evaluation

Low-tempo music, compared to high-tempo music and no music, will produce high quality evaluations. If, as predicted above, music increases time spent shopping, the potential is created for greater study of product attributes and higher quality decision making if music is played. However, high-tempo music could serve as a distracter and thus eradicate the potential

gain conferred by the extra shopping time. The low-tempo music would not have this disadvantage and thus lead to better reasoning about the product.

It is the hope of the present study to find out if music's effects on consumer behaviour can also be translated to online shopping behaviour. If this is the case, there might be an increased trend in using music in online stores and it is up to the consumers to be mindful of its potential effects on online shopping and prevent its possibly manipulative influence on overall online shopping behaviour.

## Method

### Participants

210 participants (120 men, 74 women and 16 participants who did not indicate their gender) were sampled from two different populations, King's University College undergraduates and survey-takers registered with the Amazon Mechanical Turk (MTurk) website. The mean age was 29.98 years, ranging from 17 years to 68 years. Data from 46 people were eliminated as they failed to do the online shopping simulation (spent 0 seconds in the online shopping simulation) or were considered outliers (when they spent a total amount of shopping time more than 2.5 standard deviations from the mean time of 54.78 seconds). These people were not included in the number of participants stated above.

The University of Western Ontario-King's University College Psychology 1000 students (n=105) were recruited using the SONA website. SONA is a website used by the University of Western Ontario wherein students and faculty can participate in and conduct research studies. These participants received additional 2.5% to their final grade for the completion of their

assignment after participating in the study. Participants needed to be 17 years or older to take part in the study.

Community members, on the other hand, were recruited via MTurk, Amazon's crowdsourcing program (n=105). Participants were required to be English-speaking and 18 years of age or older to participate in the study. Participants were paid $0.50 each for their participation.

**Measures**

**Music.** An instrumental music sequence was used to control for other music variables such as gender of singer, popularity of song, etc. The song selected was adjusted to a slow (72 bpm) or fast tempo (120 bpm) using audio-editing software.

**Demographics.** Participants were asked to provide their age and sex. Country of origin was available from the internet sample.

**Attractiveness of headphones.** In the present study, participants were asked to rate the attractiveness of five different pairs of headphones based on provided product attributes. One of the headphone pairs was purposely assigned features that made it the superior choice among the five. Each of the headphones was rated for attractiveness on a 5-item sliding scale ranging from an unhappy face (scored -2) to a happy face (scored 2). Thus, the scale range was -2 to 2. To avoid possible artifacts associated with headphone appearance, pictures were omitted. Pricing of the headphones was also made similar, differing in less than a dollar.

**Hypothetical purchase choice and actual intention to purchase.** Participants were asked to choose which product they would buy and to rate the likelihood that they would buy their chosen product on a 7-point rating scale of *very unlikely* (scored 1) to *very likely* (scored 7).

**Evaluation of product attributes.** Specific product attribute evaluations were obtained using an author-constructed questionnaire. Seven-point bipolar ratings—from 1 (lowest score) to 7 (best score)—were elicited on each of six attributes (*lowest performance-highest performance, useless-useful, conservative-innovative, low quality-high quality, not handy-handy, impractical-practical*). See Appendix A. Ratings were averaged across all 6 items to yield a score ranging from 1 to 7. Mean for the total sample was 5.31 and *SD*=.90, α=.70.

**Pleasure arousal dominance.** The Mehrabian and Russell (1974) Pleasure Arousal Dominance (PAD) Survey was also included to assess the level of pleasure and the level of arousal experienced during the simulated shopping experience. This survey used a 7-point bipolar scale for each of 17 adjective pairs (e.g., *contented-depressed, hopeful-despairing, stimulated-relaxed, excited-calm, controlling-controlled, dominant-submissive, influential-influenced*). The participants were asked to select the number along the scale that most closely described them or their preferences. See Appendix B. Pleasure ratings were averaged across all eight items to yield a score ranging from 1 to 7 (α=.89). Arousal ratings were also averaged across six pertinent items to yield a score ranging from 1 to 7 (α=.72). Dominance ratings were averaged across and three items to yield a score ranging from 1 to 7 (α=.58). The scores were also averaged across the 17 items to obtain a measure of overall affect and was found to be highly reliable (α=.88).

**Participant involvement.** Three comprehension questions were asked about the different products presented and the participant's answers to the questions could either be right or wrong (Questions included: (a.) Of the following headphones listed, which pair of headphones cannot connect wirelessly to devices? (b.) Of the headphones listed, which pair of headphones

cannot connect to Android devices? (c.) Of the headphones listed, which one has ear pads made of leather?). See Appendix C. If a participant got at least two questions correct, high mental involvement was awarded. In contrast, for a participant who got none or only one of the questions correct, low involvement was awarded.

**Design and Procedure**

This study was a between-subjects experiment as it studied the causal effect of music on affect, time spent shopping, product evaluations, and decision-making quality. The independent variable investigated was background music with three levels: no music, slow-tempo music (70 bpm), and fast-tempo music (120 bpm). All procedures of this study were approved by the King's University College Research Ethics Review Committee.

King's University College of University of Western Ontario Psych 1000 participants and Mturk workers signed up by following a Qualtrics link in the King's SONA or Amazon M-Turk websites, respectively. The study began with an audio that asked participants whether or not they were University of Western Ontario-King's University College Psychology 1000 participants. Under the audio player, there was an instruction to turn on the volumes to ensure the audibility of the music played during the online shopping stimulation. Participants were then asked to read the informed consent form (SONA participants-Appendix A; Amazon MTurk participants-Appendix B) and click "agree." If they did not click agree, they were exited out of the study. After obtaining informed consent, participants were randomly assigned to one of three conditions: no music, slow-tempo music, or the fast-tempo music. In all conditions, participants were asked to rate, on a 5-point scale, each pair of headphones on the list. The amount of time ($M$=52.65

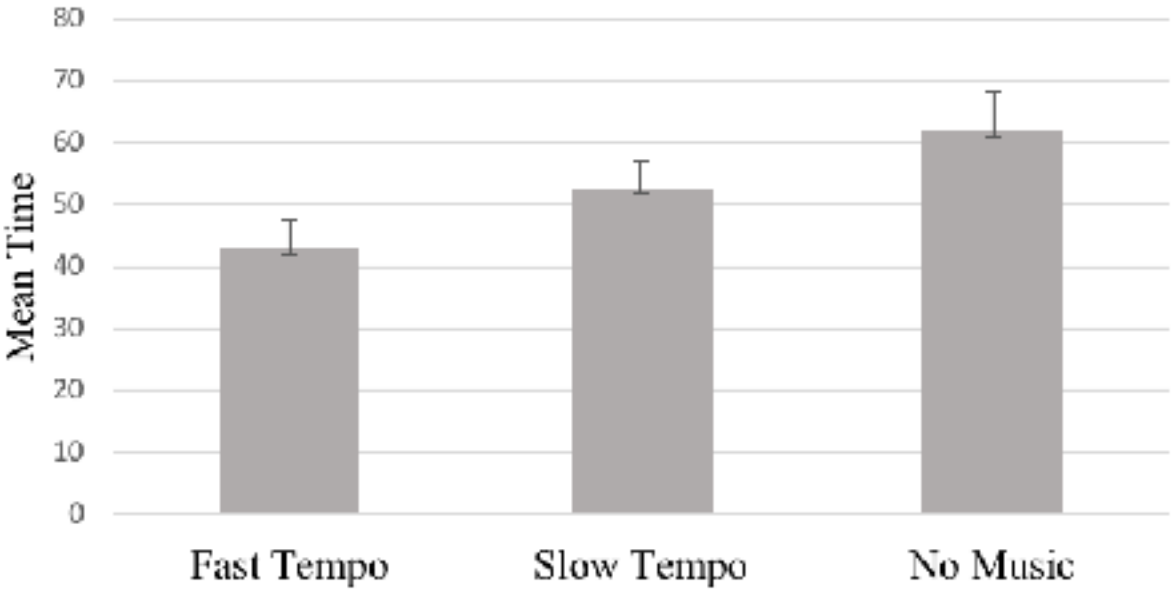
seconds*, SD*=42.70*)* the participants spent in this section was also recorded using the timer feature on Qualtrics.

After the completion of this section, participants were asked to complete the author-compiled survey including demographics, hypothetical purchase choice and actual intention to purchase, evaluation of product attributes, Mehrabian and Russell's (1974) PAD scale, and participant involvement. After the surveys were completed, participants were then asked to read the Debriefing Form and were thanked for the participation in the online study. M-Turk workers were then compensated with $0.50 cents for participating in the study. Psych 1000 students, on the other hand, were given a class credit after submitting their lab assignment.

## Results

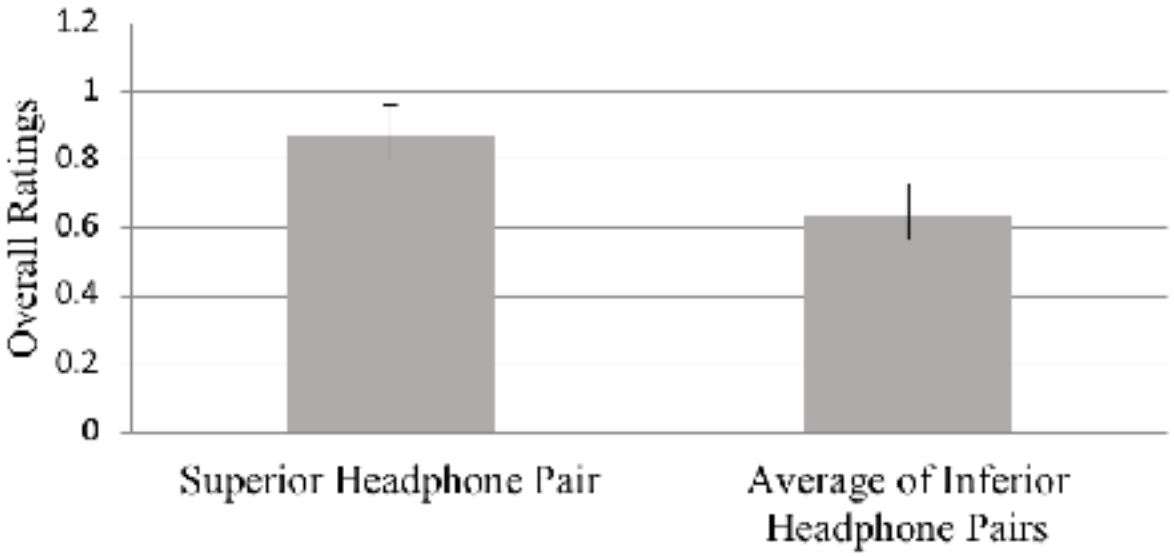
**Music and time.** A one-way analysis of variance (ANOVA) was used to look at the effects of music tempo on time and it was found that music had a significant effect on total amount of time spent shopping, $F(2, 207)=3.57$, $p=.030$. Post hoc analyses using Tukey's HSD indicated that the total time spent during the online shopping simulation was shorter when fast tempo music ($M=43.18$, $SD=35.97$) was played than when no music ($M=62.15$, $SD=51.55$) was played as shown in Figure 1. When slow tempo music ($M=52.76$, $SD=37.26$) was played, individuals did not differ in their time spent from either the fast tempo music or the no music condition. Thus, these results provided some evidence that music does affect time spent online shopping, however, opposite to what was previously predicted, time spent shopping was shortest in the fast tempo condition without necessarily affecting the quality of their evaluation on the headphone pairs.

**Figure 1. The Effect of Music on the Total Amount of Time Spent Online Shopping**




**Music and pairs of headphones evaluation**. A mixed-model ANOVA was conducted with music as the between-subjects factor and headphones evaluation as the within-subjects factor. Only a significant effect of headphones evaluation was discovered, $F(1,145)=7.11$, $p=.009$. This finding suggests that individuals were able to distinguish the most superior pair of headphones ($M=.87$, $SD=1.15$) amongst the other pairs of headphones ($M=.64$, $SD=.81$) presented during the online shopping simulation regardless of what experimental condition they were in as shown in Figure 2. Hence, participants' judgment quality remained stable among the different music conditions.

**Figure 2. The Difference of the Superior Pair From the Average of the Inferior Headphones**




**Product evaluation and likelihood to purchase.** In order to test if participants' evaluation of the products and their likelihood to purchase the product, a one-way ANOVA was conducted for each variable. It was found that music did not affect product evaluation, $F(2, 184)=.16$, *ns,* nor did it affect the likelihood of individuals to purchase the product that they have chosen, $F(2, 183)=.13$, *ns.* These findings do not support our prediction that the presence of music increases positive product evaluation and buying behaviour.

**Music and affect.** A series of one-way ANOVAs were completed to measure participants' overall rating for emotions and each of its subcategory namely pleasure, arousal and dominance. Music did not have a statistically significant effect on overall emotions, $F(2, 184)=.28$, *ns.* Music did not affect participants' feelings of pleasure $F(2, 184)=.24$, *ns.* It also did not affect individuals' arousal levels, $F(2, 207)=.37$, *ns*, nor did it affect individuals' feeling of

dominance, $F(2, 184)=.32$, *ns.* The results described above suggested that, contrary to what was hypothesized, there was no influence of music on emotion.

**Music and involvement.** A one-way ANOVA was done to measure how well individuals paid attention to product specifics by asking participants questions with answers that can either be right or wrong. It was found that music tempo did not have a significant effect on involvement, $F(2, 207)=.15$, *ns.* This means that the hypothesis was not supported as participants' ability to successfully answer the questions correctly was not affected by music.

**Demographics analyses**. Age and sex were analyzed for of the dependent variables mentioned above. However, the sex of the participant did not produce a main effect and did not interact with other variables in producing an effect on any dependent variable.

## Discussion

This study examined the possible impact of music presence and tempo on thought during a simulated online shopping experience. Although music conditions did not differ from control on degree of mental involvement produced, an unexpected association between music condition and thought efficiency was found. In this discussion, I will summarize the findings of the study, elaborate on the possible reasons for negative findings, suggest an explanation for the efficiency finding, outline possible future directions for research, and indicate some possible practical implications.

### Findings

**Emotional responses.** The results of this research revealed that music did not have a statistically significant effect on emotions, namely pleasure, arousal and dominance. It was

hypothesized that if music served as a reward for shopping behaviour, there would be an increase in positive affect. However, based on the current study, this expectation was not supported.

**Mental involvement.** Contrary to what was predicted, the manipulation used in this study did not affect mental involvement. Foremost, no differences emerged across conditions in the ability of participants to distinguish the set of headphones that had the superior features. The ability was demonstrated in all conditions. In a similar vein, music also did not have a significant effect on judgment of product quality or on rated motivation to purchase the product chosen. Thus, the hypothesis that slow tempo music would significantly increase scrutiny of product qualities was not supported.

**Deliberation time and possible thought efficiency.** Based on the operant conditioning theory and elaboration likelihood model, we hypothesized that music would increase the total amount of time spent in store. Although the manipulation had a statistically significant effect on deliberation time, post hoc analysis indicated that the total time spent during the online shopping simulation was shortest when fast tempo music was played and longest when no music was played. When slow tempo music was played, individuals finished the online shopping task at an intermediate rate although this was not found to be statistically significant. Combined with the fact that mental involvement measures did not differ across conditions, the deliberation time findings suggest that participants in the fast tempo condition arrived at their correct judgments faster than control participants. In short, the former showed more mental efficiency than the latter.

In summary, hypothesized effects were not found. An unexpected result relating to the efficiency of product evaluation was found.

**Explaining the Negative Findings for Thought Involvement and Affect**

This study failed to confirm previous studies that found that music influenced several shopping related variables such as brand attitudes (Park & Young, 1986), purchases (Milliman, 1982), and pleasure and arousal (Andersson, Kristensson, Wästlund & Gustafsson, 2012). The previous work tested shoppers in a physical store whereas the present study tested shoppers in an online shopping task. Something in the many differences between the physical and virtual shopping environments could have led to the failure to confirm. Assuming for the moment that the previous studies comprised a valid and reliable finding for the physical store setting used, here are some possible reasons why the present study could not confirm the physical store findings:

**Difference in cognitive requirements.** Perhaps the processing demands differ between the two settings. Music was predicted to influence purchase decisions of shoppers by decreasing the processing ability of shoppers and acting as a persuasive cue. Music, nevertheless, has no effect on product evaluation and likelihood of purchase. The presence of music did not lead shoppers to evaluate the product they chose more extensively, and it did not persuade them to buy the product they chose. Following the information processing theory, this phenomenon is perhaps because online shopping is not as affected by peripheral cues as in physical store shopping. The central route of persuasion may be highly used in online shopping decisions as shoppers are more reliant on the product information provided, and correspondingly less able to examine physical attributes by sight and feel, to get a better grasp of what a product is like. In short, shoppers are more dependent on described product aspects.

**Difference in motivations.** Individual motivations to visit the online shop than the actual store may differ in that one serves utilitarian purposes whereas the other is more hedonistic. Hedonistic means the shopping objective is for pleasure of the overall experience whereas utilitarian is for accomplishing a focused task (Kaltcheva & Weitz, 2006). We surmise that in-store shopping is more hedonistic due to the more complex physical environment (with people, interesting displays, walking, navigating) and one more capable of arousing pleasant affect. Online shopping, on the other hand, is more goal-oriented and dependent on evaluation of text. It is limited in stimuli capable of generating positive affect.

**Explaining the Evident Musical Effect on Mental Efficiency**

Parallel to the expected outcome that music tempo affects time spent in store, deliberation time was shortest when fast tempo music was played albeit music had no effect in their ability to distinguish the superior pair of headphones from the others during the online shopping simulation. The results of this experiment, therefore, do not support the idea that music is a persuasive tool. As mentioned, elaboration likelihood model postulates that music acts as a peripheral cue in that it can alter consumer's product preference and judgment especially when involvement is low (Petty and Cacioppo, 1986). This was not supported as ability was not increased nor decreased by the presence (or absence) of music: Participants in all conditions successfully distinguished the superior headphone from the others.

Music increases mental efficiency by decreasing shopping processing time without sacrificing the ability to process information carefully. This effect was most apparent in the fast tempo music condition. Slow-tempo music also showed a decrease in processing time although this effect was not statistically significant. Comparable results were found by Lesiuk (2005) in a

longitudinal study. Workers were asked to listen to music for five weeks with the exception of the fourth week wherein all employees were told not to listen to music. In this study, Lesiuk (2005) found that quality of work decreased and time on task increased when no music was played. Lesiuk (2005) attributed these changes to music's assistance on pacing individuals and increasing ability to process material. This suggests that music acts on cognitive central processing, as opposed to peripheral processing. Perhaps the faster music in the present study increased the pace of thought. It was also found that fast tempo music aids in cognitive inhibition, the ability to discount irrelevant stimuli and focus on the current task (Mansouri et al., 2017). This perhaps explains the decreased processing time when fast tempo music is played. When no music is played, participants are perhaps more susceptible to distractions which leads to a longer processing time.

**Future Research**

Replication of the current study would be beneficial as no other studies have looked at this phenomenon in the online setting. Extending this experiment may increase our knowledge of the effects of environmental stimuli on consumer behaviour.

Furthermore, since online shopping was simulated in the current study, generalizability may be limited. For future research, we suggest that the survey questions be inserted in actual online stores. Perhaps the effect of music on emotions were not as clear in the current study as the online shopping simulation was shorter than the time usually devoted to actual online shopping. The online shopping simulation in the current experiment was perhaps short and not enough to create differences in the emotions of participants. Furthermore, it was also hard to gauge purchase behaviour as they did not actually buy the products and instead indicated their

likelihood of buying. This issue can easily be addressed by doing the study in an online retail shop where one can quantify expenditure.

## Implications

**Theoretical implications.** Music affects online consumer behaviour and its effects are different from what was previously found in the in-store context. This may mean that the mental processes that are active during in-store shopping differ from those during online shopping. This indicates the need for further investigation regarding the effects of music and music tempo in consumer decision making process.

**Practical implications.** Consumers must be conscious of the environment they are in when shopping online as some environmental stimuli such as music may have subtle but significant effects on decision making. Furthermore, online shoppers may have an advantage to in-store shoppers as online shoppers may be less susceptible to some of the persuasive manipulations tested and known to affect shopping in a physical store. This is evident by how background music did not affect online shoppers' judgment as they were still able to effectively distinguish the higher quality product.

## Conclusion

Music affects online consumer behaviour by decreasing deliberation time but not affecting judgment. Individuals spend a shorter time online, compared to no-music controls, when fast tempo music was played. Other research suggests that this could be due to music serving to pace thought, to mask potential distractors, or both. As this study is the first of its kind, its findings would benefit from further replication. With the knowledge that music influences

consumer cognition, customers need to be cautious of spurious influences on their shopping behaviour, whether the environment is physical or online.

References

Andersson, P. K., Kristensson, P., Wästlund, E., & Gustafsson, A. (2012). Let the music play or not: The influence of background music on consumer behavior. *Journal of Retailing and Consumer Services, 19*(6), 553-560. doi:10.1016/j.jretconser.2012.06.010

Areni, C. S., & Kim, D. (1993). The influence of background music on shopping behavior: Classical versus top-forty music in a wine store. *Advances in Consumer Research, 20*, 336-340.

Canada Post. (2018). *Go North e-commerce*. Retrieved from https://www.canadapost.ca/web/en/pages/gonorth/default.page?LOCALE=en&ecid=murl%7Cpdn%7Cih%7C94

Gorassini, D. R. (2017). *Composing persuasive messages: Science and ethics,* Second Edition. Amazon Kindle Books.

Gorn, G. J. (1982). The effects of music in advertising on choice behavior: A classical conditioning approach. *Journal of Marketing, 46*(1), 94-101.

Jacob, C. (2006). Styles of background music and consumption in a bar: An empirical evaluation. *International Journal of Hospitality Management, 25*(4), 716-720. doi: 10.1016/j.ijhm.2006.01.002

Kaltcheva, V. D., & Weitz, B. A. (2006). When should a retailer create an exciting store environment? *Journal of Marketing, 70*(1), 107-118. doi: 10.1509/jkmg.2006.70.1.107

Kellaris, J. J., & Cox, A. D. (1989). The effects of background music in advertising: A reassessment. *Journal of Consumer Research, 16*(1), 113-118. doi:10.1086/209199

Lesiuk, T. (2005). The effect of music listening on work performance. *Psychology of Music, 33*(2), 173-191. doi:10.1177/0305735605050650

Macinnis, D. J., & Park, C. W. (1991). The differential role of characteristics of music on high- and low- involvement consumers' processing of ads. *Journal of Consumer Research, 18*(2), 161-173. doi:10.1086/209249\

Mansouri, F.A., Acevedo, N., Illipparampil, R., Fehring, D. J., Fitzgerald, P.B., & Jaberzadeh, S. (2017). Interactive effects of music and prefrontal cortex stimulation in modulating response inhibition. *Scientific Reports (Nature Publisher Group), 7,* 1-13. doi:10.1038/ s41598-017-18119-x

Mehrabian, A., & Russell, J. A. (1974). A verbal measure of information rate for studies in environmental psychology. *Environment and Behavior, 6*(2), 233-252. doi: 10.1177/001391657400600205

Milliman, R. E. (1982). Using background music to affect the behavior of supermarket shoppers. *Journal of Marketing, 46*(3), 86-91.

Milliman, R. E. (1986). The influence of background music on the behavior of restaurant patrons. *Journal of Consumer Research, 13*(2), 286-289. doi:10.1086/209068

Morrin, M., & Ratneshwar, S. (2003). Does it make sense to use scents to enhance brand memory? *Journal of Marketing Research, 40*(1), 10-25. doi:10.1509/jmkr. 40.1.10.19128

Park, C. W., & Young, S. M. (1986). Consumer response to television commercials: The impact of involvement and background music on brand attitude formation. *Journal of Marketing Research, 23*(1), 11-24.

Petty, R. E., & Cacioppo, J. T. (1986). *Communication and persuasion: Central and peripheral routes to attitude change*. New York: Springer-Verlag.

Smith, P. C., & Curnow, R. (1966). "Arousal hypothesis" and the effects of music on purchasing behavior. *Journal of Applied Psychology, 50*(3), 255-256. doi:10.1037/h0023326

Statistics Canada. (2016, October 7). *2010 Census of Canada Retail and Wholesale Trade: Online Shopping, Canadian online shoppers, by type of purchase, 2010 Census.* 3

Tantanatewin, W., & Inkarojrit, V. (2016). Effects of color and lighting on retail impression and identity. *Journal of Environmental Psychology, 46*, 197-205. doi:10.1016/j.jenvp.2016.04.015

Yalch, R. F., & Spangenberg, E. R. (2000). The effects of music in a retail setting on real and perceived shopping times. *Journal of Business Research, 49*(2), 139-147. doi:10.1016/S0148-2963(99)00003-X

## Appendix A

### Evaluation of Product Attributes Questionnaire

Please rate the product you have chosen on the following attributes:

| • | • | • | • | • | • | • |
|---|---|---|---|---|---|---|
| lowest performance | | | | | | highest performance |

| • | • | • | • | • | • | • |
|---|---|---|---|---|---|---|
| useless | | | | | | useful |

| • | • | • | • | • | • | • |
|---|---|---|---|---|---|---|
| conservative | | | | | | innovative |

| • | • | • | • | • | • | • |
|---|---|---|---|---|---|---|
| low quality | | | | | | high quality |

| • | • | • | • | • | • | • |
|---|---|---|---|---|---|---|
| not handy | | | | | | handy |

| • | • | • | • | • | • | • |
|---|---|---|---|---|---|---|
| impractical | | | | | | practical |

## Appendix B

### Mehrabian and Russell's (1974) Pleasure Arousal Dominance Scale

Please rate how you were feeling while shopping online:

| | | | | | | |
|---|---|---|---|---|---|---|
| • | • | • | • | • | • | • |
| Contented | | | | | | Depressed |
| • | • | • | • | • | • | • |
| Happy | | | | | | Unhappy |
| • | • | • | • | • | • | • |
| Satisfied | | | | | | Unsatisfied |
| • | • | • | • | • | • | • |
| Pleased | | | | | | Annoyed |
| • | • | • | • | • | • | • |
| Relaxed | | | | | | Bored |
| • | • | • | • | • | • | • |
| Important | | | | | | Insignificant |
| • | • | • | • | • | • | • |
| Free | | | | | | Restricted |
| • | • | • | • | • | • | • |
| Hopeful | | | | | | Despairing |
| • | • | • | • | • | • | • |
| Stimulated | | | | | | Relaxed |
| • | • | • | • | • | • | • |
| Excited | | | | | | Calm |

| | | | | | | |
|---|---|---|---|---|---|---|
| • | • | • | • | • | • | • |
| Jittery | | | | | | Dull |
| • | • | • | • | • | • | • |
| Aroused | | | | | | Unaroused |
| • | • | • | • | • | • | • |
| Frenzied | | | | | | Sluggish |
| • | • | • | • | • | • | • |
| Awake | | | | | | Sleepy |
| • | • | • | • | • | • | • |
| Controlling | | | | | | Controlled |
| • | • | • | • | • | • | • |
| Dominant | | | | | | Submissive |
| • | • | • | • | • | • | • |
| Influential | | | | | | Influenced |

## Appendix C

## Participant Involvement Questionnaire

Please choose the correct answer:

1. Of the following headphones listed, which pair of headphones cannot connect wirelessly to devices?

| | | | | |
|---|---|---|---|---|
| • | • | • | • | • |
| Dante Headphones | Labatt Headphones | Broughdale Headphones | Wemple Headphones | Lenardon Headphones |

2. Of the headphones listed, which pair of headphones cannot connect to Android devices?

| | | | | |
|---|---|---|---|---|
| • | • | • | • | • |
| Dante Headphones | Labatt Headphones | Broughdale Headphones | Wemple Headphones | Lenardon Headphones |

3. Of the headphones listed, which one has ear pads made of leather?

| | | | | |
|---|---|---|---|---|
| • | • | • | • | • |
| Dante Headphones | Labatt Headphones | Broughdale Headphones | Wemple Headphones | Lenardon Headphones |