Effects of Ambient Music Exposure on Simulated Buy Decisions

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Abstract

Previous research has revealed a complex but mostly positive relationship between exposure to music and various aspects of consumer behavior. Much of that research took place in the field and most of it involved observations or questionnaires for data collection. The purpose of this study was to find corroborating evidence for previous research on the affective quality of music in marketing contexts in a well-controlled laboratory experiment using the tools and techniques common to other areas of research in human cognition. This is the first study to investigate causal connections between music and simulated buying behavior in the laboratory. The results indicate that exposure to music shortens viewing times and inhibits buy decisions. The results also indicate a linear relationship between reaction time and buy decisions such that, on average, unwanted items are rejected quickly and longer viewing times result in more buy decisions. To not buy something appears to be the default, unconscious, rapid and automatic decision while buying something appears to require more conscious cognitive effort and processing time.

Keyword: Consumer behavior, experiment, music, retail, buys decision, reaction time

1.Atmospherics have received a lot of attention from researchers. Turley and Milliman (2000) provide a useful review of that research. Music has received a large portion of that attention. Kellaris (2008) and Allan (2007) provide useful reviews of the music research. Most of the early research in that area has been field studies with only a relative handful of laboratory studies while more recent research is generally balanced between the field and the laboratory. The field studies have commonly employed surveys for data collection as have many of the laboratory studies. Some field studies employed observational techniques. Researchers conducting those previous studies have reached conclusions and suggested managerial actions concerning various aspects of music in marketing contexts. Partly in response to these suggestions an industry has grown that provides music to retail, restaurant, and other business types and claims to drive sales and improve customer experience (Eroglu, Machleit, & Chebat, 2005) with Muzak being only among the oldest and most famous of these businesses.

There has been less modeling and theory building over the last several decades than might be expected given the amount of research done on music in the marketplace and the practical applications extant. That may be a testament to the inherent complexity of music and especially to the complexity of our involvement with it. Many appeals to theory in this line of research reference the Mehrabian-Russel Model (Mehrabian & Russel, 1974) of environmental psychology (Allan, 2007). That model views people (e.g. consumers) as more or less rational agents whose consciously available emotional responses to environmental cues dictate, or at least mitigate, their behavioral responses. Martin and Morich (2011) take a different approach to modeling consumer behavior, one not specific to and to my knowledge has not yet been cited in atmospherics research, whereby consumers are exposed to cues and respond behaviorally but stimulus and response are very often, perhaps always, mediated by unconscious processes.

Data precedes theory and so it might be that much more research on music in particular and atmospherics in general must be done before viable models native to consumer research and specifically applicable to atmospherics emerge. Particularly, more laboratory experiments that test causal hypotheses need be done. The observational and correlational analyses of field studies have yielded much useful information about relationships between music and consumer behavior.

But models that make useful predictions require a foundation of at least as much causal as correlational data. The additional controls available in laboratory experiments limit the number of alternative explanations of observations compared to field studies. To be confident, then, that conclusions reached through field studies are true causal statements about the world similar results should obtain in controlled laboratory experiments (Kardes, 1996).

This study has two purposes. The first is to test conclusions reached in previous (mostly) field research in controlled laboratory conditions to corroborate those findings using efficient and high power experimental designs and the techniques and tools common to research in other areas of human cognition. The aim here is to directly test causal hypotheses suggested in previous research in a well-controlled laboratory setting. Specifically the effects of affective quality of music on simulated purchasing behavior will be tested. The second purpose of this study is to develop an experimental paradigm to test such behavior in the laboratory that involves some of the behaviors and decision making that consumers use "in the field" but do so using reaction time and explicit buy/no buy decision data. The hope is that by doing this some of the criticism that laboratory experiments are too artificial will be stemmed and acceptance of the paradigm by other researchers will be fostered.

1.1 Background

Previous studies, many in the field and some in the lab, have identified relationships between affective qualities of music and specific behaviors of consumers. Please note that other studies not noted here investigated qualities of music and perception and appeared in marketing journals such as much of the work of Kellaris and some of the work of Holbrook and their collaborators. I've attempted to confine studies cited here mostly to those that include some specific and easily identifiable consumer-like behavior as their dependent measures or are otherwise directly related to the stated purpose of this study. Please also note that synthesis of the work cited here occurs later in this paper in the section about hypotheses. The field studies are covered first.

Milliman (1982) observed supermarket shoppers. He hypothesized and found that slow tempo music both slowed traffic flow through the store and increased daily sales compared to fast tempo music.

Milliman (1986) observed restaurant patrons. He hypothesized and found that patrons would spend more time at the table while slow tempo music played compared to fast tempo music. Slow tempo music was also associated with more purchases from the bar and increased gross margin compared to fast tempo music.

North, Hargreaves and McKendrick (1999) observed and surveyed wine shoppers in a United Kingdom supermarket. They observed an association between playing German music and increased sale of German wines and also playing French music and increased sale of French wines.

Caldwell and Hibbert (2002) failed to find a relationship between tempo and length of dining time when observing restaurant patrons. They did, however, find that musical preference was associated with length of time dining and that length of time was a reliable predictor of money spent.

El Sayed, Farrag, and Belk (2003) surveyed shoppers in Egyptian malls. They found that slow tempo music was associated with higher levels of intention to buy compared to fast tempo music.

Wilson (2003) surveyed patrons of an Australian restaurant. She found that what she termed "upscale" music (jazz, popular, classical) was positively associated with amount patrons were willing to spend. Easy listening and especially no music were negatively associated with willingness to spend. See North and Hargreaves (1998) and Areni and Kim (1993) for related findings.

Eroglu, Machleit, and Chebat (2005) surveyed shoppers in a mall and found that they were more likely to buy a snack or browse in a store without intending to buy under slow tempo music conditions than under fast tempo music conditions.

Vaccaro, Yucetepe, Ahlawat, and Lee(2011) found in a field study survey that liked music was positively correlated with the musical dimension Happy. They also found that respondents were more likely to indicate return shopping intentions under liked music conditions compared to not liked music conditions.

Now laboratory studies involving music tempo, mode, and/or affective qualities will be reviewed.

Kellaris and Cox (1989) failed to find experimental evidence that a single exposure to appealing or unappealing music classically conditions participants' product preferences.

Alpert and Alpert (1990) demonstrated in a factorial experiment that major key music was associated with happy musical content while minor key music was associated with sad musical content. They further showed that manipulation of mode (i.e. key type) was effective in inducing good or bad moods.

Kellaris and Kent (1991) used questionnaires to demonstrate that participants found major key music more appealing than minor key music and atonal music the least appealing of the three at slow and moderate tempos. At high tempo minor key music was judged the most appealing.

Dube, Chebat, and Morin (1995) varied tempo of music, among other things, to induce various levels of pleasure and arousal in a factorial experiment. They found a complex relationship between arousal, pleasure, and consumers desire to affiliate in a buyer seller situation.

Alpert, Alpert, and Maltz (2005) studied college students in a factorial experiment crossing music affective quality and affective quality of a purchase occasion. They found that mode affected mood. That is that major key music was considered happy and could induce positive mood and minor key music was considered sad and could induce negative mood (See also Hevner, 1935). They failed to find a relationship between mood (musical mode) and buying intention. However they found an interaction between mood and purchase occasion such that sad music and a sad purchase occasion increased buying intention and happy music and a happy buying occasion increased intention to buy compared to other combinations.

Oakes and North (2006) tested ad recall under fast tempo, slow tempo, and no music conditions. They found that recall was better under slow compared to fast tempo music but that recall was significantly better under the no music condition when compared to the music present (fast and slow tempo combined) condition.

Broekemier, Marquardt, and Gentry (2008) found that laboratory subjects had the greatest shopping intentions when exposed to happy music that they liked compared to other affect and liking combinations.

Cheng, Wu, and Chen (2009) conducted an experiment simulating an online store and found that fast tempo music led to higher arousal and pleasure (See Mehrabian&Russel, 1974) compared to slow tempo music. They did not include a no music condition.

1.2 The Experimental Paradigm

Martin and Morich (2011) posit that much, maybe most, of the cognitive effort that goes into purchase decisions is unavailable to consciousness. This view is generally held among cognitive psychologists for all cognition. Epstein's cognitive-experiential self theory describes this view in a way that generalizes beyond consumer behavior to cognition in general (Epstein, Lipson, Holstein, & Huh,1992; Epstein, Denes-Raj, & Pacini,1995; See Kahnemann, 2011 for a similar view).

The Mehrabian-Russel model and the survey techniques often associated with it have served well for testing that portion of consumer cognition that is conscious and available for introspection and deliberation. Those techniques by definition would not be sensitive to the unconscious portion of cognition. Implicit or indirect measures have been the workhorse of the study of the mind for over one hundred years and especially since the beginning of the cognitive revolution as they allow inference of the workings of the mind by measuring and comparing the behavioral responses that are the result of those cognitions (Stacy & Weirs, 2006). Reaction time studies have been particularly useful for this. None of the studies cited here in previous research on the effects of tempo, mode, and affective qualities of music on consumer behavior use reaction time studies.

The present study used a reaction time task developed specifically for consumer behavior research. Participants viewed photographic images of models on a computer display. Their task was to decide if they would or would not buy the clothing item and indicate their decision by pressing the appropriate button. The two types of data collected were reaction time to press the button (reckoned from the onset of the stimulus photo) and decision type (buy or not buy).

The task was not speeded. Participants were not instructed to make the decision as quickly as possible. They were just instructed to make the decision and the visual stimulus remained on the computer display until the participant pressed one of the buttons. Participants were exposed to various music conditions during the experiments.

There is clearly a conscious component to the task but the contention of Martin and Morich (2011) is that there is also an unconscious component to making the decision. The decision indicated by which button was pressed presumably contains both conscious and unconscious contributions. How would we know that this is the case? Collecting reaction times may give us clues. If there is a relationship between the two dependent variables (reaction time and number of Buy decisions) then we may infer cognitive complexity beyond the overt, conscious indication of the decision itself (i.e. the button press).

1.3 Hypotheses

The experiment has three conditions: happy music, sad music, no music. The music played matches the genre preference of the participant. The hypotheses are:

H1: There is a significant correlation between the two dependent variables in this paradigm.
H2: Buy decisions are lowest in no music conditions. This follows from Wilson (2003).
H3: Buy decisions are highest in happy music conditions. This follows from Alpert et al. (2005); Broekemier et al. (2008).
H4: Reaction times are fastest in the happy music condition. This follows from Alpert and Alpert (1990); Alpert et al. (2005) on the theory that good mood induced by happy music leads higher arousal and faster buys decisions.

2 Experiments: Affective Quality of Music

2.1 Method

2.11 Participants

Forty two students, faculty, and staff at SUNY Buffalo State participated. Age data was not collected but the estimated mean age was 40 years. All participants received a $10.00 gift card as compensation.

2.12 Materials

2.12.1 Visual.Separate female and male versions of the experiment were created so that female participants viewed photographs of female models and male participants viewed photographs of male models. Three hundred photographs each of female and male models wearing spring and summer fashions were downloaded from the website of a regional mid to upscale department store chain having no stores in the Buffalo area. The male and female photographs separately were randomly assigned to three equally sized groups resulting in three stimulus sets for each version.

2.12.2 Auditory. Six songs of the rock era were selected for use in the experiment. Three were happy songs and three were sad songs. One pair of happy and sad songs each was selected from the musical genres Pop, Rock, and Country. All songs contained sung lyrics. A pilot test was conducted to determine the affective quality of the songs selected. Twenty participants who did not participate in the Experiment rated each song on a 7 point scale (1 = happiest; 7 = saddest). Separate t-tests were conducted on the affect ratings of each pair on songs within genres. In all cases the "sad" songs had significantly higher ratings than the "happy" songs.

2.13Procedure

The experiment consisted of three parts that took place in one session. Participants sat at a table facing a 24 inch flat screen computer display which was at eye level of the participants. A button response box was on the table between the participants and the display. The button box was connected to a Dell desktop computer running E-Prime Professional experiment control software (Schneider, Eschman, & Zuccolotto, 2002). During each trial of the experiment one of the photographs of a clothing model appeared on the display. The participants' task was to decide if they would buy the item of clothing or not. If they would buy the item they pressed the button on the far right of the button box marked "Buy" with their right index finger.

If they would not buy the item they pressed the button on the far left of the box marked "Not Buy" with their left index finger. This was not a speeded task. The photograph stayed on the display until the participant responded and then the next trial began. Participants were instructed to assume that they could afford the item, that the item would fit properly, and that they could get the item in a color or color scheme of their preference. One of the songs was played at a comfortable listening volume on close field monitor speakers that flanked the computer display and faced the participants during each of two of the three parts of the experiment. No music was played during the third part. This resulted in a completely within subjects design with three conditions: No Music, Happy Music, and Sad Music. The No Music condition always occurred first to avoid carry over effects from music conditions. The Happy Music and Sad Music conditions were counterbalanced across participants. Participants indicated their preference for Pop, Rock, or Country music on a pre-experiment information form. The genre of the Happy/Sad song pair played during parts two and three of the Experiment matched participants' preference. The dependent variables were Reaction Time to Respond Buy or Not Buy and number of Buy Decisions.

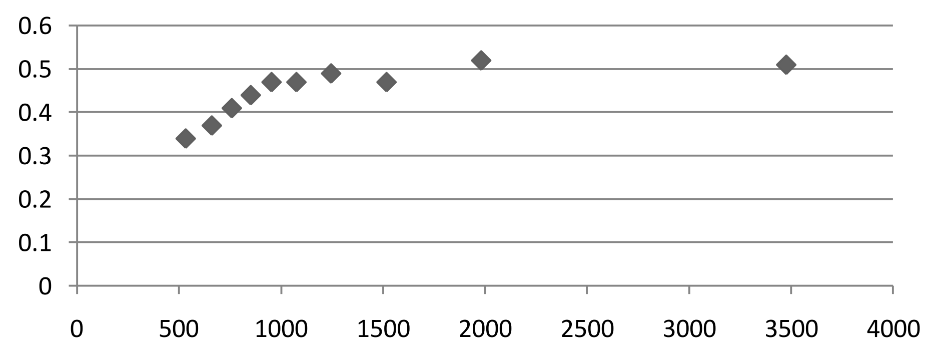
2.14 Results

A paired-samples t-test was performed on mean reaction times to Buy Decisions and No Buy Decisions. Mean Buy Decision times were significantly longer than Mean No Buy Decision times (t =3.647, df = 125, $p < .001$, two-tailed; mean Buy reaction time = 1419 msec, mean No Buy reaction time = 1297 msec).

A paired-samples t-test was performed on mean Buy and No Buy Decisions. There were significantly more No Buy Decisions than Buy Decisions (t = -3.432, df = 125, p = .001, two-tailed; mean Buy Decisions = 44.0, mean No Buy Decisions = 55.1).

A non-parametric test of correlation was performed between the dependent variables on the entire set of responses. There was a significant positive correlation between Reaction Times and Buy/No Decisions (rho = .110, N = 12600, $p < .001$, two-tailed). Responses were rank-ordered by reaction time and probabilities of Buy Decisions were determined for the whole set and portions thereof. The probability of a Buy Decision for the whole set was .45. The mean probability for each decile from fastest to slowest: 1 = .34, 2 = .37, 3 = .41, 4 = .44, 5 = .47, 6 = .47, 7 = .49, 8 = .47, 9 = .52, 10 = .51. Figure 1 shows the average probability of a Buy Decision for the ten deciles rank-ordered by reaction time in milliseconds.

Figure 1. Probability of Buy Decision per Decile of Rank-Ordered Reaction Times

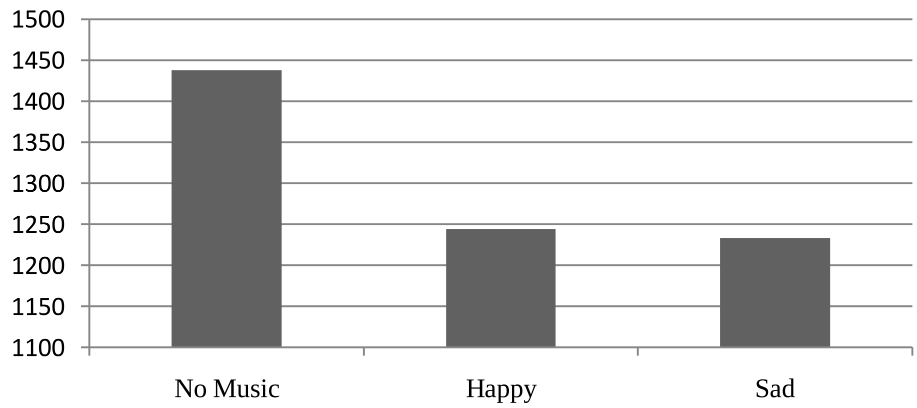


Mean Reaction Times were computed for the three conditions for each participant. Separate within subjects one-way analyses of variance were performed on reaction times for the Whole Set (Buy and No Buy Decisions), the Buy Set (Buy Decisions only), and the No Buy Set (No Buy Decisions only). For the Whole Set there was a significant effect of Music Condition ($F(2,82) = 18.153$, $p < .001$). Planned comparisons showed that the reaction times for the No Music condition (mean = 1438 msec) were significantly longer than the Happy Music condition (mean = 1244 msec) and the Sad Music condition (mean = 1233 msec).

The Happy and Sad Music conditions did not significantly differ from each other. The effect Size for None versus Sad is: Cohen's d = 0.849. This is based on the average SD from two means. This corrects for dependence between means, using Morris and DeShon's (2002) equation 8. Effect Size for None versus Happy is: Cohen's d = .753.

For the Buy Set there was a significant effect of Music Condition (*F*(2,82) = 7.117, *p* = .001). Planned comparisons showed that the reaction times for the No Music condition (mean = 1514 msec) were significantly longer than the Happy Music condition (mean = 1375 msec) and the Sad Music condition (mean = 1368 msec). The Happy and Sad Music conditions did not significantly differ from each other. Figure 2 shows mean reaction times across music conditions for the whole set. Effect Size for None versus Happy is: Cohen's d = 0.461. Effect Size for None versus Sad is: Cohen's d = 0.521. This is based on the average SD from two means. This corrects for dependence between means, using Morris and DeShon's (2002) equation 8.

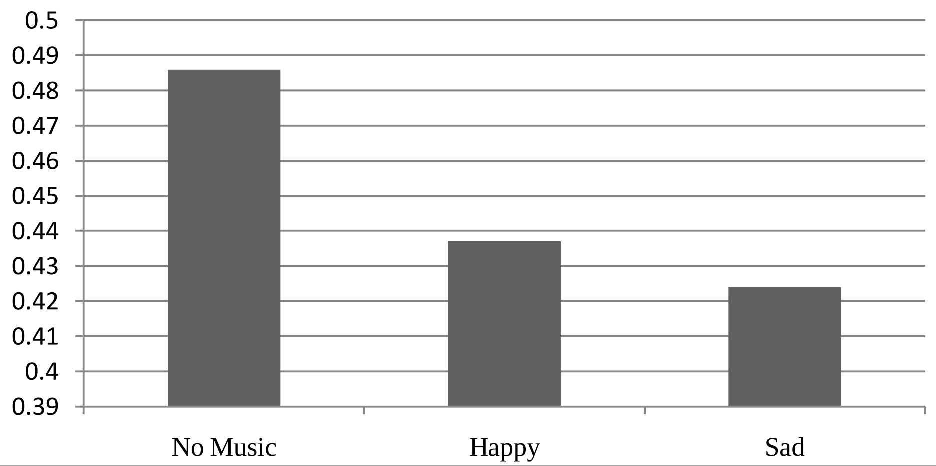
Figure 2. Mean Reaction Time Across Music Conditions



For the No Buy Set there was a significant effect of Music Condition (*F*(2,82) = 10.935, *p* = .001). Planned comparisons showed that the reaction times for the No Music condition (mean = 1421 msec) were significantly longer than the Happy Music condition (mean = 1249 msec) and the Sad Music condition (mean = 1222 msec). The Happy and Sad Music conditions did not significantly differ from each other. Effect Size for None versus Happy is: Cohen's d = 0.491. Effect Size for None versus Sad is: Cohen's d = 0.660. This is based on the average SD from two means. This corrects for dependence between means, using Morris and DeShon's (2002) equation 8.

Mean number of Buy Decisions were computed for the three conditions for each participant. A within subjects one-way analysis of variance was performed on number of Buy Decision for the Whole Set. There was a significant effect of Music Condition (*F*(2,82) = 12.534, *p* < .001). Planned comparisons showed that mean Buy Decisions for the No Music condition (mean = 48.6) were significantly higher than the Happy Music condition (mean = 43.7) and the Sad Music condition (42.4). The Happy and Sad Music conditions did not significantly differ from each other. Figure 3 shows mean probability of Buy Decisions across music conditions for the whole set. Effect Size between None and Happy: Cohen's d = 0.63. Effect Size between None and Sad Cohen's d = 0.874. This is based on the average SD from two means. This corrects for dependence between means, using Morris and DeShon's (2002) equation 8.

Figure 3. Probability of Buy Decision Across Music Conditions



2.2Discussion

The Buy/No Buy paradigm was sensitive to participants' preferences for clothing. Buy decisions were rarer and took longer than No Buy Decisions. Unwanted items were quickly rejected but the longer participants looked at an item the higher was the probability of that item eliciting a Buy response. Participants' responses were markedly different across music conditions. Participants' average viewing time was much longer and the probability of making a Buy decision was much higher when no music was playing than when either happy or sad music was playing. Responses to happy and sad music did not differ from each other.

The quiet condition appears to facilitate longer viewing times and therefore more Buy decisions. Further investigation is required to determine if carry over effects obscured differential effects of happy and sad music. It seems clear, however, that no exposure to music is categorically and measurably different from exposure to music regardless of the music's affective quality.

3. General Discussion

The purpose of this study was to find corroborating evidence for previous research on affective quality of music in marketing contexts using the tools and techniques common to other areas of research in human cognition. One assumption made is that much of the computation and cognitive effort involved in purchase decisions is unavailable to consciousness. This is an entirely reasonable assumption as it is similar to the assumptions made by cognitive psychologists about nearly every area of human endeavor. Thus tools such as questionnaires are unlikely to tap into that portion of consumer decision making that is not open to conscious inspection.

An experimental paradigm was developed for this study that is unlike those used in previous research on this topic. The paradigm measures reaction time and is thus similar to studies conducted on perception, memory, language, attention, categorization and other aspects of cognitive psychology for over one hundred years. It is fitting to use this technique for questions about consumer behavior which after all includes all of the aspects of human cognition listed above. The paradigm proved to be useful. A significant correlation between the two dependent variables (reaction time and buy/no buy decision) was found. This indicates that the buy/no buy decision and the reaction time to make the decisions varied systematically and predictably together. The first hypothesis was thus supported.

The decision definitely includes a conscious component but it must also include an unconscious component. This is because of the linear relationship between the two dependent variables obtained in the experiment. As reaction time lengthened the probability of a buy decision increased. The rejection of the article in question (a no buy decision) came on average rapidly. The acceptance of the article in question (a buy decision) took on average considerably more time. Presumably the extra time is the result of added cognitive effort.

This pattern fits well with the views of the Epstein cognitive-experiential self theory (Epstein, et al., 1992; Epstein, et al., 1995) and a similar view by Kahnemann (2011) that there are, at least metaphorically, two systems to the human mind. One system acts quickly and automatically (i.e. unconsciously) and the other acts more slowly and deliberatively (i.e. consciously). The pattern of results is also amenable to the model in Martin and Morich (2011).

Of further interest is the pattern relating reaction time and probability of a Buy Decision. There is a very linear relationship with a steep slope between the two dependent variables starting at the fastest reaction times and continuing to a point right around one second. After that point the relationship remains linear but the slope of the line from about one second until the slowest reaction times is much flatter. It appears that somewhere around one second may be the cutoff point between the two systems of the mind for this task. Responses with reaction times under one second must be initiated and mostly controlled by unconscious processes. Responses with longer reaction times include unconscious components but may also have time to include some conscious deliberations. It appears that in general rejection of the item under consideration requires little effort or conscious deliberation. This makes rejection of the item the default response. Even at the longest reaction times when probability of a Buy Decision is greatest that probability is only around 0.5.

The decision to buy an item appears to require more cognitive effort. What sort of processes may be happening during the unconscious part of the response? Perhaps the model's image appearing on the display triggers a memory search. If, for example, the memory search reveals quickly that the participant already has the item or one very similar to it, a judgment based on familiarity, then the search ends, the decision is made, the response occurs quickly and, given the short reaction times, mostly unconsciously. Another possibility is that the image triggers a memory search and the result is that the item under consideration is of a style that is not flattering on the participant or that the style is not among those preferred by the participant. In both of those situations the respondent may quickly and unconsciously compare the stimulus to a prototype stored in memory. Again the search ends, the decision is made and the response is given quickly. All of this is consistent with the rapid, automatic, unconscious system of the mind. Buy decisions take longer on average than no buy decisions. Perhaps once an item passes the initial filters other questions enter into the decision and are deliberated more consciously such as "Where will I wear it?" and "What will I wear it with?" which account for the longer average reaction time.

Why, you may ask, does this require any unconscious activity? It sounds like the normal conscious activity of people considering purchases. The answer is in the time course of the decisions. The reaction times for no buy decisions average just about one second and the reaction times for buy decisions average just about one and one half seconds. Consider that about one quarter of a second is required to accomplish the actual manual response of pressing the button after the decision has been madeso that both buy and especially no buy decisions take very little time. Remember that these were not speeded tasks. Participants were not instructed to respond as quickly as possible but simply to make their decision and indicate it with a button press. The responses take far less time than it would take for the internal conversations implied by the last paragraph to happen and certainly less time than it takes to respond to questionnaires. It must be that much of the decision process is rapid, automatic, and unconscious and it takes reaction time studies to reveal this.

The next question to ask about the paradigm used in this study is this: Is it sensitive to the different conditions participants are exposed to? The answer appears to be yes though like many tools much honing must be done to determine when it is most useful. A significant difference was found between conditions in the experiment. So is the paradigm used in this study sensitive to changes in music conditions? Consider the results of the experiment. The results of the experiment are surprising for a different reason. Hypotheses 2, 3, and 4 were refuted. So the paradigm was sensitive to the changes in music conditions. But, surprisingly, Buy decisions were highest and reaction times were longest in the no music condition. It appears that exposure to music interfered with the processes that resulted in buy decisions in this task.

The results of the experiment are not completely surprising, however. Recall that Oakes and North (2006) found that ad recall was best in a no music condition when compared to exposure to music. What processes are common to memory and buying decisions that exposure to music may inhibit? One candidate is attention. Attention is a limited cognitive resource (Johnston & Heinz, 1978; Kahneman, 1973). Processing of speech is so over-practiced that it is considered obligatory (Marslen-Wilson & Tyler, 1981).

The songs used in the experiment all had sung lyrics. Thus some of the participants' attention was devoted to processing the lyrics of the songs. Compared to the no music condition less attention was available to devote to the processes involved with purchase decisions. Buy decisions require more time to make perhaps because they require more cognitive effort. If enough effort is not available because participants are processing lyrics then participants would be more likely to emit the default (No Buy) response. This is exactly what happened. It is less likely that interference in working memory is responsible for the results of the experiment. Working memory has limited capacity but the stimuli used in these experiments are of different types. The music and lyrics would be processed in the "phonological loop" component of working memory while the photographs would be processed by the "visiospatial sketchpad" and so are unlikely to interfere with each other (Baddely, 1992).

One may be tempted to consider music in this study as providing a simple distraction effect. But Fisher (1973) and Sanders and Baron (1975) demonstrated that distraction effects are anything but simple. Both found that demands of the task partly determine any distraction effect. Fisher found lesser distraction effects for more predictable tasks. Sanders and Baron found that simple tasks were actually facilitated by the distraction manipulation they used. By analogy the simple and predictable task in this study is rejecting (i.e. responding No Buy) the stimulus item as that appears to be the default response requiring little cognitive effort and response time. Baron and Sanders theorized that distraction has drive-like effects that compensate for what should be interference of information processing. Mowsesian and Heyer (1973) failed to find evidence that music distracted test takers. Furnham and Bradley (1997) failed to find evidence of music as a general distractor but found some evidence of music as a distractor for a memory task for some personality categories. Further research will be required to determine if music provides any distraction for the tasks used in this study but it seems unlikely that it does. The findings of Fisher and of Sanders and Baron would suggest that ambient music might facilitate the simple, predictable default task of rejecting (i.e. No Buy response) an item. If music distracted participants from the more cognitively complex (because more conscious effort is required) task of accepting (i.e. Buy response) an item one would expect fewer Buy responses at longer reaction times. Just the opposite is true, however, as the positive correlation between dependent measures shows that longer reaction times are associated with a higher probability of Buy decisions.

Future research should investigate the role of attention during purchase decisions and the conditions under which that attention is facilitated and inhibited. How music affects attention processes during purchase decisions should also be investigated. Further research should also investigate the differences between the processes used quickly (i.e. under one second) and those that result in slower responses. For example, perhaps experienced shoppers have developed heuristics that often allow rapid classification of viewed products into buy and no buy categories resulting in the fast responses while some products require further processing which both slows response time and increases probability of a buy decision. The paradigm used during the present study would be useful in this regard and would allow researchers to discover its strengths, weaknesses, limits, and powers.

One limitation of this research may be the use of completely within subjects experimental designs. While they are preferable in many, maybe most, experimental situations they are subject to carry over effects. Using between subjects designs for these studies may reveal effects between music condition types that possibly were masked in the within subjects design. Another limitation of this research may be its ecological validity. This procedure was most similar to consumers using an online catalog so the results may be most generalizable to that situation though it must also apply to retail situations in general to some extent.

3.1 Conclusions

Music may not necessarily be the retailer's friend. The experiment reported on here demonstrates that the probability of a buy decision is greater and product viewing times are longer when no music was played. It would be premature to make specific managerial recommendations based on this experiment. However, the recommendations based on previous research should not be accepted uncritically. If it is a true state of the world that exposure to music facilitates consumer purchases then corroborating evidence for this should be found in the laboratory under controlled conditions. Such was not the case here.

A second conclusion of this work is that the rapid, automatic, unconscious processes involved in consumer behavior are a tractable area of research. Consumer behavior, like all human behavior, is made up of both conscious and unconscious input. A wealth of information is sure to be had by investigating those inputs not reached by instruments such as surveys and observational techniques that can only tap conscious processes and that information will inform theory and practice.

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