

THE IMPACT OF MUSIC TEMPO AND PRODUCT CATEGORY ON CONSUMER PERCEPTION

Matia Torbarina
Jasmina Dlačić
Doris Brčinović

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Abstract

Purpose - The music in marketing represents a powerful tool that activates emotional centres in consumer brains, which has the potential to significantly shape decision-making and behavior during purchasing. Present research examines the impact of music tempo and product category (Think and Feel) on product perception, emotional reactions, and consumer purchase intention.

Methodology - The research was conducted via an online experiment with a sample of 53 participants who were exposed to products from two distinct categories each accompanied by music of different tempos (60 BPM and 120 BPM).

Findings - The results show that music tempo led to a significant difference in Feel product perception, which were evaluated more positively in the slower-tempo music condition than in the faster-tempo music condition. Such a pattern was not observed for Think product perception. Additionally, faster music tempo was found to enhance the relationship between time needed to think about the product and final evaluations of products from the Think category. In contrast, this relationship is negative for all other combinations of tempo and product category. Furthermore, the slower tempo positively affected respondents' emotional state.

Contribution - These findings suggest that the impact of music tempo on consumer behavior is complex and depends on product type and emotional context.

Keywords: music tempo, product perception, emotional reactions, Feel products, Think products, consumer behavior

INTRODUCTION

Contemporary music spans a broad range of techniques, genres, and styles that have emerged because of globalization and the influence of numerous cultures (Smith, 2019). In the contemporary world, music is beginning to be experienced as an experience that shapes emotional, cognitive, and social states. Juslin and Sloboda (2019) emphasize different functions of music (social, emotional, and therapeutic).

In the realm of marketing music represents a powerful tool that can significantly influence consumer behavior through the activation of emotional and cognitive processes. According to North et al. (1999), music activates emotional centers in consumer brains, which has the potential to significantly shape decision-making and behavior during purchasing.

The use of certain musical genres or melodies can evoke various emotional responses in consumers, from happiness, satisfaction, and connection with the brand or retail environment, or act in the opposite direction and evoke unwanted emotions (Chebat et al., 2001). Music can also influence product quality perception and emotional associations among consumers, claim North et al (1999). Furthermore, tempo alone has been shown to encourage feelings of happiness and excitement in consumers (Sun et al., 2023).

This research aims to achieve a couple of contributions. First, we wish to extend the expectancy-value theory (Kotler and Keller, 2006) which emphasizes the role of consumer expectations in the evaluation of products or services by testing how these expectations are affected by the music tempo. Second, the study aims to broaden the understanding of how customers who make decisions based on their own desires and values will have a high probability of being satisfied with their purchases. These postulates come from the self-determination theory which facilitates understanding of consumer motivations (Vansteenkiste and Ryan, 2013). Finally, the purpose of this paper is to examine how music tempo in interaction with product category affects product perception and purchase intention. In doing so, the present research contributes to both the advertising and psychology literature by explaining, in more detail, how does music affect consumers' product evaluations.

1. LITERATURE REVIEW AND RESEARCH HYPOTHESES

Building on the Mehrabian-Russell model (Russel and Mehrabian, 1977), it is assumed that stimulus -specifically music tempo - affects emotional responses and consequently consumer reaction in terms of product perception and purchase readiness. Music through various musical parameters can evoke and regulate a wide spectrum of emotions (Juslin and Sloboda, 2019). Yang et al. (2025) using EEG technology demonstrated that fast tempo music (156 BPM) enhances connectivity across the frontal, temporal, and occipital brain regions. The same paper explains that this is accompanied by increased beta and gamma power associated with alertness and cognitive activation. In contrast, slow tempo music (56 BPM) generates higher theta and alpha power in frontal regions, promoting relaxation and sustained attention.

According to Patel et al. (2020), rhythmic elements in music stimulate reward centers in the brain and influence the release of neurotransmitters such as dopamine, resulting in feelings of satisfaction and pleasure. This neurological response contributes to sensations of pleasure and satisfaction, offering a biological explanation for music's powerful role in shaping the consumer experience.

1.1. Music tempo and emotional responses

Research by Thoma (2018) and Juslin (2020) has shown that faster-tempo music evokes excitement in people, while slower-tempo music encourages feelings of sadness. Sun et al. (2023) in a 92-day field experiment discovered that faster tempo music increases

variety-seeking through arousal mediation ($\beta = 0.46$, $p < 0.001$). Specifically, consumers who listened to music played at 1.8x speed showed significantly more diverse product choices compared to those who listened to music at 0.7x speed.

Physiological responses follow well-established patterns across BPM ranges. Fast-tempo music activates the sympathetic nervous system, increasing heart rate and blood pressure, while slow tempo stimulates parasympathetic responses (Darki et al., 2022). Optimal physiological synchronization occurs when music tempo aligns with an individual's basal heart rate, typically around 60-80 BPM for relaxation and 120-150 BPM for cognitive engagement.

1.2. Differences between product categories

A critical insight from recent research is that the effects of music tempo are dramatically moderated by product type. Pantoja and Borges (2021) discovered that faster tempo music improves taste perception and purchase intentions, with effects being significantly stronger for hedonic food products compared to utilitarian food products. The mechanism operates through sequential mediation: fast tempo increases arousal, which elevates mood, subsequently driving more favorable behavioral outcomes for products consumed for pleasure rather than necessity.

One of the most often used product categorizations the Foote, Cone and Belding (FCB) grid used primarily for determining ad campaign messages (Vaughn, 1986) has been recently updated by Cheong and Cheong (2020), who have adapted the categorization scheme to the present-day products and consumers' habits. FCB-grid differentiates the products along the two axes, first one is the purchase-decision involvement, and the second one is think-feel purchase-decision type.

Think category products are those products that evoke rational thinking in consumers and decision-making based on thorough consideration. Examples of such products used in the research are bicycle, television, and face care cream. Alternatively, the Feel product category is characterized by evoking emotional reactions in consumers during purchase decision-making.

Previously it has been repeatedly shown that there is a relationship between music and emotion, thus, for the present study, products belonging to either Think or Feel dimensions were used, according to their positioning inside the FCB-grid.

Cheong and Cheong (2020) report Think/Feel ratings for several dozens of products and product categories. Additionally, large study (Yang et al., 2025) that analyzed 26,025 video advertisements discovered a key regulatory focus interaction. Specifically, faster-tempo music increased purchase intention by 22-28% in promotion-focused ads (emphasizing gains and aspirations) but has no significant impact in prevention-focused ads (emphasizing security and responsibilities).

1.3. Application in retail environment

The fundamental Milliman effect - which posits that slower- tempo music increases sales through extended browsing time - has been refined by recent research revealing important boundary conditions. Knöferle et al. (2023) discovered that the classic "slow tempo = higher sales" effect is contingent on the musical key: the effect only holds for music in minor keys. When the music is in a major key, tempo has no significant effect on purchasing behavior.

North et al. (1999) showed how participants exposed to classical music or music with high production levels on average rate the product as higher quality compared to those exposed to lower production level music or those not exposed to music. These insights indicate that music affects consumer perceptions not solely through tempo but also through associative clues such as genre and production quality which can shape expectations and evaluations of the product being considered.

Based on the literature review, we propose the following hypotheses:

H1: Faster music tempo will significantly increase consumer's cognition, emotion and purchase intention of the advertised product.

H2: Consumers' cognition, emotion and purchase intention of the product will be significantly higher for the Feel category products than for the Think category products.

H3: Fast music tempo in combination with Feel product category will result in the highest ratings of cognition, emotion and purchase intentions.

H4: Faster music tempo will increase the consumer's positive emotions.

2. METHODOLOGY

The research was conducted via an online survey using the PsyToolkit platform with a total sample of 53 respondents. As part of the research, respondents were randomly assigned to one of two experimental situations. 24 participants were assigned to the fast tempo condition, while 29 were assigned to the slow tempo condition. All participants completed the same task, responding to a series of questions about displayed products while listening to music. The music was an unknown instrumental downloaded from (Pixabay, n.d.). The original melody was played at 60 BPM. The same melody was edited so that its tempo was increased to 120 BPM. Thus, one group was exposed to slow-tempo music (60 beats per minute), and the other group to fast-tempo music (120 beats per minute).

Participants' task was to rate shown products on eight criteria, shown in Figure 1. Each participant was exposed to three products belonging to the Think product categories. These products were bicycle, television and a face care cream. According to Cheong and Cheong (2020) they were rated significantly higher on the Think/Feel dimension than

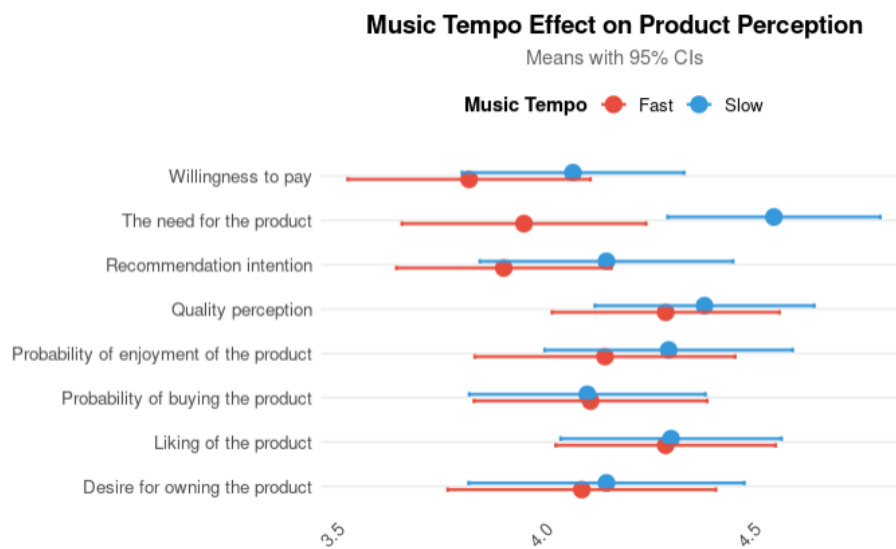
the other three products used in the study which fell into the Feel category (a coat, sunglasses and a watch). Thus, each participant completed 48 trials in which their answer and the time needed for answering the question was measured. Analyses were conducted on a total of 2544 participant ratings.

In the second part of the research, respondents evaluated their emotional state on a scale from 1 to 10. When completing this part of the research, respondents were no longer exposed to either product images or music. All the analyses were conducted using JASP software, and visualizations were done using R package ggplot2 (Wickham, 2016)

3. RESULTS

Hypotheses were tested using a series of t-tests. Results, shown in Figure 1 show that music tempo did not significantly affect respondent perception of displayed products. The only observed difference relates to a more positive response to the question about the need for the displayed product by those respondents who were exposed to slower music.

Figure 1: Comparison of product perceptions based on tempo

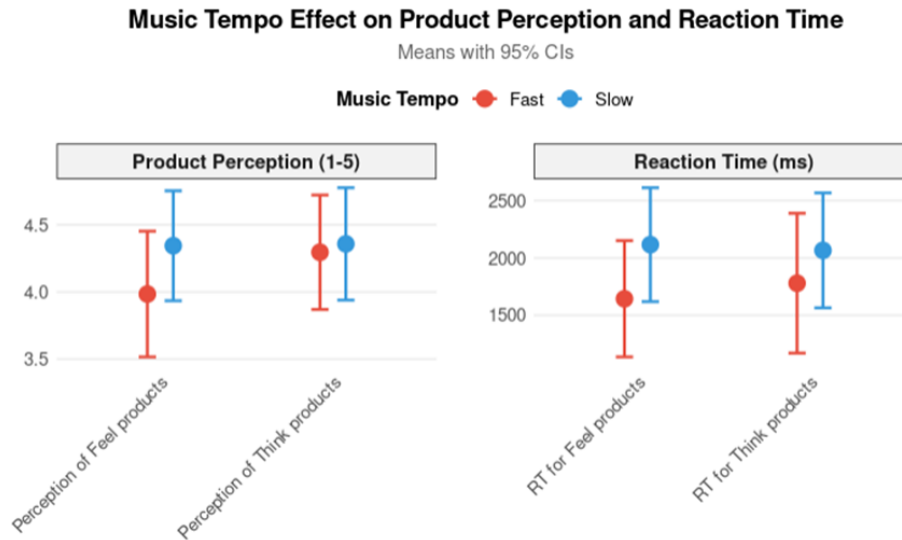


Source: Own work

Since the collected data allowed us to examine the speed with which the participants answered the questions, we have tested whether the music tempo affected the speed with which they were rating the products. The second hypothesis with two ANOVAs with a (2 x 2) design measuring change in reaction time when answering questions about the

product (RT) and average responses to product questions (Perception). Results are shown in Figure 2.

Figure 2: Comparison of reaction times and product perception between categories and tempos



Source: Own work

The analysis shows that music tempo led to a significant difference in Feel product perception, which were evaluated more positively in the slower-tempo music condition than in the faster-tempo music condition. Such a pattern was not observed for Think product perception, which is contrary to the stated hypotheses. To better understand this outcome, additional analyses were conducted.

Notably, a similar trend was observed between reaction time (RT) and product evaluation scores. This observation led to the decision to perform a correlation analysis on all respondent answers to check whether the length of time needed for response (RT) affected the evaluation of Feel and Think products differently.

Figure 3: **The relationship between reaction time and product perception depending on product category and tempo.**

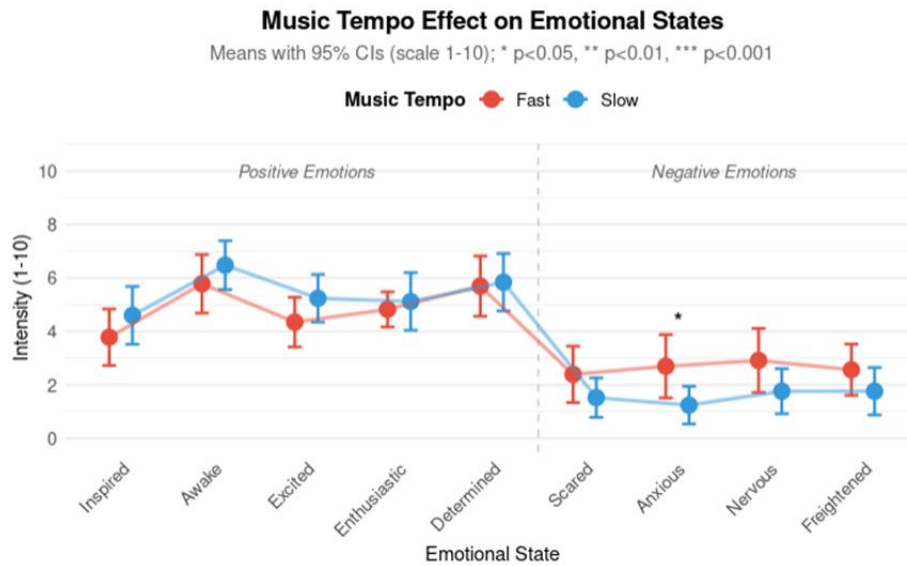


Source: Own work

The figure shows the relationship between the average response time and average rating assigned to displayed products. After extreme results were excluded from analyses ($RT > 4$ seconds), an interesting pattern emerged. The relationship between time required for evaluation and product perception is negative (the more time a respondent spends answering the question - gives a more negative assessment). However, an exception to this pattern was observed among respondents exposed to fast-tempo music. For such respondents, the longer time needed to answer the question led to more positive assessment of products from the Think category.

Finally, to examine whether the difference in positivity of product assessment is a consequence of different emotional states induced by different music, we compared respondents' emotional states based on the experimental condition they were exposed to.

Figure 4: Emotional reactions at different music tempos



Source: Own work

Although the difference nowhere reaches a p-value less than 0.05, the pattern of differences indicates a potential effect of tempo speed on emotional state of the participants. For positive emotions, respondents exposed to slower tempo report higher responses, while the pattern is opposite for negative emotions, reflecting a potential positive effect of slower tempo on emotions.

DISCUSSION AND CONCLUSION

The results of this research provide partial support for the stated hypotheses concerning the impact of music tempo on product perception and consumer behavior.

Contrary to our expectations, the faster tempo did not impact either of the consumers' perceptions. In fact, if anything, the effect seems to be in a reverse direction. Only the need for product was observed to be significantly different between the two groups, with participants in the slow tempo condition indicating higher ratings. variables (willingness to pay, product liking etc.) failed to reach statistical significance. However, most of these variables differ in the same direction, slow tempo is related to higher ratings despite reaching a statistical threshold of 5%. Thus, the H1 is rejected. Similar to the first hypothesis, the second hypothesis is also rejected as there was no difference in product ratings between the categories. The third hypothesis received partial support; however, it is also in the opposite direction than expected. Results have shown that products belonging to different categories were rated differently, but only in the group exposed to

the slow tempo music. Products belonging to the Feel category were rated more favorably than those belonging to the Think category. A potential explanation for this unexpected outcome is found in the analysis that tested how the relationship between the length of time needed for response and the response itself is affected by music tempo and product category. Generally, the relationship between time needed for response and response is negative. The longer respondents took to decide on an answer -- the more negative the answer was. This could potentially relate to the fact that these are less desirable products, which would lead to reduced impulsivity in response and providing a less positive answer. The only situation where this pattern is reversed is when respondents evaluated Think products with fast tempo. In that case, length of time was positively related to the response about product perception.

Finally, H4 can also be rejected as neither of the emotional states reached the significance levels necessary to establish difference between the tempos. However, given the limited sample size, we are interpreting the observed findings with caution when highlighting the fact that the direction of the observed direction follows a pattern in which slow-tempo group indicated slightly higher ratings for positive emotions, and slightly lower ratings for negative emotions. The findings are described in the following section.

Theoretical Contribution

The present paper contributes to the theory in a couple of important ways. First, this predominantly negative correlation between reaction time (RT) and product evaluation can be explained through cognitive fluency theory (Reber and Schwarz, 1999; Alter and Oppenheimer, 2009). According to this theory, easier cognitive processing (shorter reaction time) is associated with more positive evaluations because processing fluency itself has a positive hedonic marker (Reber et al., 2004). When participants respond faster to questions about product perception, it indicates greater certainty and easier information processing, which according to fluency theory is reflected in more positive attitudes. This relationship is consistent with research showing that repeated exposures or easier processing make stimuli more positive (Unkelbach, 2007) and explains why faster decision-making is associated with better product evaluations in the present research.

The exception in the form of positive correlation for Think products with fast tempo music can be explained through cognitive resource theory (Kahneman, 1973; Navon and Gopher, 1979). According to this theory, cognitive resources are limited and must be carefully distributed among different tasks (Wickens, 2002). Fast-tempo music creates a high level of arousal and requires additional cognitive resources, which in combination with analytical thinking about Think products creates cognitive overload. In this case, longer processing time does not reflect uncertainty but deeper engagement with the product that results in more positive evaluations. This finding supports the idea of multiple resources (Norman and Bobrow, 1975) where different task combinations can create synergistic or competitive effects depending on how resources are distributed between musical stimuli and cognitive product processing.

The research also observed a statistically significant increase in anxiety with fast-tempo music. Yang et al. (2025) showed that fast-tempo music increases beta and gamma brain activity associated with arousal, which may explain why some respondents experience increased anxiety. This finding has practical implications for retail - while faster music can encourage impulsive purchases, it can also cause discomfort in some consumers that potentially reduces purchase satisfaction.

The research results extend understanding of the Milliman effect by identifying important boundary conditions. While classical research suggests a simple relationship between tempo and sales, our findings indicate a more complex picture where product type moderates this relationship. Sun et al. (2023) found that mediation through arousal explains 46% of variance in variety-seeking, which is consistent with our finding that faster tempo affects primarily through emotional mechanisms.

Particularly interesting is the comparison with Yang et al. (2025) research that analyzed 26,025 advertisements and found that tempo affects only promotion-focused messages. Our Feel products conceptually overlap with promotion focus (aspirations, pleasure), while Think products correspond to prevention focus (security, functionality). This convergence of findings across different methodologies strengthens theoretical understanding of when and how music tempo affects consumers.

In addition to the above, the paper contributes to understanding expectancy-value theory where music or music tempo is added in the context of understanding consumer reaction and product perception. Products displayed with slower music were evaluated more positively than products displayed with faster tempo, whereby it is necessary to distinguish products from Feel and Think categories and adjust music tempo in retail space accordingly.

Practical Implications

For marketing practitioners, these findings suggest a differentiated approach to using music. This differentiated approach aligns with principles of sustainable marketing, where understanding evolutionary-based consumer responses to musical stimuli enables more ethical influence strategies that work with, rather than against, natural psychological processes (Saad, 2007). By respecting these innate responses, retailers can create environments that enhance well-being while achieving business objectives, contributing to more sustainable consumption patterns.

For Feel products, faster tempo (120 BPM) can encourage faster decision-making and potentially increase impulsive purchases, but with the risk of increased anxiety in some consumers. Testing different music tempos with the target market is recommended before implementation so that the role of consumers in co-creating value through music in retail space can be expressed in this way.

For Think products, the focus should be on other elements of the marketing mix as the music tempo shows minimal impact. Knöferle et al. (2023) showed that tonality (major

vs. minor) may be more important than tempo for certain contexts, suggesting that more complex musical elements deserve attention.

Retail environments should implement adaptive music systems that consider not only tempo but also customer density, time of day, and product mix. During peak hours, faster tempo can help manage customer flow, while slower tempo during quiet periods can extend browsing time. Care must be taken regarding product category so that music tempo does not negatively affect consumer decisions.

Research Limitations and Directions for Future Research

Several limitations should be acknowledged when interpreting the findings of this study, as they may affect the generalizability of our results. First, the small sample size ($N = 53$) limits statistical power for detecting smaller effects. Sun et al. (2023) used a 92-day experiment with thousands of observations, enabling them to detect more subtle patterns than our research may not have captured. Second, the lack of demographic data prevents analysis of how age, gender, or music preferences moderate tempo effects. Research shows that younger consumers show greater sensitivity to tempo manipulation, which could explain variability in our results. Third, the online format of the experiment meant lack of control over listening conditions. Factors such as sound quality, external distractions, and participant attention may have varied, potentially masking real effects. Laboratory experiments with controlled conditions could produce clearer results.

Future research should address the identified limitations through several approaches. Larger samples with detailed demographic data would enable segmented analysis of tempo effects. Laboratory experiments with controlled conditions and physiological measurements (EEG, skin conductance, eye tracking) could provide more objective measures of emotional and cognitive responses. Longitudinal studies could track consumer responses to tempo over time revealing whether tempo effects are lasting or diminish with repeated exposure. Using a qualitative approach to exploring music tempo on respondents' reaction would provide interesting insights that might lead to establishing new methodology for analyzing this phenomenon. Also, research on cultural differences in responses to tempo could inform global marketing strategies.

Finally, integration of machine learning and real-time analytics could enable development of algorithms that optimize music selection based on current store conditions and customer profiles, moving the field from static toward dynamic atmospheric strategies.

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MATIA TORBARINA, PhD, Assistant Professor
University of Rijeka, Faculty of Economics and Business
Department of Marketing
Ivan Filipovića 4, Rijeka, Croatia
matia.torbarina@efri.uniri.hr

JASMINA DLAČIĆ, PhD, Full Professor
University of Rijeka, Faculty of Economics and Business
Department of Marketing
Ivan Filipovića 4, Rijeka, Croatia
jasmina.dlacic@efri.uniri.hr

DORIS BRČINOVIĆ, mag.oec
University of Rijeka, Faculty of Economics and Business
Ivan Filipovića 4, Rijeka, Croatia
doris.brcinovic99@gmail.com