Background Music in Retail: When taking it slow may benefit you

Fabienne Krywuczky
PhD Candidate, Vrije Universiteit Amsterdam
Peeter Verlegh
Vrije Universiteit Amsterdam
Baris Kocaman
Vrije Universiteit Amsterdam

Cite as:
Krywuczky Fabienne, Verlegh Peeter, Kocaman Baris (2025), Background Music in Retail: When taking it slow may benefit you . *Proceedings of the European Marketing Academy*, 54th, (126256)

Paper from the 54th Annual EMAC Conference, Madrid, Spain, May 25-30, 2025

Background Music in Retail: when taking it slow may benefit you

Music is a critical atmospheric element retailers can leverage to shape consumer behavior. Music tempo in particular has been shown to impact consumer behavior, with initial studies suggesting *slower* music to be especially effective in boosting turnover across consumers. We propose that slower-tempo music (vs. faster-tempo) increases sales, particularly for loyal customers, who typically visit stores more often and are thus more exposed to the music played. We conducted the largest field experiment on music tempo to date, involving 140 stores in a large retail chain, we found no significant impact of tempo on overall turnover. However, slow-tempo music significantly increased sales among members of the retailer's loyalty program. These findings offer nuanced insights into the interplay between music and consumer loyalty, and call for a better understanding of how different consumer groups are impacted by in-store music.

Keywords: music tempo, retail atmosphere, membership
Track: Retailing & Omni-Channel Management

1. Introduction

Music is an important atmospheric element influencing consumers' shopping behavior (Yalch & Spangenberg, 1990). The type of music played in stores can impact customer satisfaction, as well as the time and money they spend (Garlin & Owen, 2006). Music tempo in particular has been shown to impact consumer behavior, with initial studies suggesting *slower* music to be especially effective in boosting turnover (Knoferle, Spangenberg, Herrmann, and Landwehr, 2012; Milliman, 1982). The current research aims to provide a more robust and comprehensive understanding of the effects of music tempo on turnover by i) conducting the largest field experiment to date and ii) shedding light on the type of customers that are most influenced by slow-tempo music. Specifically, we propose that slow (versus fast) music increases purchases, and that this effect is stronger for loyal customers.

Consumer behavior is affected by music tempo in various ways. Fast-tempo music tends to increase arousal and enhance the pleasure of the shopping experience (Anwar, Waqas, Zain, and Kee, 2020; Soh, Jayaraman, Choo, and Kiumarsi, 2015). However, faster music also appears to accelerate the pace of in-store traffic, leading customers to spend less time browsing (Milliman, 1982). In contrast, slow-tempo music has been linked to increased time spent in stores (Michel, Baumann, and Gayer, 2017). Notably, two studies so far have demonstrated the potential for slow music to boost turnover: Milliman (1982) found that in a single supermarket over a nine-week period, slow-tempo music led to higher turnover compared to fast-tempo music. More recently, Knoeferle et al. (2020) conducted a study across three department stores over a period of four weeks, revealing that slow music increased overall turnover, especially when the music had a sad tone. While these findings suggest slow music generally increases turnover across consumers, there is reason to believe that its impact may vary based on consumers' relationship and engagement with the store.

In the present research, we propose that slow music, as compared to fast music, increases turnover, and that this effect is stronger for loyal customers. Many retailers use membership programs to boost customer loyalty by offering exclusive promotions (Grewal, Levy, and Lehmann, 2004). These programs encourage more frequent store visits (Meyer-Waarden, 2008), increasing loyal customers' exposure to the store's ambiance – created partly by the music that is played. Previous research suggests that slow (as compared to fast) music creates a relaxing

shopping environment (Caldwell & Hibbert, 1999), which can lead consumers to spend more time browsing and ultimately increase their spending (Soh et al., 2015; Esfidani, Rafiei Samani, and Khanlari, 2022; Milliman 1982). Occasional shoppers, who may tend to focus on quickly locating specific items and thus spending less time in stores, may pay less attention to the music played. In contrast, loyal customers, drawn to explore new products and promotions, often spend more time in stores, making them more likely to notice and be influenced by the music played. Therefore, we expect that slow music will boost turnover, especially among loyal consumers. Formally: Slow-tempo (vs. fast-tempo) music increases turnover, and that this effect is stronger for loyal customers.

The current research makes several contributions. First, we are providing more robust insights into the effect of music tempo on turnover within the shopping context. As shown in Table 1, to date, only two field studies found support for the effect of slow music on turnover (i.e., Milliman, 1982; Knöferle et al., 2012), while one study found no effect of tempo (i.e., Herrington & Capella, 1996). Second, we are the first to explore whether the effect of music tempo increases turnover for a particular group of consumers. So far, all studies have generalized across consumers, showing music generally effects of music tempo on pleasure (Soh et al., 2015), time spent (Edfidani et al., 2022), or turnover (Milliman 1982; Knoferle et al., 2012) across all consumers. We are first to distinguish between customer bases by looking especially at how music impacts loyal consumers.

2. Context and Methods

We conducted a field experiment in collaboration with a beauty retailer, specializing in the sale of cosmetics, skincare, fragrances and other beauty products. The retailer operates a loyalty program that provides exclusive discounts, early access to product launches, and personalized recommendations. Customers can enroll in the program either online or in physical stores, with the program's benefits uniformly available across all store locations.[1]

[1] While the retailer also has an online shop, this aspect is beyond the scope of the study, as our focus is on the effects of in-store music tempo

Table 1: Field studies testing the effect of music tempo on sales.

Reference	Context	Size	Period	Effect on sales
Milliman (1982)	Supermarket	1 supermarket	9 weeks	Slow music increases sales
Herrington and Capella (1996)	Supermarket	1 Supermarket, 140 adult shoppers	-	Non-significant effect
Knöferle et al. (2012)	Retail	3 department stores	4 weeks	Slow music increases sales, especially for sad (vs. happy) music
Caldwell and Hibbert (1999)	Restaurant	62 restaurant customers, 1 restaurant	-	Slow music increases sales
Caldwell and Hibbert (2002)	Restaurant	62 restaurant customers, 1 restaurant	-	Slow music increases sales
Milliman (1986)	Restaurant	1,382 restaurant customers, 1 restaurant	Friday + Saturday, 8 weeks	
Sullivan (2002)	Restaurant	10 restaurant customer groups	-	Non-significant effect
This study	Retail	140 stores (retailer's entire presence in the Netherlands)	6 weeks	Slow music increases sales for members

The field experiment was conducted in 140 stores, covering retailer's entire presence in the Netherlands. These stores were assigned to one of two conditions: slow-tempo music or fast-tempo music.[2] To ensure consistency, playlists were specially designed by a professional music curation company, with all elements held constant except for the tempo.

To account for potential biases due to pre-existing differences in store characteristics and turnover, we combine stratification with a re-randomization approach (Morgan & Rubin, 2012). This process involved two steps. First, we stratified stores by type (high traffic, local core,

[2] Additionally, half of the stores were given the opportunity to select a playlist from a set of three (slow vs. fast, depending on assigned condition), while the other half were assigned automatically to one of three playlists. However, since this manipulation had no effects on our dependent variables we did not consider it further in our analysis and pooled the data across these two choice conditions, ending up with a one-factor design comparing fast- versus slow-tempo music.

premium, and regional core) as classified by the retailer for strategic purposes, ensuring an equal number of each store type in each condition. Second, within each stratum, we assigned an equal number of stores to each condition through re-randomization on the weekly turnover average during the same weeks as in the experimental period in the previous year (i.e., weeks 10 - 15 in 2023). This re-randomization process continued until the standard mean differences in pre-experiment turnovers between conditions were below 0.1, ensuring covariate balance and comparability across groups.[3] Ultimately, 70 stores were assigned to each condition.

The experiment took place over 6 weeks between March and April in 2024 (weeks 10 - 15). During this time, we collected data on two key sales metrics. The first was turnover, defined as the revenue generated by each store during the experimental period. The second metric was Member Sales Participation (MSP), which represents the sales attributed to members of the retailer's loyalty program. To maintain data confidentiality, the retailer indexed all Euro values by dividing them by a fixed number.

To test our hypotheses, we employed a regression framework. Unlike t-tests, which assume complete randomization, regression accounts for the stratified re-randomized assignment procedure and avoids overly conservative p-values for the music tempo effect (Morgan & Rubin, 2012). Specifically, we fit the following linear regression model including re-randomization covariates:

$$Turnover_i = \alpha + \beta D_i + \theta Type_i + \gamma PastTurnover_i + \epsilon_i \quad (1)$$

where $Turnover_i$ denotes the weekly turnover average for the weeks of the experimental period store i, D_i is equal to 1 if store i is in the fast tempo condition and zero otherwise. Our coefficient of interest is β, which represents the additive effect of slow music over the fast music condition. We also control for the variables used in the stratified rerandomization procedure. Namely, $Type_i$ controls for the store type differences and $PastTurnover_i$ controls for turnover baseline in weeks 10 - 15 in 2023. Finally ϵ_i is a mean-zero error term. The model equation for MSP replaces $Turnover_i$ with MSP_i in Equation 1.

[3] In effect this procedure resulted in standardized mean differences ranging from 0.0003 to 0.03.

3. Results

We report the regression results for turnover and MSP in Table 2[4]. For turnover (Column 1), we observe a negative mean estimate for slow tempo although this is not statistically significant (M = -7.311, p = 0.670). For MSP, we find a positive and significant mean difference between the slow and the fast tempo *(*M = 3.567, p = 0.013). Hence, while there is no evidence of a tempo effect on the overall turnover, a slow tempo increases turnover from members significantly compared to a fast tempo. This result suggests that music affects sales only for a particular group of customers based on their membership status.

Table 2: Regression results for turnover and MSP

	(1)DV: Weekly turnover average			**(2)DV: Weekly MSP average**		
	Mean	**SE**	**p**	**Mean**	**SE**	**p**
Intercept	489.362**	28.876	< .001	91.904***	2.401	< .001
Tempo: Slow (Base: Fast)	-7.311	17.129	.670	3.567*	1.424	.013
Past turnover	0.060	0.072	.407	-0.014*	0.006	.019
Type: Local Core (Base: High-traffic)	-293.480***	23.952	< .001	14.837***	1.991	<.001
Type: Premium (Base: High-traffic)	-279.014***	35.512	< .001	21.102***	2.953	< .001
Type: Regional Core (Base: High-traffic)	-276.464***	26.484	< .001	11.931***	2.202	< .001
# observations	140			140		
R^2	0.552			0.386		
Adjusted R^2	0.535			0.363		

Notes: * p<0.05, ** p<0.01, *** p<0.001. Past turnover is the weekly turnover average across weeks 10 – 15 in 2023. Heteroskedasticity robust standard errors.

[4] We also run similar regressions for average turnover per customer and the number of new memberships but excluded the results for space concerns.

3.1 Robustness check

To check the robustness of our results, we reanalyzed the data using a difference-in-differences (DID) framework. In retail settings, various unobserved factors—such as customer foot traffic and local holidays—can significantly influence sales. Despite our carefully designed condition assignment procedure, these factors could still impact the outcomes. To alleviate these concerns, we gathered additional pre-experiment data on turnover and MSP three weeks preceding the experiment period (weeks 7-9)[5] and combine it with the corresponding data in experiment weeks in the previous year (weeks 10-15 in 2023) and the data from the field experiment (weeks 10-15 2024) Ultimately, for the analysis,. we used a panel on weekly turnover and MSP representing these weeks to control comprehensively for unobserved differences between stores assigned to the slow-tempo and fast-tempo conditions. Additionally, we incorporated store fixed effects into the analysis to further mitigate potential biases arising from time-invariant store-specific characteristics. Specifically to estimate the causal effect of slow-tempo versus fast-tempo music on sales, we specified and fit a two-way fixed effects regression model:

$$Turnover_{it} = \alpha_i + \beta D_i + \theta Post_t + \gamma D_i * Post_t + \epsilon_{it} \quad (2)$$

where $Turnover_{it}$ denotes the weekly turnover for the week *t* in store *i*, D_i is the same tempo condition indicator as specified in Equation 1, and $Post_t$, is a binary indicator for the experimental period, taking the value 1 for weeks 10–15 in 2024 and 0 otherwise. Our primary coefficient of interest, γ, captures the effect of slow-tempo music relative to fast-tempo music. Additionally, we include store fixed effects (α_i) to account for time-invariant differences across stores.

Table 3 summarizes the results from the DID robustness analysis. The findings are in line with the regression results discussed above, and reveal an insignificant mean estimate for general turnover (Column 1) and a positive, statistically significant mean estimate for MSP. Based on these results, we confirm the robustness of our conclusions.

[5] We also include this period in addition to others to gain better control of time trends at a time closer to our field experiment.

Table 3: DID robustness analysis

	(1)DV: Turnover (weekly)			(2)DV: MSP (weekly)		
	Mean	**SE**	**p**	**Mean**	**SE**	**p**
Post 1	20.128	15.136	.186	-4.047***	1.169	< .001
Post: 1 x Tempo: Slow	-25.103	21.144	.237	3.686*	1.537	.018
Store fixed effects		Included			Included	
# observations		2,100			2,100	
# stores		140			140	
R^2		0.522			.378	
Adjusted R^2		0.487			0.333	

Notes: * p < 0.05, ** p < 0.01, *** p < 0.001. Store-clustered standard errors.

4. General Discussion

While prior studies suggested that slower music increased overall turnover (Knoeferle et al., 2012; Milliman, 1982), the current study—the largest field experiment ever conducted to examine the effect of tempo on sales—reveals a more nuanced finding. Slow music, compared to fast music, affects sales only for a particular group of customers, namely loyal consumers; No evidence was found that tempo influences overall turnover; however, slower music did increase sales among consumers with a loyalty-program membership.

Our findings raise questions about why loyal consumers are more affected by music tempo. Initial research suggests that slow-tempo music slows consumers' pace as they move through stores (Milliman, 1982), encouraging them to browse more, notice additional products, and ultimately purchase more (Knoeferle et al., 2012; Milliman, 1982). However, since loyal consumers are likely already spending more time in stores than less loyal consumers, alternative explanations may account for why slow music particularly increases turnover among loyal customers.

One possible explanation is that loyal consumers may form stronger associations between a store and its ambience. Because they visit the store more frequently (Meyer-Waarden, 2008), the store's atmosphere, including its music, may become a more prominent part of their overall

perception of the shopping experience. For loyal consumers, the relaxing effect of slow music might enhance this positive perception, reinforcing their sense of the store as a pleasant place to shop. This stronger association could predispose loyal customers to feel more inclined to spend time and money in the store.

Alternatively, the effect may stem from differences in the mindset with which loyal versus less loyal consumers approach the store. Less loyal consumers might have a task-oriented mindset, focusing on quickly finding specific items and leaving. For them, background music may have little influence on their behavior, as their primary goal overshadows its effects. In contrast, loyal consumers may enter with an exploratory mindset, more open to discovering new products and enjoying the shopping experience. In this case, slow-tempo music might align better with their relaxed, exploratory mood, amplifying their enjoyment and increasing their purchases. Future research is needed to better understand why loyal consumers are more affected by music tempo.

5. References

Anwar, A., Waqas, A., Zain, H. M., & Kee, D. M. H. (2020). Impact of music and colour on customers' emotional states: An experimental study of online store. *Asian Journal of Business Research, 10*(1), 104-125.

Caldwell, C., & Hibbert, S. A. (1999). Play that one again: The effect of music tempo on consumer behaviour in a restaurant. *European Advances in Consumer Research, 4*, 58-62

Esfidani, M. R., Rafiei Samani, S., & Khanlari, A. (2022). Music and consumer behavior in chain stores: theoretical explanation and empirical evidence. *The International Review of Retail, Distribution and Consumer Research, 32*(3), 331-348.

Garlin, F. V., & Owen, K. (2006). Setting the tone with the tune: A meta-analytic review of the effects of background music in retail settings. *Journal of business research, 59*(6), 755-764.

Grewal, D., Levy, M., & Lehmann, D. R. (2004). Retail branding and customer loyalty: an overview. *Journal of retailing, 4*(80), ix-xii.

Knoferle, K. M., Spangenberg, E. R., Herrmann, A., & Landwehr, J. R. (2012). It is all in the mix: The interactive effect of music tempo and mode on in-store sales. *Marketing Letters*, *23*, 325-337.

Meyer-Waarden, L. (2008). The influence of loyalty programme membership on customer purchase behaviour. *European Journal of marketing*, *42*(1/2), 87-114.

Michel, A., Baumann, C., & Gayer, L. (2017). Thank you for the music–or not? The effects of in-store music in service settings. *Journal of retailing and consumer services*, *36*, 21-32.

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

Morgan, K. L., & Rubin, D. B. (2012). Rerandomization to improve covariate balance in experiments. *The Annals of Statistics*, *40*(2), 1263–1282.

Soh, K. L., Jayaraman, K., Choo, L. P., & Kiumarsi, S. (2015). The impact of background music on the duration of consumer stay at stores: an empirical study in Malaysia. *International Journal of Business and Society*, *16*(2).

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.