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Effects of employees' opportunities to influence in-store music on sales: Evidence from a field experiment

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The effects of in-store music on consumer behavior have attracted much attention in the marketing literature, but surprisingly few studies have investigated in-store music in relation to employees. Conducting a large-scale field experiment in eight Filippa K fashion stores in Stockholm, Sweden, we investigate whether it is beneficial for store owners to give employees more opportunities to influence the in-store music. The experiment lasted 56 weeks, and the stores were randomly assigned into a treatment group and a control group, with the employees in the treatment stores having the opportunity to influence the in-store music through an app developed by Soundtrack Your Brand (SYB). The results from the experiment show that sales decreased by, on average, 6% in treatment stores when employees had the opportunity to influence the music played in the store. Interviews revealed that employees frequently changed songs, preferred to play high-intensity songs, and had diverse music preferences that were not congruent with the brand values of the company. Our results thus imply that employees choose music that suits their preferences rather than based on what is optimal for the store, suggesting that store owners might want to limit their opportunities to influence the background music in stores.

Keywords: Background music; Brand-fit music; Music tempo; Consumer behavior; Job satisfaction; Atmospheric cues; Work environment; Field experiment

JEL-codes: C93, D22, L81, M54, M31

1. Introduction

Already in 1915, Thomas Edison tested whether music could be used to increase the productivity of his factory workers. He reportedly found no effects, perhaps because of the noisy work environment and the poor sound quality at that time (Kellaris, 2008). Since then, the effects of in-store music have attracted much attention in the marketing literature (for overviews, see, e.g., Hargreaves & North, 1997; Kellaris, 2008; and Yorkston, 2010). These studies have almost exclusively focused on how in-store music affects consumers, for example, by studying the effects of music presence (Garlin & Owen, 2006), music choice (Areni & Kim, 1993; North et al., 1999; Wilson, 2003), music tempo (Milliman, 1982, 1986; Oakes, 2003), brand-fit music (Beverland et al., 2006; Daunfeldt et al., 2017), and the interaction of music with other sensory cues in the store environment (Mattila & Wirtz, 2001).

Surprisingly, few studies have investigated in-store music in relation to employees. This lack of research is puzzling considering that music can be an important factor for well-being and the working environment (Shih et al., 2012). On the one hand, an increased opportunity for employees to influence in-store music could make them more satisfied and service oriented and therefore increase sales, lead to more satisfied customers and improve the image of the brand. On the other hand, businesses may be afraid that their staff will make suboptimal choices that will result in lower sales and less satisfied customers.

We conducted a field experiment, as well as interviews, in eight Filippa K stores to test whether and how sales are affected by the opportunities for employees to influence in-store music. Filippa K is a Swedish retail chain with over 700 fashion stores in 17 countries that sells classic clothes with a modern and minimalist design. We randomly selected stores into a treatment group, where the staff had the opportunity to influence the in-store music, and a control group, where the employees had no such opportunities. To reduce geographical heterogeneity and to facilitate identifying the effects of the experiment, all stores in the experiment are located in Stockholm, Sweden.

The in-store soundtrack that we use in the experiment was developed by music curators at Soundtrack Your Brand (SYB), and the songs were selected to reflect the chain's brand values. The difference between the stores in the treatment group and the control group is that SYB developed an app that could be used by the employees in the treatment stores, while no such app was introduced in the control stores. The app made it possible for employees to change the volume of songs, skip songs, share songs with consumers, and choose between a soundtrack with high-intensity or medium-intensity songs. In all other ways, the soundtracks were controlled from SYB’s headquarters in Stockholm, limiting the risk of noncompliance problems.

The experiment lasted 56 weeks, and data were also gathered during the 22 weeks before the experimental period. The scale of our study differs from most previous studies on in-store music, which tend to be based on field experiments that cover one store (Areni & Kim, 1993; North et al., 1999), restaurant (Wilson, 2003), coffee shop (North & Hargreaves, 1996), or shopping mall (Yalcht & Spangenberg, 1990) during a very short experimental period (usually a week). Due to the use of a few stores and the short study period, the results might have been driven by store-specific or time-specific conditions, thus limiting the ability to draw causal inferences based on these experiments.

We investigate the effect of the field experiment on sales by estimating a difference-in-differences regression model that controls for time-specific effects and time-invariant differences between the treatment and control stores. The results show that the opportunity for employees to influence in-store music decreased sales by, on average, 6%. The negative effect was most pronounced for sales of women's clothing, which showed a decrease in sales of 11%. We find no significant effect on sales of men's clothing, although the estimated coefficient is negative. Thus, it seems beneficial for store owners to limit the opportunities for employees to influence in-store music.

Thirteen semistructured interviews with employees at the Filippa K stores in the experiment showed that the employees had very different music preferences, that they were unaware of how the in-store music was linked with the brand values of the company, and that they generally took the opportunity to influence the music that was played in the stores. In particular, employees tended to prefer the high-intensity soundtrack, although previous research (Garlin & Owen, 2006) has indicated that a high music tempo might reduce the time spent in stores and sales. These results imply that store owners might need to educate their employees in the music strategy of the company or even think about music preferences when recruiting employees if they want to give employees the opportunity to influence the music played in stores.

The remainder of this paper is structured as follows: A literature review on the effects of in-store music is presented in the next section. Our experiment is explained in detail in Section 3. The empirical model and our estimation results follow in Section 4. Finally, our results are summarized and discussed in Section 5.

2. The effect of in-store music: a literature review

Music is one of the environmental factors or atmospheric cues that affect not only image, but also behaviors (Bitner, 1992; Bruner, 1990; Helmefalk, 2017; Mari & Poggesi, 2013; Turley & Milliman, 2000). The marketing literature has addressed not only how music, in terms of tempo and volume,

may affect how long a customer stays in a store and the amount spent but also whether the genre fits with customers (and customer preferences) or alienates them (Hui, Dubé, & Chebat, 1997; Mattila & Wirtz, 2001; Milliman, 1982; Milliman, 1986) and whether the music creates a fit with other values and cues exposed to customers (Biswas et al., 2014). It has also been acknowledged that music affects customer perceptions, such as the amount of time that customers believe that they have spent in a store and the amount of time spent waiting that customers express (cf. Baker, Parasuraman, Grewal, & Voss, 2002; MacInnis & Park, 1991), while the mode and intention of shopping also impact how customers experience music.

In the right combination, expressed as pleasantness in the literature, music positively affects behavior and increases customer purchases (Morrison, Gan, Dubelaar, & Oppewal, 2011). In a meta-analysis on research on the effect of in-store music on customers, Garlin & Owen (2006) summarize research by pointing out how music (rather than silence) creates a feeling of pleasure and benevolence (cf. Andersson, Kristensson, Wästlund, & Gustafsson, 2012); how music that is familiar and preferred positively affects benevolence; how a slower tempo, a lower volume and familiar music lead customers to stay in stores for longer periods of time, while a higher volume and tempo and music that does not meet the taste of customers causes customers' perception of time to be longer than the actual time passed; and how according to the summarized research, tempo has the highest impact.

In research on work environments, scholars have pointed out how the physical setting affects job satisfaction, productivity, and motivation (Sundstrom & Sundstrom, 1986). Skandrani, Dahmane Mouelhi, & Malek (2011) investigate atmospheric cues in stores to determine their effect on employee attitudes and behaviors. Related to music specifically, they find that employees prefer music over silence, that music decreases employee's feelings of boredom, and that familiar music or music employees like increases their performance and motivation. A lack of variation (in songs and rhythms) and incongruence with the time of day negatively affect employees. In a study by Kniffin, Yan, Wansink, & Schulze(2017), the positive influence of music is shown in terms of willingness to cooperate, while Korczynski (2003), who provides a historical overview, attempts to explain how managers may have had a negative idea about music in the workplace.

Bitner (1992) made an early attempt to link research on what she refers to as the impact of physical surroundings on customers and employees, thus adopting a broader set of stimuli than music alone. In such studies, which are normally linked to service encounters, the employee and music are mostly treated as independent variables to explain customer attitudes and behaviors. Levy & Grewal (1993), for instance, point out the interaction between ambient factors of music and light and how the number

of and friendliness of employees affect customers' purchase likelihood. There are also suggestions about how music affects how employees are perceived by customers (Morin, Dube, & Chebat, 2007), and while the effect on employee behavior and the link to customer attitudes and behaviors are rarely present, there is one exception suggesting that dance music causes employees to start dancing, thus scaring off customers.

3. The experiment and research design

To test the effects of in-store music on employees, we conducted a field experiment in eight Filippa K fashion stores in Stockholm, Sweden. The background music was supplied by SYB, which created a soundtrack that was supposed to be congruent with the brand values of the company. More specifically, the in-store music at Filippa K was selected to signal the following brand values: (i) exclusive, (ii) elegant, (iii) innovative and forward thinking, (iv) expressive, and (v) nonexplicit.

Regarding elegant music, examples may include songs that are light, airy and shimmering; the opposite of elegant music is rugged music, which has a rougher and more robust sound. Innovative music represents the sound of tomorrow, where styles and genres are mixed; in this regard, conventional and classic songs are the opposite, i.e., no surprises, and thus, such songs should be avoided in Filippa K stores. Expressive music is music that stands out, i.e., music that is catchy. Every fifth song is something that is slightly different, making the soundtrack more expressive and interesting. Nonexplicit music is low-key background music.

The eight stores in the experiment were randomly selected into four treatment stores and four control stores. The difference between the stores in the experiment is that SYB created an app so that the employees in the treatment stores could influence the in-store music during the experimental period, while the staff at the control stores did not have this opportunity. More specifically, the staff at the treatment stores had the opportunity to influence the in-store music by (i) adjusting the volume, (ii) skipping songs, (iii) sharing songs with customers, and (iv) choosing a soundtrack with high-intensity songs or medium-intensity songs.

The experimental period started on July 5, 2016, and ended on August 1, 2017, which means that the experiment lasted over 56 weeks. We also gathered data during the 22 weeks before the experimental period, starting on February 1, 2016. Our experimental design means that we can compare sales in the treatment stored during the experimental period with sales in the pretreatment period and in the control stores during the experimental period. Thus, we have a much larger dataset than that in most previous studies, making causal inferences more convincing. In all other ways, apart from the

differences noted above that were part of the experiment, the soundtracks were controlled from SYB's headquarters. In other words, employees could not influence the choice of songs in the soundtrack during the experimental and control periods, nor could they make any changes other than those that the app allowed. This aspect of the experimental design limits the possibility of noncompliance problems, which is otherwise a common feature in field experiments (Krueger, 1999; Ortmann, 2005; Duflo et al., 2007).

4. Empirical analysis

4.1 Regression model and descriptive analysis

We investigate whether the opportunity for employees to influence in-store music affected sales by estimating four different models. First, we estimate the following basic difference-in-differences model:

$$ln\ Sales_{i,t} = \alpha_0 + \beta_1\ tp_t + \beta_2\ tg_{i,t} + \beta_3\ (tp_t \times tg_{i,t}) + \varepsilon_{i,t} \qquad [1]$$

where $ln\ Sales_{i,t}$ is daily sales in store i on day t, expressed in natural logarithms. There are two reasons for expressing the outcome variable in logarithmic form. First, the variable becomes approximately normally distributed, which is good for drawing statistical inferences. Second, it yields a semi-elastic model in which the estimated treatment effects can be interpreted as percentage changes.[1] tp_t is an indicator variable equal to one during the treatment period and zero otherwise; and $tg_{i,t}$ is an indicator variable equal to one for stores belonging to the treatment group and zero otherwise. The primary variable of interest in equation (1) is the interaction term ($tp_t \times tg_{i,t}$). The parameter β_3 measures the percentage change in sales in the treatment stores when the experiment is introduced compared to sales in the same stores in the pretreatment period and stores in the control group over the whole study period. In applied research, this type of difference-in-differences estimator is one of the most frequently used tools for evaluating the effects of interventions on the relevant outcome variables (Abadie, 2005).

We also estimate more general models that include firm-level fixed effects, time-level fixed effects, and both. In other words, we now also control for possible store- or time-level heterogeneity within the treatment and control groups and/or within the control or intervention period. The most general model that we estimate is as follows:

[1] The exact effect in percentage terms of a parameter estimate β_3 can be calculated using the formula $100 \times [\exp(\beta_3) - 1]$. However, since the parameter estimates in our setting are small, the differences are negligible.

$$ln\ Sales_{i,t} = \alpha_i + \alpha_t + \beta_3\ (tp_t \times tg_{i,t}) + \varepsilon_{i,t} \quad [2]$$

where α_i are store-specific fixed effects, and α_t are date-specific fixed effects. The store-specific fixed effects control for possible heterogeneity among stores in both the treatment and control groups that could affect sales. Such variables include store-specific management skills, store location, and opening hours, given that they are (at least roughly) constant during the study period. The date-specific fixed effects control for all day-to-day heterogeneity, which could affect the level of sales. Examples include not only payday effects, weather, and chain-specific marketing campaigns but also long-term changes in business climate, such as recessions.

An unbiased identification of the effects of the experiment using difference-in-differences models requires that the treatment and control group stores have parallel trends in the outcome variable in the absence of treatment. Of course, such trends are impossible to empirically observe since a store that receives the intervention cannot then also be observed in the counterfactual state of not having received that intervention. Instead, most researchers plot pretreatment trends in the outcome variable to gain an idea of how plausible the identification assumption is in the case at hand. Such trends (based on a sales index where the average sales over all included stores during the pretreatment months is used as the base) are presented for the pretreatment period from February 2016 to June 2016 in Figure 1.

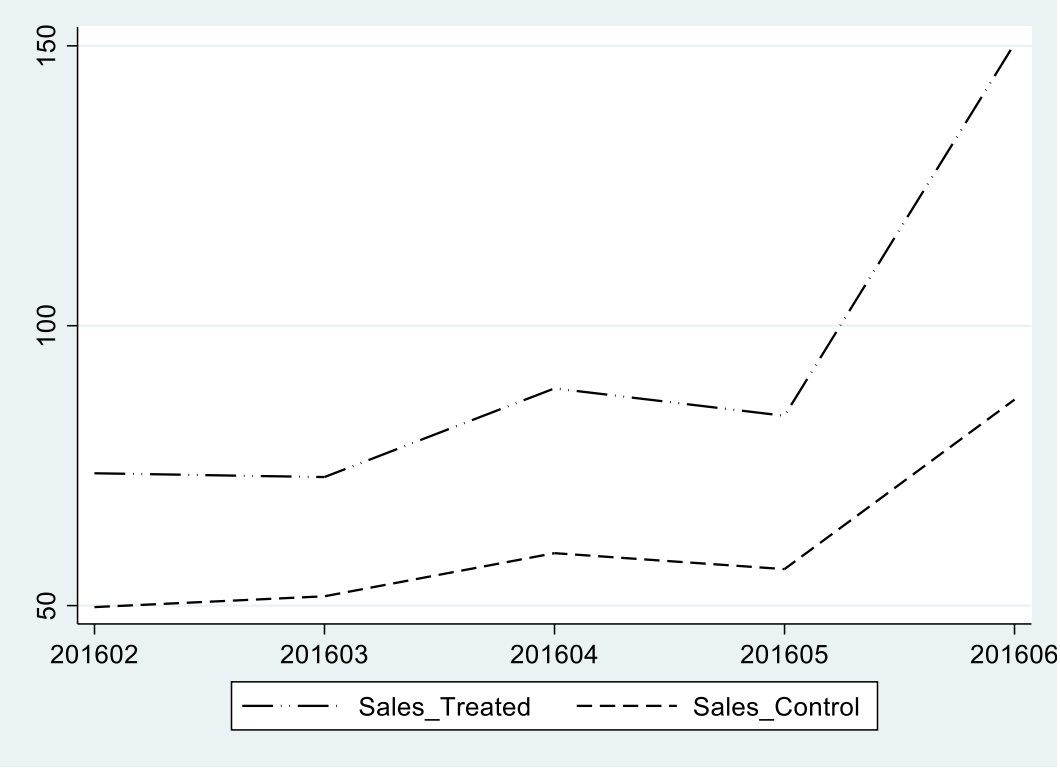

Figure 1. Pretreatment trends of the clothing sales index.

The trends are nearly parallel throughout the first four months of the pretreatment period, but sales are at a higher level in the treatment group stores. In the regressions, this difference is captured by the treatment group indicator variable, that is, the store-specific fixed effects in our more general models, and therefore does not cause any bias in the estimate of the treatment effect. The last pretreatment month, June 2016, coincides with the summer sale in Swedish clothing stores, and the sale seems to have had somewhat more of an impact on the treatment stores than on the control stores.[2] Since the summer sale is a chain-wide event, the average impact of the summer sale will be controlled for by the inclusion of the date-specific fixed effects in the regression. Note, however, that our results will be biased upwards if there are remaining differences in trends between the treatment and control stores that are not accounted for by the date-specific fixed effects in coming periods had the experiment not been implemented, i.e., we will then be more likely to observe a positive sales effect that is due to these differences in trends rather than due to the experiment.

Descriptive statistics regarding sales and the specific variables included in the estimation of equations (1) and (2) are presented in Table 1.

Table 1: Descriptive statistics; the data include both female and male clothing sales.

Variable	Mean	SD	Definition
Sales	100.00	94.33	Average sales index per day.
Sales, TP = 0	99.86	97.70	Average sales index per day before the experimental period.
Sales, TP = 1	101.95	93.04	Average sales index per day during the experimental period.
Sales, TG = 0	75.53	71.29	Average sales index per day for stores belonging to the control group.
Sales, TG = 1	132.57	108.38	Average sales index per day for stores belonging to the intervention group.
$tp_t \times tg_i$	0.32	0.46	Interaction between tp and tg. Measures the effect of the treatment on the treated stores.
tp_t	0.71	0.45	An indicator variable equal to one during the treatment period and zero otherwise.
$tg_{i,t}$	0.45	0.50	An indicator variable equal to one if the store belongs to the treatment group and zero otherwise.

Note: The descriptive statistics are based on the final sample used in the main regression analysis.

Because the retail chain wants to keep its sales information confidential, we are not allowed to present average revenues. Therefore, in the descriptive statistics, the means have been converted into indexes with the mean of all stores over the whole study period as a base being equal to 100. All means are

[2] Since we also perform the estimations when the full dataset is divided into sales of women's clothing and men's clothing, the graphs for these datasets are presented in Figures A1:1 and A1:2 in Appendix 1. Once again, the graphs show that for most of the pre-treatment period, the trends are clearly parallel; once again, however, the impact of the summer sale in June seems to be more pronounced for the treatment group stores than for the control group stores.

thus presented in comparison to this base value, and it is easy to see the differences between the intervention and control stores and before and after the introduction of the experiment. We do not present any information that would make it possible to infer average sales levels in the tables or graphs. For the same reason, the constants are not presented in the tables that report our regression results.

The average sales in the stores included in the dataset are fairly constant over time. During the pretreatment period, the average sales index was 99.86, while in the posttreatment period, the index was 101.95. The differences are more pronounced in regard to average sales in the treatment and control group stores, with an average sales index for the treatment group stores of 132.57 and an average sales index for the control group stores of 75.29. Thus, these results are similar to the numbers presented in Figure 1, which also clearly indicate a higher level of sales in the treatment group stores.

4.2 Results

The estimation results for four different models are presented in Table 2. Model 1 corresponds to equation (1), while model 4 corresponds to equation (2). Based on goodness of fit, the results from model 4 are preferred, and the results from the estimation of these models are those discussed in the text unless otherwise mentioned.

Studying total sales, regardless of whether the goods sold are women's or men's clothing, we find that the experiment reduced sales in the treatment stores by 6%. This effect is driven by a reduction in sales of women's clothing of 11%; we find no significant effects of the experiment on sales of men's clothing. Thus, giving employees the opportunity to affect the music in the store reduces sales. This result has many possible explanations. First, the data on the usage of the app for controlling the music show that the app is frequently used during the day, and it could be that employees use the app rather than attend to their customers. Another possible explanation is that employees might not use music in the store in a manner suited to increasing sales, for example, by playing music that is too loud or high-intensity songs during the wrong time of day.

Table 2: Estimation results, dependent variable *ln Sales*$_{i,t}$.

	Total sales				Women's clothing sales				Men's clothing sales			
	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4	Model 1	Model 2	Model 3	Model 4
$tp_t \times tg_i$	-0.05	-0.05	-0.05	-0.06*	-0.10	-0.10*	-0.11*	-0.11**	-0.03	-0.05	-0.04	-0.06
	(0.05)	(0.05)	(0.05)	(0.04)	(0.06)	(0.06)	(0.06)	(0.05)	(0.07)	(0.06)	(0.07)	(0.05)
tp_t	0.05	0.05	-	-	0.12***	0.12***	-	-	0.02	0.04	-	-
	(0.04)	(0.03)	-	-	(0.05)	(0.04)	-	-	(0.06)	(0.04)	-	-
$tg_{i,t}$	0.70***	-	0.70***	-	0.39***	-	0.40***	-	0.30***	-	0.30***	-
	(0.04)	-	(0.04)	-	(0.05)	-	(0.05)	-	(0.06)	-	(0.06)	-
TG indicator.	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
TP indicator.	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes	No	No
Store f.e.	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
Date f.e.	No	No	Yes	Yes	No	No	Yes	Yes	No	No	Yes	Yes
Observations	4,626	4,626	4,626	4,626	3,665	3,665	3,665	3,665	3,511	3,511	3,511	3,511
R-squared	0.13	0.41	0.37	0.65	0.03	0.30	0.32	0.59	0.02	0.34	0.30	0.66

Note: ** statistically significant at the 5% level; * statistically significant at the 10% level. Heteroskedasticity robust standard errors are in parentheses. The TG indicator is an indicator variable equal to one for treatment group stores, while the TP indicator is an indicator variable equal to one for observations during the treatment period. Store f.e. indicates that the regression is performed using store-specific fixed effects, while Date f.e. indicates that date-specific fixed effects are used.

We also perform placebo testing by randomly assigning treatment to what are in fact nontreatment time periods. These tests are performed in the following way. First, we randomly assigned two of the five pretreatment months as having been months where treatment was given. By means of a random draw without replacement, months 3 and 5, i.e., April and June, were assigned to be fake treatment months, while February, March and May remained controls. In the next step, we re-estimated equation (2), i.e., our most general model. The results are presented in Table 3, showing that none of the treatment effects in our placebo estimation are statistically significant, providing further evidence that our estimated effects are due to the treatment given and not some random artifact.

Table 3. Estimation results, placebo tests, dependent variable *ln Sales*$_{i,t}$.

Variables	All	Female	Male
$tp_t \times tg_i$	0.02	0.03	0.002
	(0.07)	(0.09)	(0.08)
Store f.e.	Yes	Yes	Yes
Day f.e.	Yes	Yes	Yes
Observations	1,288	1,019	969
R-squared	0.58	0.58	0.66

Finally, we investigate whether the effect of the music treatment on sales is roughly constant over time, which we would expect because the change in the store environment was a one-time shift and not implemented over time. Finding that there is a trend in the effect of the change in store environment on sales would also make us question whether the estimated effects are due to the treatment given. The results when we estimate the treatment effect after 3, 5 and 8 months, as well for the whole treatment period, are presented in Table A2 in the appendix. The results confirm that the effects of the treatment are constant over time, lending further credibility to the notion that the observed effects are due to the changes made in the store environment.

4.3 Staff interviews

To gain a deeper understanding of the results, semistructured interviews were conducted with 13 employees (3 men and 10 women) in six stores. The aim of the interviews was to provide the staff with an opportunity to reflect on the soundtrack, their own personal experiences of the app and the increased opportunity to influence the music played in the store. All interviews were conducted in Swedish, and the average length of the interviews was approximately 20 minutes. The interview guide has been translated into English and is presented in Appendix 3.

The previous literature indicates that there is an optimal level of stimulation depending on personal characteristics, which means that it differs between employees (Bruner, 1990; Herrington & Capella, 1994; North & Hargreaves, 1996). A number of studies have indicated that, for example, the effect of music depends on whether the individual has an extroverted or introverted personality (Daoussis, 1986; Furnham and Bradley, 1997; Furnham et al., 1999; Ylias and Heaven, 2003; Cassidy and MacDonald, 2007). Extroverts generally listen to music more often than introverts (Daoussis, 1986), and they are less affected by music than introverts when completing tasks (Furnham and Bradley, 1997).

The interviews showed that the employees had very different music preferences and ideas about what type of music should be played in the stores. This is based on statements regarding not only the music preferred in the store but also who should select the music and whether the music played was related to personal preferences or what would fit best with the store or its customers. Some employees preferred to influence the type of music to be played while still realizing the need for the music to conceptually fit with the store. These employees also stated how the choice of music affected them in their work, relating the music to intensity (music that is too slow) and repetition (the same songs being played several times). Meanwhile, other employees preferred central (not store-level) decisions on music but were equally opinionated about the music played in the stores. They were inclined to mentally block the music and appreciated silence more. Both groups of employees seemed to prefer instrumental music to music with lyrics, with the group preferring music with lyrics being more concerned about inappropriate lyrics in the ears of customers.

In a sense, Filippa K's music strategy is quite broad, captured by the keywords elegant, innovative and forward thinking, expressive and subdued. Once again, this breadth caused opinions about the fit of the music and what the music really stands for. When asked about what fits with the store, the interviewees seemed to suggest quite a variety of music, and they criticized some of the current music for not fitting with the store. The interviews seemed to imply that in regard to what fits, the interviewees tended to express personal preferences: For instance, someone with a taste in music for jazz would prefer jazz music. Once again, there was an overall tendency to prefer upbeat, happy music rather than soft music. Employees with strong opinions on the in-store music talked about how it affected not only their work mood but also their treatment of customers: "It affects how I act towards the customers, the energy level". (Interviewee VII).

In terms of brand image, there is also the discussion about whether the music is primarily aimed at customer preferences or whether it aims to reflect the brand. That is, there may be discrepancies

between the two; customers' music preferences may be different from the music strategy of the store, and therefore, this difference may be intentional, as the store may want to communicate specific values through the music. The interviewees were concerned about such differences. Specifically, there seemed to be a concern with the broad age group that Filippa K serves. Here, the individual stores, based on their locations, may well be directed at or serve somewhat different customer clienteles, primarily varying by age group. In other words, the interviewees may have had somewhat different perceptions about what music fitted the store and, more importantly, what music did not.

The experiment above focused on employees' adjustment of music in the store. The interviews highlight how employees' adjustment of music was mostly explained in terms of adjusting to customers: Changes to music followed from the number of customers in the store and the time of day. As stated by one of the interviewees, "On rainy Sundays, then nonstress music fits better, music that creates that feeling that there is room for everyone to shop… Shopping does not have to be a party every time" (Interviewee IV). As stated by another interviewee in regard to skipping songs, this happened to adjust the intensity of the music to the number of customers; a store with many customers required up-tempo music, which meant that slow songs were skipped: "when the song is too slow, while there are many customers in the store" (Interviewee I). The same interviewee continues, "You can raise the volume when the store is really full. Like today, during the event this morning, we played really loud, there were lots of people, and it went well". Therefore, the adjustments are basically about changing to more intense songs or adjusting the volume up and down, with a higher volume and intensity being linked to more customers in the store or more hectic times of the week (see the quotation about Sundays above compared to busy weekdays, when people have less time to relax). Additionally, sales and the season affected music choices, with sales – as with the busy hours – thus being connected to a higher intensity and volume, while the season is linked more to the type of music.

Adjustments were also made – in terms of volume and in the selection of songs – for various parts of the stores. Specifically, inappropriate lyrics were considered critical in regard to the fitting rooms,, for which there was a preference for a somewhat higher volume and feel-good songs. In these cases, the music was adjusted when the employees saw someone entering the fitting room area, and attempts were also focused on directing speakers so that the volume would be different there.

Furthermore, music was thought to attract people into the store, leading to adjustments in terms of the selection of songs: "When it feels like the store is too empty, then it is nice to turn on a song to tempt people to enter the store" (Interviewee II). However, as stated by a different employee, it is

more common that the music is adjusted to those who are in the store than to make people enter: “I would say that with a lot of customers in the store, we increase the volume and the intensity. You realize that the pace changes, and the customers become more alert. But, obviously, the flow is already there at that point. We adjust the music to the flow, rather than choosing upbeat music and then the customers come” (Interviewee X).

In addition to arguments about songs being adjusted to the number of customers in the store, the time of day and week, the season, sales and attempts to draw customers into the store, the employees also changed the volume or songs depending on their own mood and preferences, which were often related to the intensity being too low or the rhythms too repetitive for their taste. “It affects our mood. In the afternoons, when you are tired and you’ve been delivering the entire day and something comes along that is too AW in style, then it happens that we skip the song. Or if you feel like ‘I don’t want to hear this song again’, then you also skip it. It does not happen frequently” (Interviewee VII). The preferences always seemed to be for a higher volume and a higher tempo, as stated by one of the interviewees: “It is really strange if you enter a store with very soft music but that is crowded with hundreds of people. Then, I change. As I said, I never change downwards, only upwards” (Interviewee III). Similar stories are told by others: “There may be a song that does not fit; something that doesn’t make you thrive; then, I skip the song” (Interviewee V). Lastly, there also seemed to be a matter of being liked through choosing songs that customers liked: “Sometimes, when there was a good song, I heard, ‘what a great taste in music’, and then, you feel as though you are credited” (Interviewee IX).

While there were those changing songs or volume as a means to adjust to customers or based on their own preferences, there were also others who did not. There is thus a divide between employees engaging in skipping songs and increasing volume and those not adjusting the music under any circumstance, not for customers or for their own preferences. This phenomenon links back to how some employees tended to block the music they did not like, which was their way of reacting to music, rather than their actual opinions about the music. However, this behavior also meant that they did not try to change the music to adjust to customers, and as stated above, they also preferred playlists that were constructed by someone else.

5. Discussion

Studies in psychology have shown that individuals often convey who they are with the music that they listen to and that they also use music preferences to evaluate other individuals (Rentfrow & Gosling, 2006). The results of such studies imply that business owners might also use in-store music

to communicate their brand values and therefore increase sales and customer satisfaction (Beverland et al., 2006). Consequently, the effect of in-store music on consumer behavior has attracted much attention in the marketing literature (Hargreaves and North, 1997; Kellaris, 2008; and Yorkston, 2010).

However, remarkably few studies have taken an interest in how in-store music is related to employees and whether it is beneficial to give them more discretion regarding the choice of background music in stores. This lack of research is puzzling considering that music is of such central importance for many individuals, suggesting that in-store music might have a major influence on the well-being of employees. Increased opportunities for employees to influence in-store music could, for example, make them more satisfied and service oriented, thus increasing customer satisfaction and sales. On the other hand, employees might choose music that is based on their own preferences rather than what is optimal for the store, suggesting that store owners may want to limit the opportunities for employees to influence the music played in stores.

Our study is the first large-scale experiment on whether increased opportunities for employees to influence in-store music affect sales. Most previous studies on the effects of in-store music are based on very limited samples; in contrast, we have studied eight Filippa K stores in Stockholm, Sweden, for 78 weeks (56 experiment weeks and 22 pre-experiment weeks). The stores were randomly selected into a treatment group and a control group, with the employees in the treatment stores having the opportunity to influence the in-store music using an app developed by SYB. The employees in the control stores had no such opportunities.

The results from our field experiment are disappointing for those who believe that employees should have more discretion to choose in-store music. Sales in the treatment stores decreased by, on average, 6% when employees had increased opportunities to influence the in-store music. We also performed placebo tests by randomly assigning treatment to what were in fact nontreatment time periods. None of the estimated treatment effects were statistically significant in this case, which further strengthens the proposition that the observed negative effects on sales were due to the increased opportunities for employees to choose the in-store music.

To gain a deeper understanding of our results, we also interviewed thirteen employees in the treatment stores. The interviews showed that the music preferences of the employees were diverse and, in most cases, not congruent with the brand values of the company. We believe that this implies an increased risk; that is, employees choose background music that is not optimal for the store. The interviews also conveyed that the employees used their opportunity to influence the in-store music by, for example,

changing the intensity of the songs. Here, we find that the employees tended to prefer high-intensity songs at a high volume, although previous research has shown that high-intensity songs at a high volume might decrease both the time spent in stores and sales.

The employees largely rationalized their choice to affect the music by pointing out how the music was changed to fit customers and was also adjusted in different parts of the store (such as a higher volume near the fitting rooms). While such rationalization is shown and in many cases follows the results of previous studies (such as a higher intensity if the store is more crowded; e.g., Garlin & Owen, 2006; Knoeferle et al., 2017), the interviews also point out a tendency to avoid low-intensity music, although such music may have fitted the time of day or the number of customers in the store. Adjusting music to fit customer preferences rather than the store image was also shown in the interviews and was manifested in statements about how the employees liked when customers recognized their choice of music, with the risk that the music choice (adjusting volume, skipping songs, sharing music, and choosing intensity) may be self-fulfilling rather than based on what would be best for the store. While previous research has indicated how familiarity and preference positively affect benevolence, the interviews seem to imply how customers should be positively surprised by the chosen music. The interviews indicate how the employees' preferences for up-tempo music and their beliefs regarding customer preferences guided the music in store, which at times led to different choices with regard to music that fitted the store image or even the time of day or the number of customers in the store. Based on how sales fell and from the behaviors indicated by the interviews, it can be assumed that brand image is more important for sales than employee satisfaction (Sundstrom & Sundstrom, 1986).

As always in field experiments, we cannot conclude that the results would hold under other conditions. The effects when employees have increased opportunities to choose in-store music might thus be different in another store environment and with other employees, and any interpretation of our results outside the specific experiment should be done with caution. We therefore believe that more research is needed to validate whether our results also hold in other contexts. There is also a lack of knowledge in general regarding the interaction effects between in-store music and the well-being of employees, which we believe constitutes an interesting area for further research. Repeated experiments in other types of stores (low-cost, other types of items sold, service stores) and workplaces would be interesting to see whether the relationship among in-store music, employees and sales varies with the store environment. In the experiment, we found differences in the results depending on whether customers were shopping for men's or women's clothing. It would be interesting to further study gender aspects, including in relation to employee gender.

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References

Abadie, A. (2005). Semiparametric difference-in-differences estimators. Review of Economic Studies, 72(1), 1–19.

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.

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(1), 336-340.

Baker, J., Parasuraman, A., Grewal, D., & Voss, G. B. (2002). The Influence of Multiple Store Environment Cues on Perceived Merchandise Value and Patronage Intentions. Journal of Marketing, 66, 120-141.

Beverland, M., Lim, E. A. C., Morrison, M., & Terziovski, M. (2006). In-store music and consumer–brand relationships: Relational transformation following experiences of (mis) fit. Journal of Business Research, 59(9), 982-989.

Biswas, D., Labrecque, L. I., Lehmann, D. R., Markos, E., , -. o. o. a., & , p.-. (2014). Making Choices While Smelling, Tasting, and Listening: The Role of Sensory (Dis)similarity When Sequentially Sampling Products. Journal of Marketing, 78(1), 112-126.

Bitner, M. J. (1992). Servicescapes: The Impact of Physical Surroundings on Customers and Employees. Journal of Marketing, 56, 57-71.

Bruner, G. C. (1990). Music, mood, and marketing. Journal of Marketing, 54(4), 94-104.

Daunfeldt, S-O., Rudholm, N., & Poppius, H. (2017). Effects of Brand-Fit Music on Consumer Behavior: A Field Experiment. HUI Working Paper No.121, HUI Research: Stockholm.

Duflo, E., Glennerster, R., & Kremer, M. (2007). Using randomization in development economics research: A toolkit. Handbook of Development Economics, 4, 3895-3962.

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.

Hargreaves, D.J. & North, A.C. (1997). The social psychology of music. I Hargreaves, D. J., & North, A.C. (eds), The social psychology of music. Oxford University Press, 1-24.

Helmefalk, M. (2017). Multi-sensory cues in interplay and congruency in a retail store context: Consumer emotions and purchase behaviors. (Doctoral), Växjö.

Hui, M. K., Dubé, L., & Chebat, J.-C. (1997). The Impact of Music on Consumers' Reactions to Waiting for Services. Journal of Retailing, 73(1), 87-104.

Kellaris, J. J. (2008). Music and consumers. In C. P. Haugtvedt, P. M. Herr, & F. R. Kardes (Eds.), *Handbook of consumer psychology* (s. 837–856). New York: Taylor & Francis Group/Lawrence Erlbaum Associates.

Kniffin, K. M., Yan, J., Wansink, B., & Schulze, W. D. (2017). The sound of cooperation: Musical influences on cooperative behavior. Journal of Organizational Behavior, 38(3), 372-390.

Knoeferle, K. M., Paus, V. C., & Vossen, A. (2017). An upbeat crowd: fast in-store music alleviates negative effects of high social density on customers' spending. Journal of Retailing, 93(4), 541-549.

Korczynski, M. (2003). Music at work: Towards a historical overview. Folk Music Journal, 8, 314-334.

Krueger, A. B. (1999). Experimental estimates of education production functions. The Quarterly Journal of Economics, *114*(2), 497-532.

Levy, M., & Grewal, D. (1993). An experimental approach to making retail store environmental decisions. Journal of Retailing, 68(4), 445-460.

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.

Mari, M., & Poggesi, S. (2013). Servicescape cues and customer behavior: a systematic literature review and research agenda. Service Industries Journal, 33(2), 171-199.

Mattila, A., & Wirtz, J. (2001). Congruency of scent and music as a driver of in-store evaluations and behavior. Journal of Retailing, 77(2), 273-289.

Milliman, R. (1982). Using Background Music to Affect the Behavior of Supermarket Shoppers. Journal of Marketing, 46, 86.91.

Milliman, R. (1986). The Influence of Background Music on the Behavior of Restaurant Patrons,. Journal of Consumer Research, 13, 286-289.

Morin, S., Dube, L., & Chebat, J.-C. (2007). The role of pleasant music in servicescapes: A test of the dual model of environmental perception. Journal of Retailing, 83(1), 115-130.

Morrison, M., Gan, S., Dubelaar, C., & Oppewal, H. (2011). In-store music and aroma influences on shopper behavior and satisfaction. Journal of Business Research, 64(6), 558-564.

North, A.C. and Hargreaves, D.J. (1996). The effects of music on responses to a dining area. Journal of Environmental Psychology, 16, 55–64.

North, A. C., Hargreaves, D. J., & McKendrick, J. (1999). The influence of in-store music on wine selections. Journal of Applied Psychology, 84(2), 271.

Oakes, S. (2003). Musical tempo and waiting perceptions. Psychology & Marketing, 20(8), 685-705.

Rentfrow, P. J., & Gosling, S. D. (2006). Message in a ballad: The role of music preferences in interpersonal perception. Psychological Science, 17(3), 236-242.

Shih, Y. N., Huang, R. H., & Chiang, H. Y. (2012). Background music: Effects on attention performance. Work, 42(4), 573-578.

Skandrani, H., Dahmane Mouelhi, N. B., & Malek, F. (2011). Effect of store atmospherics on employees' reactions. International Journal of Retail & Distribution Management., 39(1), 51-67.

Sundstrom, E., & Sundstrom, M. G. (1986). Work Places: The Psychology of the Physical Environment in Offices and Factories. Cambridge: Cambridge University Press.

Turley, L., & Milliman, R. (2000). Atmospheric effects on shopping behavior: A review of the experimental evidence. Journal of Business Research, 49(2), 193-211.

Wilson, S. (2003). The effect of music on perceived atmosphere and purchase intentions in a restaurant. Psychology of Music, 31(1), 93-112.

Yalch, R., & Spangenberg, E. (1990). Effects of store music on shopping behavior. Journal of Consumer Marketing, 7(2), 55-63.

Yorkston, E. (2010). Auxilary auditory ambitions: Assesing ancillary and ambient sounds. I Khrisna, A (ed). *Sensory marketing: Research in the sensuality of products*. Taylor & Francis: New York, s. 157-167.

Appendix 1: Pretreatment trends

As mentioned in the main text of our paper, identification in difference-in-differences regression models assumes that intervention and control group stores would have had similar trends in the outcome variables in the absence of treatment. Of course, such trends are impossible to empirically observe since a store that receives the intervention cannot then also be observed in the counterfactual state of not having received that intervention. Instead, most researchers plot pretreatment trends in the outcome variable to gain an idea of how plausible the identification assumption is in the case at hand. In the main part of the paper, we presented these trends for all sales, while we present the pretreatment trends in an average daily sales index divided into women's and men's clothing below.

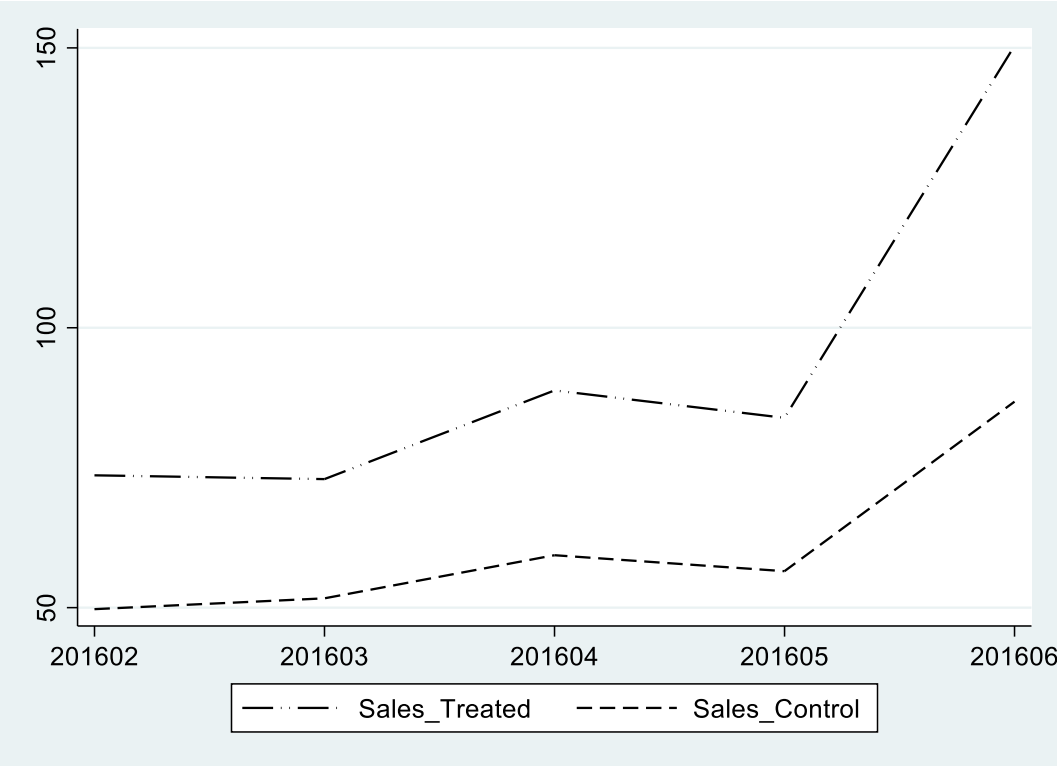

Figure A1:2. Pretreatment trends of the women's clothing sales index.

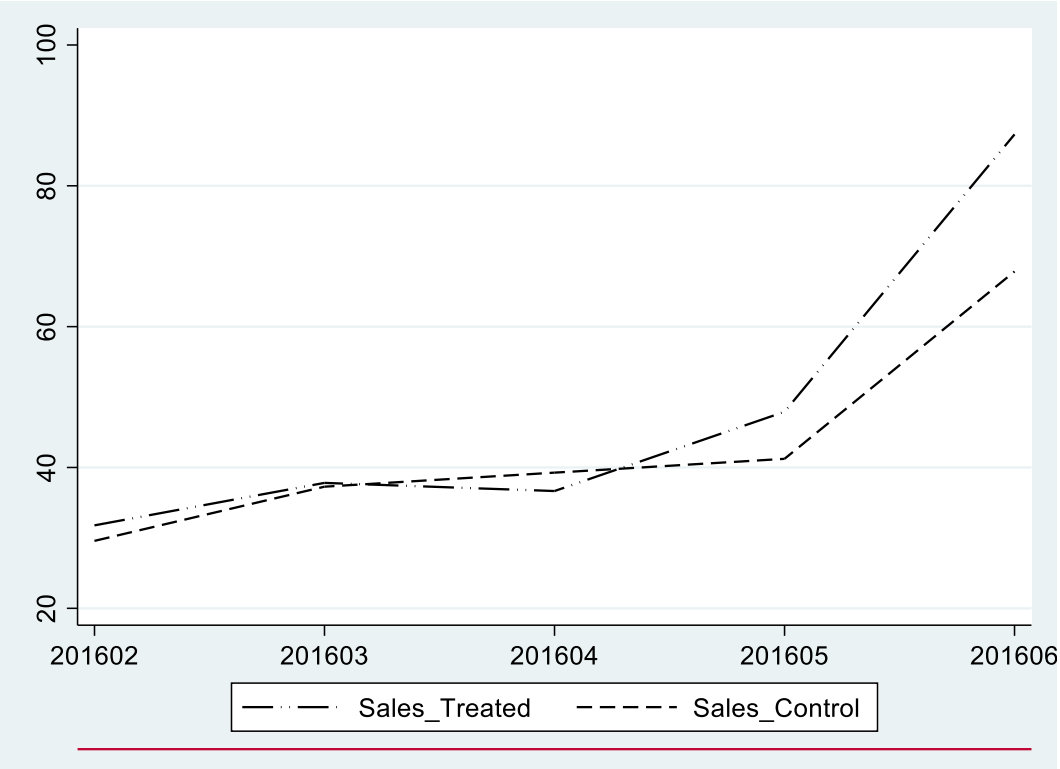

Figure A1:3. Pretreatment trends of the men's clothing sales index.

Appendix 2. Timing of the effects.

To investigate whether the effects are immediate when the treatment is given and constant over time, we also estimated equation (1) but restricted the length of the treatment period to continue to 161001, 161201, 170201 and 170801 (where this last one is the whole period and where the results thus coincide with those presented in Table 2 in the main text of the paper). As shown by these additional estimations, the effects appear within three months after the change in store environment and are fairly constant during the period under study.

Table A3:1. Estimation results. The treatment period ends at different points in time, the dependent variable *ln Sales*$_{i,t}$.

	Total sales				Women's clothing				Men's clothing			
	161001	161201	170201	170801	161001	161201	170201	170801	161001	161201	170201	170801
$tp_t \times tg_i$	-0.04	-0.06	-0.05	-0.06*	-0.12*	-0.15***	-0.11**	-0.11**	0.09	0.03	-0.01	-0.06
	(0.05)	(0.05)	(0.04)	(0.04)	(0.06)	(0.06)	(0.05)	(0.05)	(0.07)	(0.06)	(0.06)	(0.05)
Store f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,092	2,624	3,065	4,626	1,655	2,077	2,427	3,665	1,586	1,985	2,322	3,511
R-squared	0.64	0.64	0.65	0.65	0.58	0.57	0.61	0.59	0.64	0.64	0.65	0.63

Note: *** statistically significant at the 1% level; ** statistically significant at the 5% level; * statistically significant at the 10% level. Heteroskedasticity robust standard errors are in parentheses. Store f.e. indicates that the regression is performed using store-specific fixed effects, while Date f.e. indicates that date-specific fixed effects are used.

Appendix 3. Interview guide.

Staff

1. Gender
2. Age
3. What is your role, and how long have you worked here?
4. Describe how you listen to music as a private person. What type of music? When? How often? What is the role of music in your everyday life?

The store atmosphere

1. Describe your thoughts on the music that has been played in this store since July last year to today's date.
2. How do you think the music matches the Filippa K brand? Why? Why not?
3. What type of music would you say matches the Filippa K brand? Why?
4. Do you consider that music at work affects your motivation and productivity? Describe how.
5. Have you heard any feedback from customers regarding the music? If yes, provide examples.
6. How important do you think the music is in affecting customers? In what way?
7. If you could influence/change one thing about the music played, what would it be?

The music

1. How would you describe your ability to affect your work place generally? Does the staff remote have a role in this? How?
2. Do you feel that you are/have been able to influence the music in this store?
3. Would you like to be able to influence the music in your work place? If yes, why? Additionally, how would you want to do it? If no, why not?

Spotify remote

1. You have been able to influence the music in this store by changing songs and adjusting the intensity and the volume by means of the Spotify Remote on the iPad. Could you tell us your experiences with this?
2. In what situations did you use the staff remote to skip songs? Give a few examples. Why? What did you want to accomplish? (Did you dislike the song or think the music was repetitive?) What exactly did you do? What was the effect?
3. In what situations did you use the staff remote to increase/decrease the music intensity? Give a few examples. Why? What did you want to accomplish? What exactly did you do? What was the effect?
4. In what situations did you use the staff remote to increase/decrease the volume? Give a few examples. Why? What did you want to accomplish? What exactly did you do? What was the effect?
5. Did you experience the music to be repetitive at any point? Please discuss. How did it affect you? How did it affect the customers? Did you do something about the situation? What?
6. How did you feel about different music intensities? What fits best with the store/brand? What have you liked the best? What type of intensity do you think best matches the store/Filippa K?
7. Did you find the staff remote easy to use? If yes, why? If no, why not?
8. Do you think that the staff remote was important for your ability to affect the music in the store? If yes, how and why? If no, how and why not?
9. Do you consider the staff remote to be a useful tool for affecting the music in the store? If yes, how and why? If no, how and why not?
10. What do you think about the design of the staff remote? I like i, because… (please tell why). I do not like it because… (please tell why not).
11. What do you think about the existing features of the staff remote?
12. If you had been able to choose freely, would this service/product ease your work? Energy level, volume, music style, influence favorites and nonfavorites, play a song less/more

13. Do you have additional feedback on the staff remote?