

Do store flyers trigger cross-category sales? The moderating role of categories' relatedness

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Abstract:

This study investigates the impact of featuring product categories in a store flyer on cross-category sales and explores how this effect is moderated by the degree of relatedness between the featured categories and other categories. The authors analyze the cross-sales effects of eight departments and 45 categories for a durable goods retailer in The Netherlands over 52 weeks. The empirical results indicate that there is an overall negative cross-sales flyer effect at the department level, while the effect at the category level is non-significant. Yet, this cross-category sales effect of the store flyer varies substantially across several category relatedness constructs. More specifically, the degree of complementarity between categories, the similarity between categories in terms of the degree of hedonism and the distance between categories in the store have a significant positive impact on the cross-category sales flyer effect.

Keywords: Store flyer effectiveness, Category relatedness, Cross-sales effect

Track: Retailing & omni-channel management

1. Introduction

Store flyers can be defined as printed materials sent by retailers via post to inform individual consumers about the deals and variety present in their store assortment (Pieters, Wedel, & Zhang, 2007). Store flyers are a key marketing instrument for retailers, even in the digital age (Ziliani & Ieva, 2015), accounting for over 50% of retailers' marketing budget (Gázquez-Abad and Martínez-López 2016). In other European countries like Belgium, 9 in 10 customers read store flyers, spending almost 20 minutes on average every week checking flyers (Bloovi, 2018).

Retailers use store flyers to communicate to customers on (part of) their assortment and promotions, and thereby hope to attract customers to visit the store. The ultimate goal of featuring categories in a store flyer is to not only encourage consumers to buy (some of) the featured items (Blattberg & Neslin, 1990), but to also stimulate consumers to extend their purchases beyond the categories promoted in the store flyers.

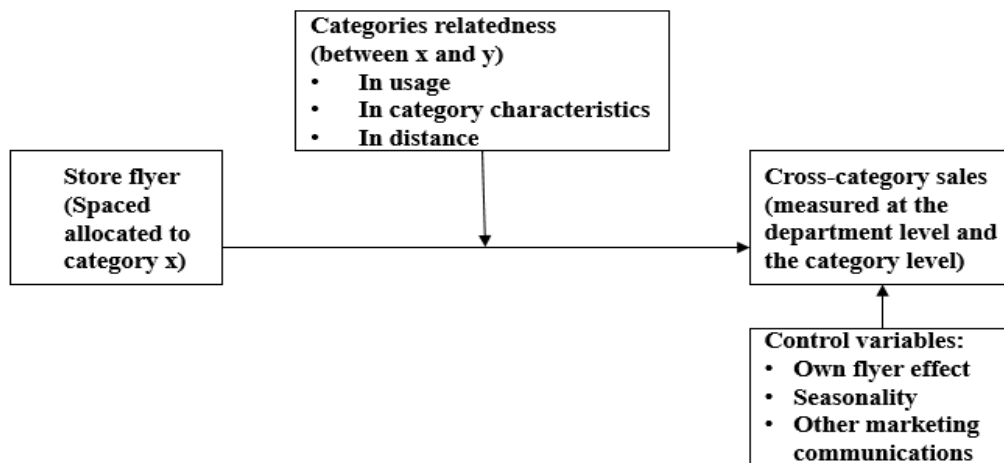
The possibility that featuring categories in a store flyer creates a sales spillover in other categories has important implications for the retail managers since they would want to allocate the scarce space within a store flyer to the categories that trigger highest own- and cross-category sales. Thus, it is interesting to investigate the own- and cross-category sales impact of featuring categories in a store flyer. While the own-category sales impact of store flyers has been shown by prior literature in the past (Gázquez-Abad & Martínez-López, 2016; Gijssbrechts, Campo, & Goossens, 2003), we are one of the first to do an extensive study on the cross-category sales impact of featuring categories in a store flyer.

In addition to investigating the overall cross-category impact of store flyers, we explore how the relatedness between pairs of (featured and other) categories explains differences in cross-sales effects. Previous studies, in the context of sales promotion, have demonstrated that the strength of linkages between brands or categories is a good predictor of the magnitude of sales spillover (Leeflang and Parreño-Selva 2012). Following prior literature, we propose that categories can be related via: i) similarity in usage (degree of complementarity and degree of substitution), ii) similarity in category characteristics (such as the level of involvement or the degree of hedonism/utilitarianism), and iii) physical proximity (distance between categories in the store) (Leeflang and Parreño-Selva 2012; Sahni 2016).

Our objective is thus to investigate the main effects of featuring categories in a store flyer on cross-category sales, and explore the moderating impact of category relatedness. We investigate cross-sales effects of store flyers at two levels in the hierarchy, namely the department level (where departments are defined as large groups of categories, like kitchen and

bathroom) and the category level (which is a subdivision of items/SKUs in a department like kitchen appliances, and kitchen taps & sinks as two categories in the kitchen department).

Figure 1- Conceptual framework



2. Theoretical background

2.1 Cross-sales impact of featuring categories in a store flyer

Direct marketing literature has shown that a store flyer has a positive impact on both store traffic (Gijbrecchts et al., 2003; Gázquez-Abad and Martínez-Lopez, 2016). Given that consumers oftentimes buy multiple categories during one shopping trip (Sahni, 2016), it is not unlikely that consumers – once they are in the store – end up buying not only featured categories but spend money on other categories as well (Leeflang and Parreño-Selva, 2012). Additionally, according to the associative network theory (Collins and Loftus, 1975), being exposed to advertisements, such as a featured product in a store flyer, may not only evoke memories associated with the advertised category but can also remind consumers of other related options which might cause the consumer to consider them for purchase along with the advertised one (Sahni, 2016).

On the other hand, and according to mental accounting theory (Thaler, 1985), consumers allocate budget limits that they can spend across various categories in their minds. When consumers face a binding budget constraint on a shopping trip, an increase in the amount spent for a product category featured in a store flyer (on a given shopping trip) would decrease the amount that is perceived to be available to spend on other categories, producing potential negative cross-sales effects.

2.2 Moderation effect of category relatedness a store flyer

According to the accessibility-diagnostics framework of Feldman and Lynch (1988), the transfer of information of a cue pertaining to one category (such as the information coming

from featuring a category in a store flyer) to another category depends on the nature and the strength of the link between the two categories (accessibility) (Kushwaha & Shankar, 2013). Stated differently, featuring a category in a store flyer is more diagnostic for other categories when the associations between the two categories is higher (higher accessibility).

Prior research on cross-category interdependencies and brand extensions (Aaker and Keller 1990; Lei et al. 2008) and on scandal spillovers (Roehm and Tybout 2006; Borah and Tellis, 2016) suggest various dimensions of relatedness between two categories. In particular, based on this literature, we focus on three dimensions of category relatedness that could influence the degree of cross-sales flyer effects: (i) the extent to which the categories are related in usage, (ii) the similarity between categories based on an overlap in category characteristics, and (iii) the physical distance between categories in a store.

3. Empirical setting and data

In this study we use a unique scanner weekly sales dataset from a large independent retailer in The Netherlands, with a single store of more than 22,000 m² surface area and around 300,000 visitors in a year. The retailer has a large variety of categories within eight departments: living room & home decoration, lightening, kitchen, bathroom, household appliances, outdoor, Do-It-Yourself (DIY) and professional construction. We follow the retailer's classification of departments and categories. This categorization is aligned with what is common practice at similar businesses in the sector.

The retailer's main marketing communications are door-to-door specialist flyers (65% of all direct marketing communications), where two or three departments are featured per flyer and the retailer wants to convey the message that they are a specialist in the featured departments (they label their flyers as 'specialist in departments x and y'). On average 130,000 copies are distributed each time. The specialist flyer normally consists of four or eight pages and comes in tabloid size (289 x 415 mm). During the one-year time span that we investigate (52 weeks in 2018), the company sent a door-to-door specialist flyer seventeen times. In total, of the eight departments, five departments were featured at least once, and of the 45 categories, fourteen categories are featured at least once in the flyers. Categories that are featured in the specialist door-to-door flyer are accompanied by a sales promotion 32% of times, with an average promotion depth (discount percentage) of .26.

4. Model

In line with Gielens (2012) and Datta, Ailawadi, and Van Heerde (2017), we use a two-stage model. In the first stage, we model the cross-sales flyer effects for each pair (either two departments for the department-level model, or two categories for the category-level model).

Then, in the second stage, we extract the estimated cross-sales flyer coefficients from the first stage and use them as dependent variables to explore the impact of the relatedness between pairs. We also do this analyses twice, once on the cross-department flyer coefficients and once on the cross-category flyer coefficients.

4.1 First-stage models

4.1.1 Department-level model

Given that there are eight departments, we estimate eight sales response models with the log of the sales of department j at week t , $t = 1, \dots, T$, as the dependent variables. We take the logarithm to reduce skewedness and improve the fit by making the variable more “normally” distributed, which is a common practice in marketing (Ataman, Van Heerde, & Mela, 2010).

We use a regression model with the following equation:

$$\begin{aligned}
 I) \text{LnSales}_{jt} = & \beta_{j0} + \left(\sum_{k=1}^{k=n} \beta_{j1k} \text{Crossdep_flyer}_{kt} \right) + \beta_{j2} \text{Own_flyer}_{jt} \\
 & + \beta_{j3} \text{Holiday_period}_t + \beta_{j4} \text{Closure_day}_t + \left(\sum_{Q=2}^{Q=4} \beta_{j5,Q} \text{Quarter_dummy}_t \right) \\
 & + \beta_{j6} \text{Two_Specialist}_{jt} + \beta_{j7} \text{Other_Marketing_Actions}_{jt} \\
 & + \left(\sum_{k=1}^{k=m} \beta_{j8k} \text{Copula_Crossdep_flyer}_k \right) + \beta_{j9} \text{Copula_Own_flyer}_j + \epsilon_j.
 \end{aligned}$$

$\text{Crossdep_flyer}_{kt}$ is the share in a flyer in week t for each of the other departments k ($k=1$ to m , with $k \neq j$) and Own_flyer_{jt} is the share of the focal department j in the flyer in week t . We use the share allocated to each department in the whole flyer space (which is a value between zero and one) as the focal independent variable, following Gijbrecchts et al. (2003) as this better captures the intensity and salience of a department in the flyer. In addition, we include a dummy $\text{Two_Specialist}_{jt}$, which takes a value of one when there are two specialist flyers active for department j in week t , and control for other marketing communication activities, whether the week is in a holiday period or contains a closure day as well as for the quarter of the year. We also need to control for the endogeneity of the own-department and cross-department flyer share variables as the decision of a retailer to feature certain departments in a given week is not random. To do so, we rely on an instrument-free method using Gaussian copulas, which was introduced by Park and Gupta (2012).

4.1.2 Category-level model

Next to the department-level model, we estimate a category-level model within each department. In particular, we model category i 's log of sales at week t , $t = 1, \dots, T$ as a function of cross-category flyer share, where we limit the effects to categories within the same department and use a similar model as in Equation I but adapted to the category level. We kept

in the control variables and additionally added the cross-department share as a control variable. We estimate one sales response model for every category within the five departments that were featured in the flyers (there are no cross-sales effects of store flyers at the category level for the three departments that were never featured). In total, we estimate 25 regressions (four for living room, four for lightening, three for kitchen, six for outdoor and eight for DIY).

4.2 Second-stage estimations

The first-stage models yield 35 cross-sales flyer effects at the department level and 63 cross-sales flyer effects at the category level. To investigate the moderating impact of relatedness on these cross-sales effects of flyers, we regress the coefficients of the cross-sales flyer effects extracted from the first-stage department-level estimations, as well as the cross-sales flyer effects extracted from the first-stage category-level estimations, as a function of the five different relatedness types that we identified previously. Because the dependent variables in the second-stage Equations I and II are estimated parameters, we use weighted least squares (WLS), with the inverse of the dependent variables' standard error as weights (Lewis & Linzer, 2005). The second-stage model for the department level can be written as follows:

$$II) \beta_{k \text{ on } j} = \beta_0 + \beta_1 \text{Complementarity}_{j \text{ and } k} + \beta_2 \text{Substitution}_{j \text{ and } k} + \beta_3 \text{Hedonic}_{j \text{ and } k} \\ + \beta_4 \text{Involvement}_{j \text{ and } k} + \beta_5 \text{Distance}_{j \text{ and } k}$$

where $\beta_{k \text{ on } j}$ is the coefficient of the cross-sales impact of department k 's flyer ($k=1$ to m , with $k \neq j$) on department j 's sales, $\text{Complementarity}_{j \text{ and } k}$ is the degree of complementarity between departments j and k , $\text{Substitution}_{j \text{ and } k}$ is the degree of substitution between departments j and k , $\text{Hedonic}_{j \text{ and } k}$ is the absolute difference between the level of hedonism of departments j and k , $\text{Involvement}_{j \text{ and } k}$ is the absolute difference in the level of involvement between departments j and k and finally, $\text{Distance}_{j \text{ and } k}$ is the physical distance between the (center) of departments j and k in the store. The second stage model for the category level looks similar but uses pairs of categories (rather than departments), plus additionally controls for the fact that estimated cross-sales flyer coefficients at the category level come from different departments with different effect sizes via a department dummy.

For measuring the relatedness in usage and category characteristics, we conducted a survey among 33 end consumers (judgement sample) and asked them to rate the relatedness in usage (for a pair), as well as provide a score on hedonism and involvement (that are used to assess the relatedness in category characteristics for a pair). In order to calculate the distance between pairs of departments or pairs of categories within a department, we calculate the

Euclidean distance between each pair. Euclidean distance is one of the most common constructs to measure distance between items in a store (Zhao, Zhou, & Wahab, 2016).

5. Estimation results

5.1 First-stage estimation results

In the first stage, we estimated a sales model for each department and also one for each category, as discussed in the method section. As the number of sales models estimated is huge, we do not report and discuss the results of each model separately. Instead, to test whether the coefficients of cross-sales flyer effects as well as control variables (including the own flyer effect) are significantly different from zero across all first-stage estimations, the added Zs method is used (Rosenthal 1991). According to Table 1, the sales effect of the cross-category flyer share at the category-level model is not significant ($Z - value_{crosscat_flyer} = -1.32, p = .19$). However, the significant negative Z-value of the sales effect of the cross-department flyer share, both at the department- and category-level model, confirms that cross-flyer effects between departments are negative ($Z - value_{crossdep_flyer} = -2.74, p < .01$ at department-level model and $Z - value_{crossdep_flyer} = -4.2, p < .01$ at category-level model). We thus find evidence for negative cross-sales effects of featuring departments in the flyer and no significant cross-sales effects of featuring categories in the flyer.

Table 1- First-stage estimation results (at department and category level)

Variable	Department-level model		Category-level model	
	Rosenthal Z-value	p value	Rosenthal Z-value	p value
Constant	19.8	<.01***	38.72	<.01***
Cross-category flyer share	N.A.	N.A.	-1.32	0.19
Cross-department flyer share	-2.74	0.01**	-4.20	<.01***
Own flyer share	0.82	0.20	1.62	0.05**
Holiday period	3.66	<.01***	5.60	<.01***
Closure day	-2.32	0.01**	-4.26	<.01***
Two specialist flyer	1.58	0.06*	1.57	0.06*
Other marketing actions	1.84	0.03**	1.91	0.03**
q2	2.13	0.03**	2.01	0.04**
q3	1	0.32	-0.45	0.65
q4	1.59	0.11*	0.64	0.52
Copula Own flyer share	-1.28	0.10	0.96	0.33
Copula Cross-category flyer	N.A.	N.A.	-0.71	0.48
Copula Cross-department flyer	-4.34	<.01***	-1.41	.15

$p < .1 = *$, $p < .05 = **$ and $p < .01 = ***$; We report one-sided p-values for the variables for which we have clear expectations on their direction (own flyer share, Holiday period, Closure day, Two specialist and Other marketing actions) and two-sided p-values for the rest of variables.

5.2 Second-stage estimation results

Table 2 presents the result of the second-stage model, at the department level (left panel) and at the category level (right panel). At the department level, we do not find a significant

effect of the relatedness measures, except for the degree of complementarity between the departments that is positive and marginally significant ($\beta=.07$, $p=.09$). This implies that we find small evidence that the relatedness of departments has an impact at the department level.

Unlike the department-level results, the results from the second-stage analysis on the cross-sales effects of featuring categories in-store flyers suggest moderating roles of the relatedness between two categories. So, even though there is no significant main effect of the cross-category flyer share variable on category sales as was suggested by the first-stage model, the effects seem to strongly differ depending on the relatedness. First, similar as what we find at the department-level model, the degree of complementarity has a positive and significant impact on the cross-category sales effects of store flyers ($\beta=1.79$, $p=.01$), while the degree of substitution does not have a significant effect ($\beta=-.32$, $p=.33$). Second, the similarity on the hedonism level between two categories has the expected negative impact on cross-category sales effects of flyers ($\beta=-1.23$, $p<.01$). Lastly, the distance between the two categories has an expected significant negative effect on the cross-category sales effect of store flyers ($\beta=-.05$, $p<.01$). Hence, the higher (smaller) the distance between two categories within a department, the more negative (positive) the cross-category sales effect of store flyers.

Table 2-Second-stage estimation results at the department/ category level

Variables		Department level model			Category level model		
		Coef.	SE	P-value	Coef.	SE	P-value
Similarity in usage	Complementarity	0.07	0.05	0.09*	1.79	0.46	<.01***
	Substitution	-0.04	0.13	0.38	-0.32	0.69	0..33
Similarity in category characteristics	Hedonic	0.03	0.08	0.35	-1.23	0.39	<.01***
	Involvement	0.08	0.06	0.1	4.76	0.88	<.01***
Similarity in location	Distance	0.002	0	0.25	-0.05	0.02	<.01***
Control variables	Department 1				0.96	2.3	0.68
	Department 2				-1.15	3.19	0.72
	Department 3				-17.16	6.49	0.01**
	Department 4				6.07	2.14	0.01**
	Constant	0.14	0.47	0.77	-10.47	3.42	<.01***

p<.1=, p<.05=** and p<.01=***; we report one-sided p-values for the variables for which we have clear expectations on their direction and two-sided p-values for the rest of variables.*

6. Discussion and managerial implications

This study provides empirical evidence of the cross-sales effects of featuring categories in a store flyer and illustrates how such effects can be moderated by category relatedness. Although there has been research on the own-category sales impact of categories featured in a store flyer (Gijbrecchts, Campo, and Goossens 2003; Gázquez-Abad and Martínez-López 2016), this study is the first to show the cross-category impact of the content of direct marketing communication. Our results confirm the existence of overall negative cross-sales flyer effects

at the department level. We find that featuring a department in a store flyer negatively influences the sales of other departments. This negative cross-department sales effect of store flyers can be explained by mental accounting theory (Thaler, 1985). According to this theory, consumers have a budget limit for various concepts in their minds. Once consumers spend the money allocated to a department (in our case, the one that is featured in the store flyer), they trespass the budget allocated for that specific shopping trip and underspend in other departments as a result.

In contrast to the department-level results, we did not find the overall negative cross-category sales effect of store flyers. The absence of significant cross-category sales effects may be due to the fact that there are important differences across categories. Indeed, we found that several category relatedness constructs are exerting a significant impact on cross-category sales. In particular, our results show that the degree of complementarity between categories has a significant positive impact on the cross-sales flyer effect. What is more, we found that the higher the similarity on degree of hedonism between featured and other categories, the more positive the sales spillover to other categories, in line with the accessibility-diagnostics framework (Feldman and Lynch 1988). In contrast, similarity between categories in the level of involvement exerts a negative effect on cross-sales flyer effects at the category level. Finally, our study illustrates that distance between categories in the store is an important source of cross-sales flyer effects. More specifically, the more positive cross-sales flyer effects are found for categories that are located closer in the store to the featured categories.

The findings from our study provide valuable insights for retailers. We empirically show that the cross-sales effect of featuring a category in a store flyer is an important antecedent of store flyer performance, which retailers should not ignore. We also provide evidence for the fact that the effectiveness of store flyers can be improved by taking into account the degree of relatedness between the featured categories and other categories. More specifically, our results indicate that a retailer manager can improve the impact of store flyers on sales by featuring the categories that are more related in terms of complementarity, more similar in level of hedonism and more closely located to other categories. To pursue this goal, managers may want to deliberately identify the groups of categories that are complements and similar in level of hedonism.

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